

# Fostering Innovative Teaching Competencies in Industrial Design: A Malaysian Higher Education Perspective

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## Abstract

This study explores the development of innovative teaching competencies among lecturers in Industrial Design within the context of Malaysia higher education. As the design education continually evolves with the technological advancement, it is essential for educators to adopt innovative and adaptable teaching strategies. The research focuses on identifying the key competencies of lecturers in industrial design education to effectively fostering creativity, critical thinking and innovation in their students. This study adopted qualitative approaches by employing the Behavioral Event Interview (BEI) method to gather in-depth insights from ten experienced design experts in Malaysia. The BEI techniques were used to explore the attitudes, behaviors, and experiences of these experts in relation to teaching practices and competency development. The findings highlighted a range of competencies required by the lectures in industrial design education, including dynamic knowledge of design technologies, ability to nurture transferable skills, and proficiency in using educational technologies. Based on the findings, a competency framework tailored for Industrial Design educators in Malaysia is developed to guide the professional development of lecturers, enhance teaching effectiveness and improve the quality of design education in Malaysia higher education.

**Keywords:** Industrial Design, Design Education, Design Competency, Higher Education, and Teaching Method

## Introduction

Industrial Design (ID) education emphasizes in producing talents with high creativity and capable in harnessing original idea to drive innovation (OED, 2022). Instead of just focusing on the outcome, the learning process is also prominent in ID education. To cultivate creativity, students are encouraged to think beyond conventional boundaries. Differ from conventional ID education which highlighted on physical products (Norman, 2010), the current modern design landscape stressing more on human interaction, service design and experiential

design. The setbacks of contemporary design always involve social, economic, and political issues, positioning designers as applied behavioral scientist. Many of the educators are struggling to fully grasp these complexities even though different training has been introduced.

To address this, a competency model for Industrial Design lecturers is essential to enhance their ability to deliver creative and impactful learning experiences, refining instructional strategies, particularly in fostering creativity. As creativity becomes increasingly vital in 21st-century education, it is crucial for the educators to adapt their method to aid students in solving complex, real-world design problems with innovative approaches.

### **Research Background**

This research examined the lecturers' competency standards in Industrial Design (ID) education. Effective teaching with the competencies defined as the ability to apply knowledge, skills, attitude, and personal traits in professional setting, are crucial in today's competitive landscape. A lecturers' key role is to provide a conducive learning environment, translating subject content into engaging and attracting as well as meaningful activities through different teaching approaches to enhance students' learning outcomes.

Historically, the Bauhaus School in Germany had a major influence in forming of modern Industrial Design education. Over time, the growth of design education is witnessed by the significant increase in student number, especially in private institutions (Ilhan, 2017). Emerging economies such as BRICS nations has raised awareness in global recognition for original design work, due to greatly influenced by Western education system and industrialization.

While shifting from production-based to a knowledge-driven economy, Malaysia strives to compete in global setting (Selvaraj et al., 2014). In this context, creativity is playing an important role in both teaching and learning, solving unstructured tasks by applying existing knowledge innovatively. This approach encourages lifelong learning, cultivate students to transform knowledge into new ideas and solutions to enhance quality of life. In Industrial Design (ID) education context, from modern-era Germany and the USA serves as the historical examples which shows the significant impact of curriculum visualization in communicating the goals and content of design education.

### **Research Objective**

To better adapt the Industrial Design (ID) lecturers with the changing environment and industry demand, a guideline or framework should be provided to the lecturers to make sure they can improve their teaching competencies to produce high quality of Industrial Design graduates which fulfilling the needs of industry. Therefore, this research is aimed to:

- Examine the competencies needed to be equipped by Industrial Design (ID) lecturers among Malaysia Higher Education.
- Develop a Competency List and Framework for Industrial Design (ID) lecturers in Malaysia Higher Education.

