

Effects of Integrating Digital Presentation Tools in Industrial Design Program for Higher Education

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ABSTRACT

This paper will discuss the effects of three types of digital presentation tools: Prezi, PowerPoint, and PowToon. The discussion will be focusing on student engagement in Industrial Design (ID) education. Digital presentation tools provide a new and powerful way in education refers to learning from the use of different media: pictures, video, animation, text, and sound. In the previous research and study, using presentation tools in the lecture has increased students' engagement. Recently, the rapid development of digital products has changed the way of teaching and learning. Therefore, this paper aims to identify an idea of digital presentation tools for ID programmes as lecturing tools; and to explore how processes of digital presentation tools on student engagement in the learning of the ID process. This paper compiles secondary data on a topic by accredited scholars and researchers; reviews existing research on the subject; and theoretical approaches. This paper uses literature analysis to indicate the strength of variable relationships for digital presentation tools for an ID process in teaching and learning. This paper consolidates the concept of digital presentation tools for ID education and the importance of each digital presentation tool's elements in a higher education setting.

Keywords

Industrial Design Education, Digital Presentation Tools, Higher Education

Introduction

Industrial Design (ID) is part of innovation, builds business success, and leads to a better quality of life by modifying products to make them more functional or appealing or using technology to enhance product development (IDSA, 2021). During the teaching and learning process, lecturers and students are expected to be the complexities of professional practice, yet, learning the industrial design process in design education is relatively tricky and complex, especially for the first-year industrial design students. The students do not have any prior information about the industrial design process and begin to learn after entering the institute.

As mentioned in the study of Dumas (2000), learning the industrial design process is a challenge for students to understand. However, the design process is always considered one of the essential teaching materials and presented through the traditional presentation tools that lack interaction result in lower student engagement. In the study of (Bartsch & Cobern, 2003; Chou et al., 2015), using digital presentation tools in the lecture has increased students' engagement. Digital presentation tools provide a new and powerful way in education refers to learning from the use of different media: pictures, video, animation, text, and sound. Developers of presentation tools like Microsoft PowerPoint also gradually improve the software to make their products more interactive and user-friendly. It challenges design educators to adapt to the changes in the education of designers. There are three types of digital presentation tools have used for this study: Prezi, PowerPoint, and PowToon. According to previous researchers and platforms, these three digital presentation tools have been pointed as three of the best presentation tools to create, manage, and share presentation slide show (Elizabeth, 2019; Bahadur, 2013; Nora, 2014; Sutisna et al., 2019).

Therefore, this paper aims to identify an idea of digital presentation tools (Prezi, PowerPoint, and PowToon) for the ID programme as lecturing tools; and to explore how digital presentation tools' processes affect student engagement in student engagement in the learning of the ID process. This paper compiles secondary data on a topic by accredited scholars and researchers; reviews existing research on the subject; and theoretical approaches. This paper uses literature analysis to indicate the strength of variable relationships for digital presentation tools for an ID process in teaching and learning.

Methodology

This paper uses literature analysis to indicate the strength of variable relationships for digital presentation tools for ID programs in higher education, including the ID process, digital presentation tools: Prezi, PowerPoint, PowToon, and student engagement in higher education. Literature analysis integrates the results of many studies from different journals, papers, and articles into one report (Normand, 1999). All these journals and articles are searched from the database of Google Scholar, Scopus, ERA, and Science Direct. In this paper, literature analysis combines information from multiple educators, scholars, and researchers to increase the chances of a systematic review of the effectiveness and valuable finding of the idea. At the same time, an accredited association statement has been included in the literature analysis as it is international level and recognized by all design experts in the world. In Table 1, identifying studies and abstracting data are defined, and results are discussed.

The scope of analysis constitutes the study of digital presentation tools in the ID programme. This study acquired data from three topics directly related to the ID programme. These three topics are 1) Industrial Design Process, 2) Digital Presentation Tools, and 3) Student Engagement in Higher Education. These three topics play essential roles for educators in integrating effective presentation tools to teach the ID process.

