Activity Report of Intellectual Property Student Advisory Office
at Sendai National College of Technology in 2010

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Abstract
In the execution of CO-OP or Internship, the ability that the result of the demonstrated creativity can be made as an intellectual property is requested at a worldwide level in the 21st century. Students of engineering are very capable of developing their own creativity by suitable educational contents focused on experiences, starting just after the entering the education system. Sendai National College of Technology (SNCT) has been implementing creativity education of experience-based thinking in individual grade levels from 15 to 22 years old in order to train up the students from an early stage for creative and practical engineering. This Creativity-based Intellectual Property Education Project has been adopted by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT), under its contemporary education needs supporting program in 2006. The project is to construct an educational system that has the following characteristics; 1) to collaborate and unify creative education and intellectual properties, and 2) for the students to recognize the importance of the profit that results from their activities, giving them a strong motivation to achieve property rights. We targeted training the environment of students and challenging new businesses by producing innovative products with new technologies. Intellectual Property Student Advisory Office (IPSAO) is the centre of fostering human resources specializing in creativity, organizing invention contest, lecturing on intellectual property rights and filing the students’ patents. This paper reports the framework of our project in detail and the environment of the students’ exciting participation, which are performed at SNCT in 2010.

Keywords: Creativity education, Intellectual property, Intellectual Property Student Advisory Office (IPSAO), Invention contest, Lecture on patent.

INTRODUCTION
Sendai National College of Technology (SNCT) has been implementing curriculum reform to train students as engineers, having to do with industrial bases, who are wealthy in creativity, from the early stage immediately after junior high school graduation. The 2nd year student who took “the creativity project” subject, newly created by this reform, became the 4th year student in 2006, and
reached the step of taking the “synthetic seminar” subject. Thus, the creativity upbringing education system has begun to work in real earnest. It is expanding the system which continues to be “the long-term internship as the part of the graduation research” for the 5th year student in the regular course, “the long-term internship”, “the exercise on creativity engineering” for the 1st year student and “the thesis work” for the 2nd year student in the Advanced Engineering Course.

The trial to reform a curriculum that truly fosters the creativity of the student according to their knowledge and experience levels consistently is required now at SNCT. The fruits of students’ activities are useful to society, and it is important to authorize the intellectual property as a right and its process plays an active part in the industrial fields as the technical expert.

Drafting such a viewpoint, the project of 3 annual total pictures applied to the contemporary education needs supporting program in 2006 under the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) was adopted (Itoh, et al., 2007, 2008 and 2009). The title of the project is the cooperation and the integration between early creativity education and intellectual property education - It understands the result of the early creativity practice of a 22 year old from a 15 year olds’ fresh brain; it understands the meaning from the viewpoint of intellectual property and building an experience-based education system to utilize-

In this paper, the activities of IPSAO in 2010 after finishing the supporting program (Itoh, et al., 2010) are mainly described.

THE EDUCATIONAL SYSTEM OF SENDAI NATIONAL COLLEGE OF TECHNOLOGY

The Natori Campus of Sendai National College of Technology (SNCT) has set up a regular five-year course of higher education, and also a two-year course of Advanced Engineering over it, as shown in Fig.1. The regular course consists of 5 departments; Mechanical Engineering, Electrical Engineering, Architecture, Materials Science and Engineering, and Design and Computer Applications. The Advanced Engineering Course also consists of 2 courses; “Production System Engineering” and “Architecture, Design and Computer Applications”.

The educational program of Production Systems and Design Engineering of the advanced course was authorized by the Japan Accreditation Board for Engineering Education (JABEE), in the
field of engineering science in April, 2003.

FIGURE 1
Educational System of Sendai National College of Technology (Natori Campus)

OVERVIEW OF THE PROJECT ADOPTED IN 2006

The aim of the adopted project is to provide the human resource upbringing system, in which the upbringing of knowledge-building placed a practicing technical expert training course with invention as the possible intellectual properties creation course. The students who have experienced the course will create a new technology and a new product in the scene of manufacturing and bring rich human resources with idea power which daringly challenges new business.

