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Research on Model Designinig Process Education by Interactive Methods

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Astract.

In product design education, it is necessary to design the existing modeling method considering the possibility that the problem in interaction between other people and product occurs in all kinds of places. As a preliminary investigation, we thought that we might be able to offer new value after interactive methods practical using." Consider the user when devising methods of gathering and providing information", "Make it a seemingly everyday product that gets people excited when displaying information", and "Figure out how to prevent the user from becoming overly passive toward the product" were the three points given attention during development. In addition, we made a travel map by contrasting my experience by conducting a hearing survey to find out what the student's work is, which is struggling in writing and hard work in modeling. The purpose of this study is to establish a foundation through modeling support materials, to challenge free molding, to raise awareness of modeling, and to improve the formative power.

Keywords: Active Learning, Interactive Method, Modeling Skill, Design Process

1   Introduction

In recent years, a technology called the ICT (Information and Communication Technology), which allows the connection of Many products and environment etc. to a network, has been growing. It is conceivable that a

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significant change in people's everyday life will take place as the sphere of ICT continues to expand. However, due to the rapid nature of this expansion and the successive birth of new concepts it causes, the meaning of ICT within the field of product design is varied. That's meaning is used much as interactive methods. There are measuring of human behaviors, connecting that collection of data to the network, and then analyzing much of that information. However, collection of unrelated information may cause obstacles in product design. It is for this reason that a focus on information automatically gathered by the product without any serious consideration of the human conduct is a problem. It is also important to educate the design of the product by actively acting in consideration of human behavior and thinking, rather than providing one-sided information. It is also possible to imagine that problems in the interaction between people and the product which until now would have been inconceivable could arise in all kinds of places. We thought there we might be able to provide some new value We've seen after extensively examining the realm of interactive methods in this investigation. We found that I did not acquire the basics in the two years of model production from the students' awareness of model making. We can challenge free form in three years by using the support materials and solidifying the foundation at the second year. It is clear from the investigation of the point of failure that we are mainly focused on the understanding of ICT, interactive methods and 3D creation, and that we are designing the design to match the creation[1]. In order to raise awareness of the necessity of raising awareness of the need for mutual appreciation of the relationship between the model and the model. In this research, we clarify problems in model creation in design exercises, and based on the results, we will conduct research to support model creation so that students can express meaningful forms.

2   On Experiential Lessons in University Education

There is a difference in university education compared to high school, where students need active learning. Therefore, it is necessary to tell the students that the 'acquisition of freedom comes by thinking and imagination' at the scene of university education, and prepare an environment that maintains their high motivation[2]. Active learning has attracted attention in education over a wide range of specialized fields, helping students to create an environment that cultivates independence[3]. With active learning, educators shift from facilitating passive classes wherein teachers unilaterally communicate knowledge to places where students themselves actively learn. Specifically, in addition to listening in the classroom, faculty members engage in active tasks such as group discussions, presentations, and so on, and to think about the contents themselves. The visualization of ideas has a strong influence from concept planning to design creation as written in Figure 1. Interactive methods are especially important in the design of education, and this paper uses design practice as a case study. The exercise was designed to actively carry out a series of design processes as shown in the following figure, in individuals and in groups. By learning through design exercises, you can practically acquire abilities as a product designer. This is a way to try to acquire creative problem-solving skills and formative abilities regarding university educaton[4].
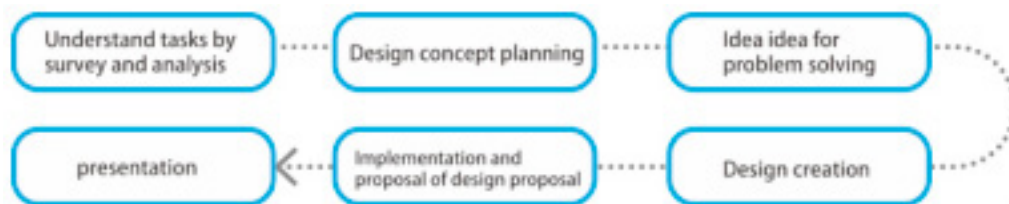

Fig.1 The process of Design Exercises Class

2.1   The importance of hands-on basic education in the design process

According to a study of the Learning Pyramid Model by the National Training Laboratories, active learning has a large effect on attitudes, such as attitude toward learning, comprehension of tasks, the establishment of long-term memory, positive attitude, and acquisition of self-confidence[5]. This study comprised a survey of seven different learning formats and examined the learning retention rate after semester years in class; in the lecture format, only about 5% of the contents were memorized, whereas in experiential learning, approximately 75% of the content was

learned[6]. In addition, the active learning that is being studied in the present university's exercise class is described below.