## Methodology

This research adopted qualitative method to explore the attitudes, behaviors, and experiences of ten design expert through interviews. Behavioral Event Interview (BEI) which illustrate the event occurring within the research context while providing a detailed understanding of individuals' perspectives and behaviors, is being used in this research. The interview sessions were guided with protocol, enabling a thorough examination of experts' perspectives on design competencies. The participants in this research comprised of experts in industrial design, who provided consent for their involvement. The sample with experts from both design education and design industry allowed this study to gain deeper insight into the experiences of professionals in the field of industrial design.

## Data Analysis and Findings

The qualitative analysis shows that there are nine items (Figure 4.1) being categorized under skills and knowledge. Under skills category, there are four items which are the skills of creative platforms, the skills of learning techniques, the skills of IR 4.0, and the skills of creative teaching methods. On the other hand, knowledge category comprised of the knowledge Industrial Design, knowledge of creative platforms, knowledge of learning theories, knowledge of IR 4.0 and knowledge of creative teaching method.

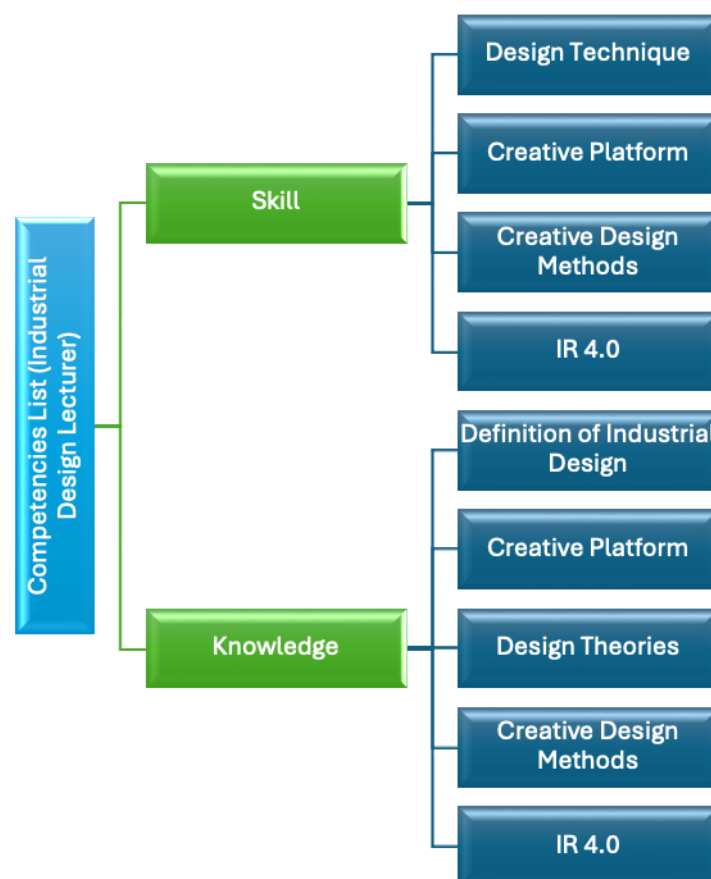


Figure 4.1: Overview of Competency List

### *Interview Findings Regarding Definition of Industrial Design*

In this study, the term “definition of industrial design” refers to the education and design processes associated with industrial design. Based on the interview, most of the interviewees agreed that an industrial design lecturer should possess the ability to effectively communicate

and demonstrate a deep understanding of product design and design process. This also covers the ability to teach and foster critical thinking skills, and the ability to deliver the concept of practical application among students.

#### *Interview Findings Regarding Design Theories*

Most of the interviewees claimed that understanding on the various design theories are essential in raising the quality of teaching and learning process in the design education context due to the theories serves as a framework of understanding in the way of students' learning and provides strategies in explaining, defining, evaluating and predicting of the industrial design learning process. For example, design theories such as social and constructivism theories illustrate the cognitive processes of knowledge transfer from lecturer to students through different methods including understanding, creating and modelling.

#### *Interview Findings Regarding Design Technique*

Based on the findings, all the interviewees agreed that the industrial design graduates' ability to be self-directed and ability to conduct lifelong learning are vital. A range of strategies is adopted to build transferable skills and discipline-specific knowledge. The research found that problem-based learning which cultivating the practical application and critical thinking skills, is an effective approach which align with the product design process with real-world demands.

