INVESTIGATING THE ADVANTAGES AND DISADVANTAGES OF TAIWAN’S INDUSTRIAL DESIGN EDUCATION FROM DEPARTMENT EVALUATION DATA

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Abstract. With Taipei being nominated for the World Design Capital 2016, an event that emphasize “design thinking,” issues such as identifying Taiwan’s design education development trends and crucial factors influencing Taiwan’s design industry development must be addressed for Taiwan’s future design education. This study conducted a pilot study to investigate design department objectives, analysed designer abilities required by businesses, and referred to the design department evaluations. The results showed that for industrial design departments, issues that required most improvements were: (a) concerning those to better implement self-improvement mechanisms so that course learning objectives are adjusted to meet business expectations; and (b) Space and equipment should be upgraded. In addition to the upgrade, the actual requirements of the enterprise should be consulted for planning. In addition to making such changes, design departments should plan design education according to the actual requirements of businesses. The results of this study may be used as reference when engaging in department planning for the development of industrial design education in Taiwan.

1. Introduction
Taiwan’s higher design education originated in 1964, the year when the Ming Chi Institute of Technology (current Ming Chi University of Technology) introduced the industrial design program. A period of five decades has passed since 1964, during which “design” has shown a clear intangible influence on Taiwan’s economic development as well as various sectors such as national competitiveness and people’s livelihood. A review of Taiwan’s design education in practice shows significant developments. In fact, Ph.D. programs in design were further added in 2000 [1].

Under this premise, this study investigated the current situation and problems concerning the development of higher design education in Taiwan by analyzing the evaluation contents produced by various schools. The development of industrial design education was further explored by examining the educational objectives of design departments, and evaluation analyses. The analysis results are shown below.
2. Target Abilities Set by Design Department and Abilities that Business Expected from Industrial Designers

According to data compiled by the Statistics Department of Taiwan’s Ministry of Education, the number of graduates from design-related departments in Taiwan amounts to more than 5,000 students per year. Similarly, students studying in undergraduate design-related courses such as visual communication design, product design, and interior design increased from over 30,000 during the 2007–2008 academic year to more than 40,000 during the 2010–2011 academic year, showing an increase of 40%. The number and quality of students graduating from such design departments have a direct effect on whether the personnel requirements of related industries can be satisfied as well as Taiwan’s overall national competitiveness.

Previous design education mainly focused on practical training. The demands of related industries for designers were also relatively simple. However, as the overall environment evolved, the requirements diversified. Norman [2] proposed different views pertaining to future design education. For designers, they must not only possess the necessary professional skills, but also deal with work-related issues such as company organizational structure, social issues, interpersonal relationships, and service and design experiences. Following the government’s policies to promote the cultural and creative industry, colleges and universities established related departments. However, whether the knowledge and skills taught in schools are able to meet current or future industry needs is an issue worthy of investigation. Therefore, we conducted a pilot study to investigate schools’ objectives for founding cultural and creative design-related departments to assess students’ acquisition of skills from higher education. The analysis results are shown below.

2.1. Analysis of the Objectives for Founding Design-Related Departments

Currently, design-related departments in Taiwan total more than 200. Competition between design schools remains fierce and schools are engaging in specialization and differentiation-related efforts to distinguish themselves from competition. Thus, an analysis of the objectives set by the departments as well as their unique characteristics will provide insight into the current trends in the abilities of designers under the new cultural and creative environment. For the first stage of the analysis, this study used a sample of 28 creative design-related departments. Such departments’ name were divided into seven orientations or types: cultural vocation development, cultural and creative industry, cultural and creative industry management, cultural creativity and design, creative and digital media design, creative design, and others.

By combining the educational objectives of the 28 departments, we obtained a total of 49 ability items. Next, we separated these ability items into different groups and found that the abilities could be roughly divided into seven categories, which were “comprehensive abilities,” “theory-based abilities,” “digital technology-related abilities,” “practical abilities,” “property rights knowledge,” “interior design abilities,” and “marketing and management abilities.” The top three most frequently mentioned abilities were “practical abilities,” “marketing-based planning and management abilities,” and “creative thinking abilities and cultural literacy.” The analysis also showed that the focus of education differed between the seven department types, which are listed as follows: cultural vocation development departments focused on cultural literacy; cultural and creative industry departments emphasized on operational management; cultural and creative industry management departments paid attention to marketing-based planning and operational management; cultural creativity and design departments stressed the importance of theories, cultural literacy, and art literacy; digital media design departments focused on interdisciplinary integration abilities, digital technology-related abilities, and marketing-based planning; and creative design and lifestyle departments emphasized “creative thinking abilities,” “product development,” and “exhibition activity-based designs” (Table 1).