Fig.2 Learning Pyramid Model

As the above study indicates, practical learning is effective in the acquisition of creative problem-solving skills; visualization of ideas with students' own hands additionally helps them to hone a sense of shaping their own knowledge. To repeat, learning by experience effective. In the basic education of students who are trying to acquire shaping power, it becomes necessary to learn while feeling on the skin, especially by actually creating them with their own hands[7].

Table.1 Study of Active Learning in Exercise Class

Learning process	Method of improve the Quality of Learning			
	Higher order learning method	Strengthening the viewpoint of other companies	Support out-of-class learning	Curriculum support
Information gathering / interview · questionnaire · experiment / group discussion / group learning / presentation / teacher · question response with other students	Problem Discovery / Conception Method / How to organize thoughts / How to Summarize / Wheel · Method of Story Composition	In order to enable students to discuss among students outside the class, simulation that considers opponents who introduce / convey electronic media systems such as electronic bulletin boards and blogs	Electronic bulletin board, introduction of electronic media such as blog / learning support center 24 hours opening of organization / library, study room, laboratory etc.	Collaboration between first year subjects and higher grade PBL / Reconstruction of curriculum in cooperation with other specialized subjects

3   Survey and Results

3.1   The current investigation of students' model creation

As a result of observing the work of the third-year student and investigating what kind of shape it is, as a result, there was no one who challenged the form with a high level of difficulty because of the basic shaping.

Fig.3 Form of the Design of the parts

A questionnaire survey was then administered, covering the points that caused students to stumble during model creation. Because of a shortage of understanding at the material selection stage, and a lack of planning and basic technology at the preparatory stage, texture and design problems arose at the assembly stage. Therefore, it is clear that it is necessary to teach students basic techniques as well as finishing methods for model creation.
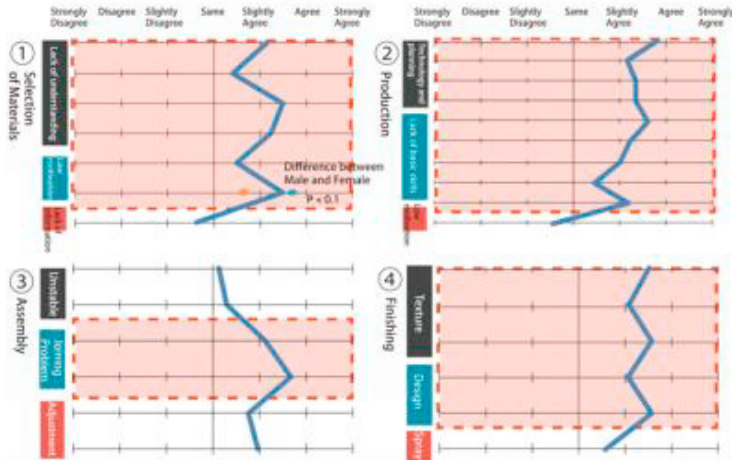

Fig.4 Stumbling point during modeling process

3.2   Survey on awareness of modelling

During design exercises, when We surveyed students to learn about design challenges, We found that we decided the shape to facilitate making 3D rendering and models.
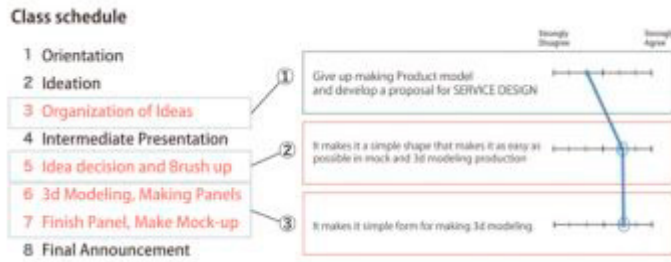

Fig.5 Points to stumble in class

In addition, in the survey that compares consciousness to model creation and 3D creation, results show that students considered 3D creation to be of a higher quality, so we can focus on 3D creation rather than modelling.
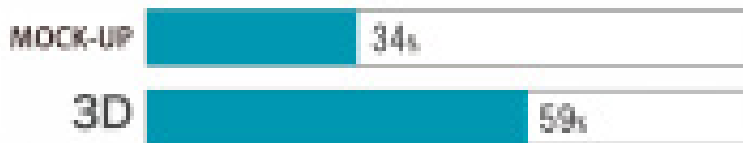

Fig.6 Consciousness survey on mock and 3D creation

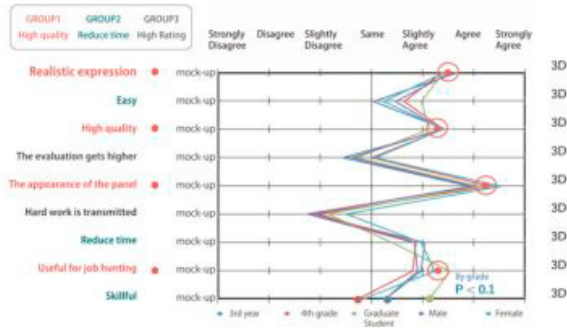Therefore, it is necessary to raise awareness about model creation.