#### *Interview Findings Regarding Creative Platform*

The research findings shows that all interviewees agreed that creative platforms are important for industrial design lecturers, considering them essential across all design disciplines. To optimize the creative workflow, ease the decision-making process as well as fostering innovation in design, advanced technologies and techniques are being incorporated into various platform. The utilization of social media in design education learning process was one of the prominent way to foster diverse social connection, aiding and channel the exchange of information and knowledge creation, as well as enriching design exploration among students.

Another point being highlighted from the result was regarding to the integration of digital platforms, such as 2D and 3D software into curriculum. Technologies, for example, virtual reality (VR) and augmented reality (AR) were being suggested as the effective tools in creating immersive environment that allows the product quality to align with digital models. This is especially crucial in product design which involve the transformation of design concepts into full-scaled products. On the other hand, the findings also revealed that learning platforms can enhance students' skills through the assessment and experimental framework provided by the lecturers which guide students' progress in these areas.

#### *Interview Findings Regarding Creative Design Method*

In conventional teaching, a variety of instructional techniques are being used by lecturers by utilizing different teaching technologies. For example, lecturers may employ animation software to present the subject content in a more dynamic and engaging ways, or foster creativity through activities such as brainstorming, mind-mapping and role-playing approaches. Some of the interviewees mentioned that lecturers should improve their teaching method to promote greater creativity and innovation. Majority of the interviewees

emphasized on the importance of integrating creative design method into teaching as it will make the course more engaging stimulating, making the students more attentive and improve their involvement in class.

#### *Interview Findings Regarding Industrial Revolution 4.0*

Majority of the industry interviewees claimed that the current design education is not sufficiently adapted to the changing demands of the 21<sup>st</sup> century, especially with the introduction of IR 4.0. The interviewees suggested that these technological advancement will bring great change to the lecturers' roles and teaching competencies. In industrial design context, lecturers are the key person to cultivate the future workforce with capability to cater with the change of demand by ensuring the learning objectives are aligned with the emerging needs. Hence, the integration of IR4.0 into design education is another critical factor that need to be considered by the educators.

#### **Conclusion**

Industrial design education is generally aimed to produce graduates with relevant capabilities for industrial design career. However, many of the recent studies raised the concerns on whether the modern industrial design education is fulfilling the goal of producing these talents to fulfil the industry demands (Norman, 2011; Benny, 2015; Mourtzis et al., 2018; Yu & Silva, 2021). These findings suggested that formal design education methods may not sufficiently meet the goals. Therefore, educators and institutions need to explore and develop better educational approaches to demonstrate the value of formal education for professional practice, starting from improving lecturers' competencies.

Overall, this study concluded the diverse skills set needed by the industrial design lecturers, as stated by the respondents. The analysis provides deep insights from education and industrial perspectives which turns into a comprehensive competency list and framework. The result revealed that industrial design lecturers need to possess broad range of competencies, especially those related to advanced technology so that they can deliver high-quality teaching and produce graduates with high capabilities in design field. In line with the findings, modern design education requires lecturers with not only traditional teaching competencies, but they also need to proficient in digital technology. To fulfil the market demands, lecturers must align their teaching with IR 4.0 and integrate innovative educational approaches.

#### **Significance of Study**

Theoretically, the findings of this study provide an in-depth insight and literature for the competencies list needed for industrial design lecturers in Malaysia higher education setting. The list of competencies provides a fundamental for future researchers to further the study on broader aspect such as to expand the study to Asia or Global nature. Besides, the future research may make this study as a guideline to conduct research in other field, apart from design education.

Practically, the stakeholder of industrial design field can be benefited from findings of this study, by which it serves as a framework for lecturers to improve their competencies and understand the area they should emphasis on when they are preparing their teaching material and adjusting the way of delivery of the curriculum. Investors or management of the

education institutions can make use of the results to tackle current issues on lecturers' competencies and provide appropriate training to the lecturers by referring to the competencies list.

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