Abstract: When the development of design research is examined, the disciplines interact with each other. These interactions lead to concepts such as crossdiscipline, multidiscipline, interdiscipline and transdiscipline. Industrial design education has also been rapidly affected by these interdisciplinary working methods in recent years. While developing creative problem solving techniques in this study process, aim to increase the usability of future technologies in products and services. Design Labs, which is the development area of developing new technologies, is carrying out many innovations in design researches and practices. This research project has been investigated by examining the current state of affairs on design laboratories in international academic settings and the effects on design education. The main goal of the project is to identify the importance and priority of interdisciplinary studies through the design discipline, and to specify data on design education and design research of innovative and future technologies.

Keywords: Design Labs, Interdisciplinary, Design Research, Industrial Design

1. Industrial Design and Interdisciplinarity

Before describing the interdisciplinary approach to industrial design, it is necessary to explain the interdisciplinary study. The interdisciplinary concept can be described as the simplest definition and the relationship between two or more disciplines (Apostel, 1970). Jacobs (1989) describes an approach that uses knowledge and methods of more than one discipline to examine a topic or concept. Another definition of a interdisciplinary approach is the ability to integrate two or more disciplinary knowledge and modes of thinking, such as cognitive productions, problem solving, and explaining an event that a single discipline can not (Repko, 2008).

The nature of industrial design is intertwined with many disciplines. It is a fact that both design research and industrial design education are related to and linked to other branches of industrial design in the course of their development, especially the ergonomics, materials science, production methods, anthropometry, art, marketing. It is a necessity for industrial designers to cooperate with other professional groups in their education and professional life within the context of this relationship and connection. It is inevitable that these studies should be done in design education in terms of the interaction of designers with other disciplines, developing their skills in relation to the people they work with, and learning the terminology of other disciplines. Guy Julier emphasizes the
interdisciplinary nature of industrial design as "the design profession is no longer defined as multidisciplinary, but as an interdisciplinary activity" (Julier, 2000).

In addition to these explanations, the World Design Organization (WDO-ICSID) made the definition of industrial design in 2016: "Industrial Design is a strategic problem-solving process that drives innovation, builds business success, and leads to a better quality of life through innovative products, systems, services, and experiences. Industrial Design bridges the gap between what is and what’s possible. It is a trans-disciplinary profession that harnesses creativity to resolve problems and co-create solutions with the intent of making a product, system, service, experience or a business, better. At its heart, Industrial Design provides a more optimistic way of looking at the future by reframing problems as opportunities. It links innovation, technology, research, business, and customers to provide new value and competitive advantage across economic, social, and environmental sphere."

As a result of these definitions, the interdisciplinary nature of industrial design requires intensive work in theory and practice with other disciplines.

2. Design Labs

Design laboratories can be defined as specially equipped spaces where research and experiments are carried out using various tools in design field. Binder and Brandt (2008, pp. 115-129), who are studying how the design can be done in the laboratory environment, define characteristic of design research as studios, atelier and design workshops, but the concept of design lab is superior than these components in terms of transparency, experimentation and documentation. The laboratory environment also provides opportunities and benefits for researchers; (Koskinen et al., 2011). It can be used to make alternative explanations, to test hypotheses, to elicit alternative explanations after research, to make more detailed and accurate measurements and observations with the equipment in the laboratory, to make detailed documentation and to repeat the work in other laboratories. These design laboratories are structured on different subjects in industrial design schools in many countries around the world. It shows a lot of examples of our study; design laboratories, interdisciplinary research centers of 21st century (2015).

3. Conclusion

Design laboratories are defined as research centers that make advanced technology, smart materials and futuristic studies, as well as aiming to design product, system, service, experience, interaction etc., meanwhile conducting research, developing projects and make theoretical, philosophical or practical applications within today's technology and facilities. Conducting researches in Design Laboratories that address the issues of social life within a framework that relates the basics of problems to different disciplines, will be effective in the production of sustainable solutions. The human-centered approach of design research will be instrumental in bringing together the various disciplines in the solution of social problems to bring forth the feasible outcomes.

As a result, we can say that these constructions provide important contributions to the scientification of industrial design and are important for practice led research and interdisciplinary studies. It is anticipated that these design lab structures and interdisciplinary organizations will grow and expand in the future as well.
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Design Lab: For Future Research

When the development of design research is examined, it is clear that the disciplines interact with each other. These interactions lead to concepts such as innovation, multidisciplinary, and interdisciplinary. By bringing these methods together, it is possible to create a more holistic approach to design research.

While developing research questions, it is important to consider the social and environmental impacts of design. Design research can be used to improve the quality of life for individuals and communities. Design research is an interdisciplinary field that involves collaboration between different disciplines, such as engineering, materials science, production methods, anthropomorphology, art, marketing, and more. The goal of design research is to create innovative solutions that address social and environmental challenges.

This text will focus on various aspects of design research, including design methods, design tools, and design processes. It will also cover the history and evolution of design research, as well as current trends and challenges in the field.

Design Lab: For Future Research

In addition to these explanations, the World Design Organization (WDO) made the definition of design research in 2010:

"Design research is a strategic problem-solving process that involves innovation, builds business success, and leads to a better quality of life through innovative products, systems, services, and experiences. Design research bridges the gap between what is and what’s possible if it is well done. This means that designers must create solutions that are innovative, creative, and sustainable, and that they must work with a wide range of stakeholders to develop new and innovative solutions that address real-world problems."