Table 1: Important Issues of Digital Presentation Tools in Industrial Design Programme

Accredited association, educator, scholars or researchers	Industrial design process	Digital presentation tools	Student engagement in higher education
Design council UK (2019)	There are four distinct phases of the design process: discover, define, develop, and deliver. these phases show the divergent and convergent stages of design, showing the different modes of thinking that designers use.	-	-
Elizabeth. t. (2019)	-	Using digital presentation tools to help students organize their thought and learn best practices.	Interesting slideshows and engaging materials will help students get their point across.
G. k. bahadur. (2013)	-	to create a user-friendly learning environment, powerpoint was integrated with texts and interactive activities.	-
Hashemi, m., azizinezhad, m., & farokhi, m. (2012)	-	powerpoint can enhance the teaching sessions by allowing lecturers to use graphics and other multimedia way.	-
Nora, s. (2014)	-	prezi attaches great importance of visual effect and presents information in a less linear structure.	-
Perron, b. e., & steaens, a.	-	prezi lets users collaborate online with peers to edit	-

(2010)		presentations.	
Chou, p.n., chang, c.c., & Lu, p.-f. (2015)	-	the preceding studies confirmed that prezi became a extra powerful academic medium for information acquisition if comparable with conventional instruction.	-
Buchori, a., & cobern, k. m. (2003)	-	PowToon displays videos equipped with animations that assist students in understanding the content delivery process, so they can express their creative imagination to capture the learning process.	-
Sutisna, e., Vonti, l. h., & tresnady, s. a. (2019)	-		
Barak, m. (2018)	-	-	along with improving attention to student engagement, digital technology has emerged as a valuable element of better education, affecting all aspects of student experience inherently.
Henderson, m., selwyn, n., & aston, r. (2017)	-	-	
Trowler, v. (2010)	-	-	to optimize student learning outcomes and development, student engagement is the interaction among time, energy, and other relevant resources invested by students and institutions.

Results and Discussion

This section is discussed on issues related to this research on the effects of integrating digital presentation tools and focuses on students' engagement in the ID process for higher education. All the information is focused on digital presentation tools in ID education and divided into three subtopics. It will explain the ID process, three types of digital presentation tools and student engagement in higher education (Figure 1). The contents of these subtopics are from compiles significant research published on a theme by authorizing researchers and analysts; review existing research on a theme critically; analyze differentiating viewpoints; hypothetical approaches, strategies, discoveries, results, and conclusions.

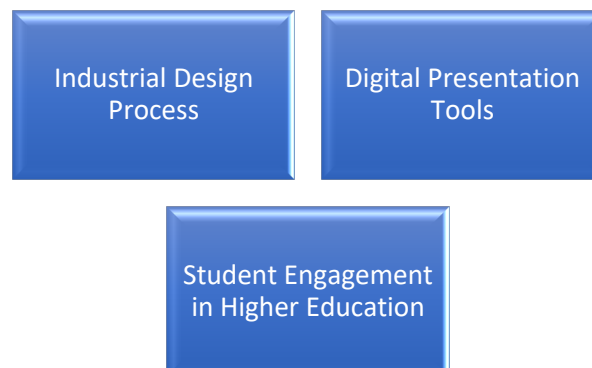


Figure 1: Overview of Literature Review

Industrial Design Process

According to the double diamond diagram developed by the Design Council UK (2019), the design process can be divided into four distinct phases: Discover, Define, Develop, and Deliver.

Discover – In the beginning, it is important to understand the challenge and then to conduct research to understand user needs. It is possible to develop new products and services based on market and research data. The outputs of marketing, consumer insights, and research teams within companies, who collect and manage information and data from key target customers. User's research plays a prominent role in the design process in the companies that visited, which emphasize user needs and experiences.

Define – Phase two involves understanding how the user needs and the problem align. Based on these insights, a design brief is created that defines the challenge clearly. In the define stage of a project, the designer is responsible for developing the initial project ideas and components necessary to address the problem at hand. The designer must engage with and understand the wider context in which the problem or opportunity sits, both within and beyond the project.

Develop – The third stage of the process involves developing, testing, and refining multiple potential solutions. Visual management techniques allow us to keep track of progress during the development stage. Iterating the concept and prototyping it until it is as close as possible to a finished product or service is the principle of the development phase.

Deliver – Finally, a single, successful solution is selected and prepared for launch as part of the final stage, it will identify any final constraints or problems before manufacturing the product, and it will check it against standards and regulations. As the product or service is developed and launched, the process now involved working with marketing, communications, packaging, and branding departments.