The overview of this project is shown in Fig.2. This project cooperates and integrates the experience thinking type creativity education to be implemented according to the grade consistency with the lower grade period. Further, it makes students recognize a profitability to the society of the activity result of the student and the importance of authorizing it as intellectual properties as a right. This project builds the education system of the creativity and intellectual property which educates the process.

Specifically, it does intellectual property education according to the development step, and establishes a system of cooperation with e-learning, leader training, and the fullness of the practicing intellectual property education by graduate research and invention contest and the
establishment of the patent application support system for the student. The evaluation and the improvement of the education system are also contents to be implemented.

FIGURE 2
Overview of the Adopted Project

![Collaboration and Unification between the Creativity Education and the Intellectual Property Education to Encourage the Students as I.P. Talents](Image)

**EFFECTIVENESS FOR THE EDUCATIONAL REFORM**

Creative activities of students are useful to society and become vital when authorized as intellectual property rights and the process plays an active part in the industrial world as the technical expert. The necessity and the establishment of such an education system are indispensable in bringing rich human resources with idea power which daringly tries to challenge the development of new technology, the new product and the new business in the industrial fields of the future.

The quality of the contents and the archives for the education of creativity and intellectual property which were based on creativity education subjects are raised every year, and the range to handle them will be spread. Then, the education assets of the education of high creativity and intellectual property are accumulated at the altitude of the main school, and the foundation of the valid utilization is built. The promotion of the industry, too, can be contributed to in addition to the possibility of the patent merit rising in the form which involved a student doing graduate research and invention contest by the cooperation with the industrial world and living intellectual property education’s being able to be realized.
EXECUTION SYSTEM OF THE PROJECT

The execution system of this project is shown in Fig. 3. The Intellectual Property Student Advisory Office (IPSAO) plays a main role in promoting this project, which is newly established at the collaborative technology center. IPSAO consists of 10 members including teachers, technical staffs and clerical staffs. IPSAO is in the center of fostering human resources specializing in creativity, organizing student invention contests, lecturing on intellectual property rights and filing students’ patents.

FIGURE 3
Execution System of the Project

PROJECT EXECUTION PLANNING IN 2010 AND EARLY 2011

The project execution plans in 2010 and early 2011 are as follows:

1. Hosting of “the Student Invention Contest” at the SNCT Festival (May-November, 2010)
2. Hosting of “the patent lecture” (October, 2010)
REPORT ON THE EXECUTION OF THE PROJECT IN 2010 AND EARLY 2011

Student Invention Contest at the SNCT Festival

Because the invention contest appeals to student's intellectual property mind immediately, the most educational effect can be expected of the activation of the aim of the project. At the first fiscal year of the project, one idea applied for the student invention contest was applied for a patent. At the second year, three ideas were applied for patents. Further, at the third year, two ideas were applied for patents. Four patents had been acquired by the end of 2009.

The Student Invention Contest was held almost similarly at the fifth fiscal year of the project. The Student Invention Contest was held at the SNCT festival on October 30th and 31st in 2010. The aim of the contest was to grasp the results of creativity education and to show that it is possible to connect improvements of the education contents with an attempt for power of planning and the plan of the student and the executive ability, and to improve the educational contents of the subject at SNCT.

Recruitment of ideas began during summer vacation for the application period. The application deadline was made after one week of the summer vacation end. In the application form, the patent specification is considered. It was assumed the form that filled in "Title of invention", "Relating technical field", "Technology or prior art that existed in the background of the invention", "Problems to be resolved by the invention", "Means of solving the problems and method", "Best form to practice the advantageous effect of the invention and the invention", and "Use possibility and effect on industry", and described "I want to appeal additionally" additionally by the free style type. The situation of the student invention contest is shown in Fig.4. We hosted an invention contest in 4 departments of the idea department (the theme is free), the problem department (the ideas about going to school or dorm life, setting a theme from the daily life convenient article), the creativity project department and the exercise on creativity engineering department.