The 49 abilities were also divided into seven categories, of which comprehensive ability-related learning accounted for the highest percentage (i.e., 24.24%), followed by theoretical foundation ability-related learning (i.e., 22.44%) and digital technology ability-related learning (i.e., 16.32%). The results showed that these three abilities were the key abilities to be developed (Figure 1) [3].
An analysis of the educational objectives shows that cultural and creative design-related departments focused on practical abilities, marketing-based planning abilities, management abilities, creative thinking abilities, and cultural literacy as the key abilities to be developed. Concerning other departments, indicators for abilities to be developed also differed. Such ability indicators signified future abilities of the students. Therefore, whether these abilities meet the needs of employers is a topic worthy of further investigation.

Table 1. Key Abilities to be Learned According to Each Respective Department

| Department types         | Focus of education                        |
|--------------------------|-------------------------------------------|
| cultural vocation design | cultural literacy                         |
| cultural and creative industry | operational management                  |
| cultural and creative industry | marketing-based planning and operational management |
| cultural creativity and design | theories, cultural literacy, and art literacy |
| creative and digital media design | insufficient for analysis due to low number of departments |
| creative design          |                                           |
| others                   |                                           |

2.2. Examining the Problems of the Current Era via Higher Education Evaluation

Taiwan’s higher education evaluation has changed over time. Related evaluation systems have evolved from general school evaluation to professional education evaluation [4]. Most department evaluations in the second-stage further emphasized assessing students’ learning results [5].

The Taiwan Ministry of Education has set clear targets for the two stages of higher education evaluation, in which the goals for the first-stage and second-stage department evaluations were to “ensure that students are provided a high-quality learning environment” and “promote and implement mechanisms ensuring favorable student learning results,” respectively. The two-stage evaluation targets show how expectations and values of education have changed over time. In addition to the problem of sub-replacement fertility, imbalanced education quality, poor resource allocation, and globalization of education markets, challenges related to talent issues in the market has resulted in higher education resources becoming overly dispersed, defeating the intentions of the government when it rapidly increased the number of universities. The oversupply of education has led to incessant higher education crises and related problems such as low college and university competitiveness, low student enrollment rates, and poor student qualities [5].

Mechanisms to ensure the learning results of students were introduced to guide the abilities of students, emphasizing what they had learned and were capable of doing. The rapid increase in the number of universities resulted in poor student quality and the gap between students trained by schools and professional personnel required by businesses. Such an issue is a clear social problem and one that potentially jeopardizes national competitiveness.

3. Current Situation of Design Education Following Department Evaluations

This study first explored current situations and problems of higher industrial design education. Next, the advantages and disadvantages of Taiwan’s current industrial design education were analyzed using evaluation content obtained by the Higher Education Evaluation & Accreditation Council of Taiwan and the Taiwan Assessment and Evaluation Association.
3.1. Sample Used for Industrial Design Evaluation and Analyses

This study selected only industrial design departments as the study sample and used department evaluation reports issued by evaluation centers on their websites as the basis of analyses. By searching through the online database of the evaluation centers, we obtained the evaluation data of six general university industrial design departments and four technical and vocational university industrial design departments. The evaluation and analysis sample thus comprised 10 university industrial design departments (Table 2).

Table 2. Sample of industrial design departments selected for evaluation and analysis

| General Universities | Technical and Vocational Universities |
|----------------------|---------------------------------------|
| Tatung University    | Ming Chi University of Technology     |
| Dayeh University     | Yunlin University of Technology       |
| Tunghai University   | Taipei University of Technology       |
| Cheng Kung University| Chaoyah University of Technology       |
| Hualien University   | Department of Industrial Design        |

3.2. Evaluation of the Advantages and Disadvantages of General University Industrial Design Departments

Analysis showed that the primary advantages of general universities are as follows: characteristics developed by departments matched the education philosophies of the school. The long-term class teacher or mentor systems enabled teachers to fully understand students’ personal characteristics. In addition, interdisciplinary development strategies could be adopted for resource integration, and joint work with the professional industry facilitated finding cooperative education opportunities. Conversely, the disadvantages of general universities are listed below: curriculum planning and teacher expertise were unable to meet school’s educational objectives; and lack of a systematic course plan, in which courses to be studied for each respective industry remained unclear. The advantages and disadvantages were compared and compiled into Table 3. Four items (emboldened in the table) featuring both advantages and disadvantages were: (1) the teacher and senior student guidance system helped guide junior students in making course selections. However, systematic course plans indicating courses to be studied for each respective industry were not available, indicating a need for improvement; (2) although the educational space and facilities were sufficient for learning, they were insufficient for meeting the departments’ needs and educational objectives. To identify the reasons contributing to such problems, the departments’ educational objectives and course directions must first be examined; (3) most departments were able to continue offering self-improvement courses. However, various self-evaluation mechanisms were ineffective; and (4) although alumni clubs were founded, they operated poorly and were thus unable to provide recommendations to departments for students’ future developments.