Digital Presentation Tools

The rapid technological change has influenced the ways of lecturer teaching presentation and students are more familiar with the use of digital tools in their classrooms (Henderson et al., 2017). Creating interesting slideshows and engaging materials will help students get their point across and give them a chance to learn best practices for using software to help them organize their thought (Elizabeth, 2019). This paper will focus on three types of digital presentation tools: Prezi, PowerPoint, and PowToon.

Microsoft PowerPoint

It is developed by Microsoft, is a computer application used for displaying specific digital content to target audiences. The use of PowerPoint for teaching displays has the enormous ability for encouraging more expert shows [1]. It can enhance the teaching sessions by allowing lecturers to use graphics and other multimedia to clarify understanding and to support different learning styles (Hashemi et al., 2012). Besides that, it was supported with texts and interactive activities which were integrated to create a dynamic and user-friendly learning environment (Bahadur, 2013). In this way, PowerPoint can be used by ID lecturers to transfer ID process knowledge to ID students using graphics with text.

Prezi

In addition to being a presentation tool like Microsoft PowerPoint, Prezi is a web-based tool that allows users to create presentations. The most unique feature is its graphic interface with zoom, which allows users to have a more near or far vision from the presentation area, in a 2.5D space (Prezi, 2019). It also allows users to move the information in a free or structured way, creating a mental map and define the relative size of the objects. As a web-based application, Prezi gives users a learning opportunity to collaboratively edit slides online with their peers (Nora, 2014). In addition, Prezi attaches great importance to visual effects, tends to attract the audience's interest, and presents information in a less linear structure (Nanni, 2015). The preceding studies confirmed that Prezi became an extra powerful academic medium for information acquisition if compared with conventional instruction (Chou et al., 2015). Therefore, Prezi is useful for ID lecturer to present information about design process in an interactive way, as the information is presented in a flexible structure, it will engage students' interest.

PowToon

PowToon is a web-based software that offers a big selection of media alternatives, graphics, and lively snapshots to create animated presentations that flow easily and logically. It integrates different types of formats and media, increasing the integration capabilities of the visual, auditory, and motion resources. Video equipped with animations can be displayed for students to comprehend the content delivery process, so their imaginations can be stimulated to capture the lessons (Buchori & Cintang 2018; Sutisna et al., 2019). Additionally, educators must integrate technology in ways consistent with pedagogical principles. PowToon was used in the study to help students discover their innate ability to use technology in the classroom to help them become more proficient (Nanni, 2015). PowToon is therefore a great tool for ID lecturers to use animations that help students understand and express their creative imagination to capture the content of design processes.

Student Engagement in Higher Education

Student engagement is widely identified as an important issue that has an impact on teaching and learning in higher education as such is being extensively theorized and researched (Issa et al., 2011). In the study of Perron and Steaens (2010), the researcher mentioned that student engagement is the interaction of time, energy, and other relevant resources invested by students and institutions to optimize student exploration to improving student learning outcome and development. In parallel to improve attention on ID student engagement, digital technology has emerged as a valuable element of better education, inherently affecting all factors of the student experience (Barak, 2018; Henderson et al., 2017). Incorporating virtual technologies into the lecture room can lead to profound advances in ID student engagement and learning which can ensure the students are maintaining up with the demand of a technology-based world (D'Angelo, 2018).

Conclusion

The topics discussed above focus mainly on the literature definition and an overview of digital presentation tools in the ID program. Three different digital presentation tools are used to discuss as lecturing tools for the ID process. These three digital presentation tools are 1. PowerPoint, 2. Prezi, & 3. PowToon. Based on the findings, ID students who attended the lecturing class with digital presentation tools will have higher engagement rates than traditional presentation tools. In all three evaluations of Prezi, PowerPoint, and PowToon, a significant difference was found. The result of the literature analysis determined that PowerPoint exhibits instructional effectiveness on long-term learning retention among ID students; Prezi was more effective on visual effects, and information acquisition tends to attract the ID student's interest; PowToon can display videos equipped with animations to help the ID students' innate technology skills become known. The objectives of the research were achieved based on these findings. It is hoped that this research can help ID educators conduct the teaching and learning of the ID process and propose a guideline for further researchers to improve the engagement of industrial design students in higher education.

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