Fig.7 Comparison of impression of 3D model and Mock-Up

4 Verification of Design Proposal

Based on the results of the above-mentioned survey, we produced prototype teaching methods carrying a series of flow and method of model creation.
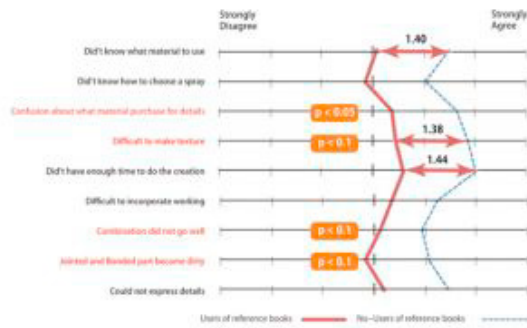

Fig.8 Comparison based on the use of reference books

These interactive methods were then distributed in exercise classes for sophomore student of the university, and we examined the differences in the production between students who used or did not use the methods. Results showed that students who utilized the booklet, as shown in the table below, were able to smoothly produce models. In addition, in a survey conducted to confirm the superiority of the booklet, the contents of the presented information proved to be effective.
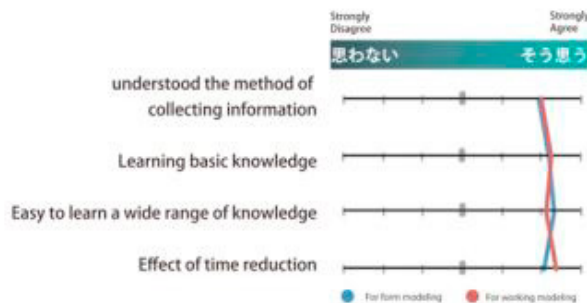

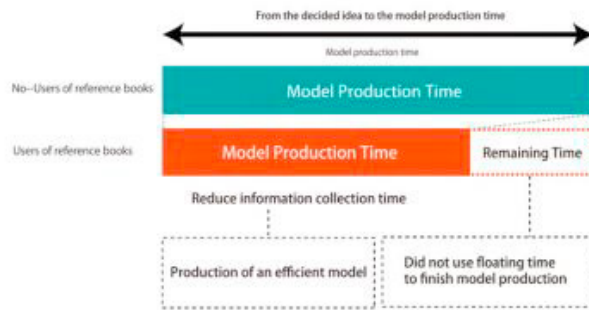Fig.9 The superiority of the Reference Book

Fig.10 Difference in time allocation depending on whether Reference Books are used or not

5   Design Proposal

We hope that students will actively carry out model creation and propose teaching methods focussing on the following three concepts of 'expansion of idea images'.
   1) Provision of compiled information
   2) Learning method through interactive behaviors
   3) Teaching materials specialised for model creation

5.1   Teaching methods for creating Forms

With the concept of 'teaching methods to be shown in 3D dimensions' and the scanning of pictures of the model table, it was possible to confirm the stereoscopic image with the Interaction(AR) technology in the application, and we aimed at expanding the model image of students' work.

Fig.11 Teaching interactive methods to show in 3D

5.2   Supporting methods for creating Working Models

We thought that it was necessary to take a chance on promoting interest in interactive work, and proposed a 'gimmick teaching methods' that can actually be used, and worked on teaching methods with interactive methods that can be easily be incorporated even by design students.

Fig.12 Reference Books

6   Conclusion

Many students have a tendency to avoid model expressions because of poor skills, even when there is a good idea in the design exercise lesson. According to our survey results about the problems that students encounter in modelling, it was confirmed that a foundation had not been established for model creation. In the design process, we had to create a task for raising the image of the idea in 3D dimension, but the problem was that there was nothing to reference. Additionally, using a survey used to better understand the current state of consciousness about model production, we understood that in the current situation, students are enthusiastic about watching model making believe that it is necessary to raise consciousness. In this research, we proposed teaching methods focused on 'gathered information gathered', 'educational methods for experiential learn through interactive behaviors', and 'teaching methods specialised for model creation' based on the concept of 'spreading idea images'. We thus thought about the proposal as divided into 'form production' and 'working model production'. First, in the case of form production, the concept of 'interactive teaching method to be shown in 3D dimension' was taken as a concept, and when a photograph of a model table was scanned, the stereoscopic image could be confirmed with interaction(AR) technology in the application, and the aim became the expansion of the image of the form of this work. In the working model production, we believe that it is necessary to give students the opportunity to be interested in electronic work and propose a work-in-progress type of material that embeds an activity that allows even design students to easily incorporate it using the concept of 'interactive demonstration of teaching methods'; we were successful in this endeavor.

7   References

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