3.3. Evaluation of the Advantages and Disadvantages of Technical and Vocational University Industrial Design Departments

The advantages of technical and vocational universities are as follows: teachers possessed practical and research experiences; teachers from the professional industry were employed, elevating academia–industrial connections; teachers possessed practical experiences that helped students connect with the professional industry; course syllabi were promptly uploaded online; multipurpose studios were established; and interdisciplinary counseling mechanisms and dual-class teacher/mentor systems were in place. Conversely, the disadvantages of technical and vocational universities are listed below: some classrooms failed to meet educational objectives and classroom F had to be done; inadequate employment of equipment maintenance personnel was observed; facilities were supervised by the school-level management, making usage inconvenient for departments; and computer and other equipment were insufficient in design workshops.

The advantages and disadvantages were compared and compiled into Table 4. Three items (emboldened in the table) featuring both advantages and disadvantages were: (1) complete
management guidelines and systems for specialized classrooms were enforced. However, some classrooms failed to meet educational objectives and classroom replanning had to be done; (2) the schools supplied departments with sufficient funding and equipment. However, computer and other equipment were insufficient in design workshops, indicating the need for improved funding allocation; and (3) departments possessed interdisciplinary counseling mechanisms. However, no interdisciplinary learning mechanisms were in place to meet students’ diverse learning demands.

3.4. Cross Analysis of the Advantages and Disadvantages Listed in the Industrial Design Department Evaluation Results of Both General Universities and Technical and Vocational Universities

By performing a cross analysis on the industrial design department evaluation results of both general universities and technical and vocational universities, this study identified the advantages of industrial design education in Taiwan, which are listed as follows: (1) students are successfully motivated to participate in design-related competitions; and (2) high ratio of graduates being employed. Conversely, the disadvantages of industrial design education in Taiwan are as follows: (1) improvements remain to be made in educational space and facilities; and (2) alumni club operation is inadequate and unable to facilitate department development.

Table 3. Evaluation of the advantages and disadvantages of general university industrial design departments

| Item | General University | Technical and Vocational University |
|------|-------------------|-------------------------------------|
| **Objectives** | Clearly matched departments’ educational objectives | Clearly matched departments’ educational objectives |
| **Characteristics** | Characteristics developed by departments matched the education philosophies of the school | Characteristics developed by departments matched the education philosophies of the school |
| **Research** | Research projects that received funding from the Ministry of Science and Technology were prioritized | Research projects and essays were completed by the same small group of teachers |
| **Activities** | Student design competitions were held | Industry-related design competitions were held |
| **Courses** | Teacher and student guidance system helped to meet educational objectives | Course curriculum failed to meet educational objectives |
| **Student development** | Self-evaluation mechanisms were effective | Self-evaluation mechanisms were ineffective |
| **Students** | Most graduates worked in design-related jobs | Surveys on the employment status of school graduates were missing |

Alumni clubs were established to provide recommendations to departments concerning students’ future development.
### Table 4. Evaluation of the advantages and disadvantages of technical and vocational university industrial design departments

| Item                  | Evaluation of technical and vocational university industrial design departments (advantages) | Evaluation of technical and vocational university industrial design departments (disadvantages) |
|-----------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| **Objectives**        | Educational objectives were unclear and students were trained only for limited fields.         |                                                                                               |
| **Characteristics**   | Showed that compared with the industrial design departments of technical and vocational universities, those of general universities featured superior research potential and evaluation mechanisms. Conversely, industrial design departments of technical and vocational universities displayed more favorable education. In other words, the former better met the department evaluation expectations in research potential and evaluation mechanisms, whereas the latter better met business expectations in education. The analysis also proposed more suggestions in the area of education for general universities, showing that general universities required more improvements in such area. General universities placed their focus on using ability indicators and considering abilities needed by industries in making course planning-related adjustments. Conversely, technical and vocational universities emphasized that teachers possess practical experiences and provide comprehensive learning portfolios to guide students’ learning; most of the departments provided students with learning portfolios to help them select courses and attached great importance to related performance and competitions. However, alumni clubs operated poorly and were unable to provide department with resources effectively. In addition, education space and facilities were inadequate, preventing the departments from enhancing their education-related special features to improve their competitiveness. The analysis results are cross-analyzed with the goals of the Design Department, business surveys, and evaluation results, in which the results showed that for industrial design departments, the areas requiring most improvements were: (a) to better implement self-improvement mechanisms so that course learning objectives are better adjusted to meet business expectations; and (b) to upgrade design education space and facilities. In addition to making such changes, design departments should plan design education according to the actual needs of businesses. The results of this study may be used as a reference when engaging in department planning for the development of industrial design education in Taiwan. Taipei is successful bid to host the 2016 World Design Capital, the spirit of main "Adaptive City- Design in Motion," that emphasized Taipei is a continuous improvement city, that related studies on design education and promotion are indispensable. This study should have an era representative and looking forward to providing the planning and development of recommendations for education of industrial design department in Taiwan. |
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