The number of applications was three for the idea department, eight for the problem department, five for the creativity project and two for the exercise on creativity engineering. The applied ideas are evaluated through the middle examination by the member of IPSAO, based on the item shown in Table 1. It brought in the opinion of the extramural expert, too. The application was
introduced contents by the contest via the middle examination and the subscription status fixed the excellent prize and the winning a prize of each department by vote. But, the creativity project and the exercise on creativity engineering department depended on the recommendation of the guide teacher.

There were 193 pieces of participation in the vote within 2 days. Conception power with students of national college of technology and flexible creativity were evaluated in the comment from the judge. It guided in three which won a prize in the idea department and the problem department for the patent application.

FIGURE 4
Appearance of exhibition at SNCT Student Invention Contest in 2010

TABLE 1
Items at the middle examination

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>No</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Point aimed at</td>
<td>8</td>
<td>Effect</td>
</tr>
<tr>
<td>2</td>
<td>Novelty</td>
<td>9</td>
<td>It seems to be a Technical College student.</td>
</tr>
<tr>
<td>3</td>
<td>Probing into the idea</td>
<td>10</td>
<td>Educational effect</td>
</tr>
<tr>
<td>4</td>
<td>Concreteness</td>
<td>11</td>
<td>Ethics</td>
</tr>
<tr>
<td>5</td>
<td>Investigation level</td>
<td>12</td>
<td>Writing of material</td>
</tr>
<tr>
<td>6</td>
<td>Perfection</td>
<td>13</td>
<td>Autonomy</td>
</tr>
<tr>
<td>7</td>
<td>Feasibility</td>
<td>14</td>
<td>Motivation</td>
</tr>
</tbody>
</table>

The Patent Lecture

We had the support of the coordinators on intellectual property in our campus, and the 90-minute patent lecture is implemented for the 1st year students in the advanced engineering course in 2010. Situation of the Patent Lecture is shown in Fig.5. After the lecture was over, we gave a questionnaire to each student. The question was as shown below:

Question: How about the subject on Intellectual Property? (Please select from the following
alternatives. Ans.1: It should begin as the lecture and make a credit. Ans.2: I don’t attend a lecture even if it makes a credit. Ans.3: I think after seeing a syllabus. Ans.4: The others including the non-response.)

The answers are shown in Table 2. Most of the participants were interested in the patent and the invention. We think that students know the necessity of the Intellectual Property Education. An impression on the lecture is shown below:

**Impressions:** Because the student investigated needs in the class of Exercise on Creativity Engineering, and the parent seminar had been executed at the stage where each group had set the theme, they seriously audited, and the appearance that tried to be made the best use of for the future work was seen. It is thought that the establishment of the immersion program for intellectual property by cooperation with the Exercise on Creativity Engineering, and making to the credit are effective at the advanced course.

With considering the results as shown in Table 2, the subject on Intellectual Property is started for the fifth year students at the regular course in the 2011 fiscal year.

**FIGURE 5**
Situation of the Patent Lecture

1) The patent seminar for the 1st year students in the advanced engineering course

2) Patent retrieval practice by way of internet

**TABLE 2**
Answers to the Question

<table>
<thead>
<tr>
<th>Answer</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
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<tbody>
<tr>
<td>1</td>
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<td>18</td>
<td>18</td>
<td>24</td>
<td>42</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>46</td>
<td>77</td>
<td>68</td>
<td>42</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>15</td>
<td>5</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

(in percentage terms)
CONCLUSIONS

In this paper, the activities of IPSAO in 2010 were mainly described. There were a lot of subscriptions in the SNCT invention contest. In this year, the SNCT invention contest is fixing as the regular event in our college. The entire IPSAO member cannot hide pleasure and the wish of the surprise in the height of student’s interest to “the invention and the patent” and the height of the interest of the people of the protector.

Various, educational attempts concerning the intellectual property has been developed through the project. Through the process in which the student applies for the patent, the intellectual property mind has spread to the environment of the students who acquired the patent.

We feel that the intellectual property mind penetrates into the students through the implementation of the patent lecture, the invention contest and the class of the technical writing. We think that the creativity education system which was the conscious of the intellectual property including the effective use of these facilities is arranged in the future, that the students who have experienced the course will create a new technology and a new product as rich human resources with the idea power which daringly challenges new business can be brought up.

REFERENCES


