MEDIA ADAPTATION TO IMPROVE THE PERFORMANCE OF STUDENTS IN THE GRADUATION DESIGN PROJECTS

D. Eldardiry¹, I. Elghonaimy²

¹ College of Design, Imam Abdulrahman Bin Faisal University (SAUDI ARABIA)
² College of Engineering, University of Bahrain (BAHRAIN)

Abstract

This research examines how the media and open resources impact design process efficiency in design education. Through the internet, students can easily access the latest e-resources, learn about the most recent architectural and design trends, examine similar case studies, easily get the drawings for their design project, join competitions and awards, and use high technology in their work. These trends encourage students to rethink and look outside the box, opening their minds to profound philosophies that expand their design thinking and helping them to generate innovative ideas and creative designs.

The research includes a two-stage approach to investigating the impact of the media and open resources on manipulation of the design studio, which is an essential part of design education. A theoretical background in the literature provides an understanding of the impact of the media and open resources on the performance of students. This study analyses the data collection and incorporates two methods of data collection. The first involves meetings and interviews with instructors in graduation design studios (architecture and interior design) located in the case studies used by the researchers. The second is a survey questionnaire for senior students. This study measures use of the media and open resources in the graduation design studio. It also measures satisfaction of students regarding their performance on graduation projects. The data reveals the effect of the media and open resources on student performances in the design process used for their graduation design projects in two universities in the Gulf region. One is in the College of Engineering, University of Bahrain, Bahrain. The other is in the College of Architecture and Planning, Imam Abdulrahman Bin Feisal University, Saudi Arabia. The researchers separate the opinions of the instructors and the students in the Gulf universities. The students confirm that the media and the open resources improve critical thinking in design projects, increase creativity, and develop the design value of graduation projects.

Keywords: Media Adaptation, Architectural Education, Creativity, Critical Thinking, Design Projects.

1 INTRODUCTION

There is a growing need to address diverse media impacts on various generations of students, affecting design process efficiency. Using the media and open resources websites, students can easily access the latest e-resources, use high technology in their designs, and generate innovative ideas. Consequently, these resources encourage them to rethink things and look outside the box. Innovative ideas and profound philosophies help students expand their thinking about design. The senior students show independent thinking, especially in their graduation design projects. However, senior students and their instructors have a different point of view regarding explanations concerning the sequence of appropriate methods for the design process. Students increase their dependence on the media and open resources materials in their graduation design projects. The apparent impact of the media and design education websites is to open new horizons for students before even starting the design process.

This research discusses the different opinions of instructors and students in the Arabian Gulf universities. It also explores the impact of the media and open resources on student performance regarding graduation design projects in Arabian Gulf universities.

2 METHODOLOGY

This paper uses a two-stage approach to investigate the media and open resources roles affecting manipulation of the design studio, which is an essential part of design education. A theoretical background in the literature reveals impacts of the media and open resources on performances of
students. Then, this study analyses the data collection, incorporating two methods for collecting data. The first is to collect data from meetings and interviews with instructors of the graduation design studios (i.e., architecture and interior design) in the research case studies. The second is to collect data from a survey questionnaire given to senior students. This study measures use of the media and open resources in the graduation design studio as well as student satisfaction regarding their design project performance. Consequently, the data indicates the effect of the media and open resources on the performances of students in the design process of their graduation design projects. The study then analyses data received on the students and instructors of two universities in the Gulf region. One is the Architecture Program, College of Engineering, University of Bahrain, Bahrain, and the other is the Interior Design Program, College of Design, Imam Abdulrahman Ben Feisal University, Saudi Arabia.

3 THE IMPACT OF THE MEDIA AND OPEN RESOURCES ON DESIGN EDUCATION

3.1 Media for design

The internet offers new and innovative types of media as the most comprehensive way of reconstructing experience of the world. The internet is also the easiest way of exiting one media form and entering another. It's not surprising that most of the media was created by young people with first-hand experience of imagination.

As internet usage has grown, so has the ease of using media and open resources in architecture, letting students quickly access the latest e-resources, learn high technologies, and update software by themselves. All forms of media—speech, photos, architectural drawings, writing, perspectives, models, movies, animations, and the various forms of computer information—have their own features, biases and trends, as well as their own barriers and limitations.

Eldardiry 2013 [1] clarified that the Students can easily discover the advantages and benefits of the various media forms and techniques, which help them stay connected with the community, improve their ability to think creatively, learn from the entire world, and value the society. The media and architectural open resources enhance the learning environment for both students and instructors. These things support students’ characters; help students explore ideas, and develop their abilities. Also, such resources improve the teaching skills of instructors, helping them accept students' new ideas, and motivating instructors to keep updating their knowledge.

The importance of the internet in design education is a well-recognized. “Google it” is a new expression, which means to search for more information about a subject. Bracken 2015 [2] explains that the internet offers a luxury of techniques and resources that provide needed information, such as MERLOT, OWL Purdue, MITOPENCOURSEWARE, OER Commons, TED Talks, Creative Commons, and Virtual Tours & Museums. These sources can provide interesting case studies regarding new teaching practices as well as easily accessible methods for adopting various educations and learning formats. Furthermore, internet technology allows teachers and students to stay informed about what is happening outside of their design world. Eldardiry, and Elmoghazy 2016 [3] explain that It enables both to test their ideas as soon as they are born. The internet provides convenient access to updated information; consequently, it has reshaped higher education institutions by creating new learning environments and new ways to teach. Students in interior design no longer spend their time in the reading room of a library, which still exists, but with different and much broader functions. Using the internet in higher education environments is behind the beginning of a new technology development wave in Arab countries.

Rattenbury [4] explains that despite the current fashionable interest in the relationship between architecture (as a branch of design) and the media, little critical attention is given to the way architecture gets involved in media. One hopes that the process by which people and their works are defined as famous is connected to their inherent merits. But the media form through which this process is achieved is almost entirely through architectural publications, especially magazines and books (and, in a somewhat different form, exhibitions and lectures). These media forms have their own strong drives and tendencies, many of which have little to do with architectural merit per se. To win contemporary fame and a place in history, architects and architecture must make it through a highly biased, highly self-referential publication system. Typically, works first appear in magazines, and then progress through the equally self-determining world of architectural book publishing. The expectation that architectural drawings and models, the product of the architect’s work, must prefigure a work in a different dimension sets architecture apart from other arts. Yet today, the process of
creation in architecture often assumes that the design and representation of a building demand a perfectly coordinated set of projections. These projections are meant to act as the repository of a complete idea of a building, a city, or a technological object. Devices such as drawings, prints, models, photographs, and computer graphics are perceived as a necessary surrogate or transcription of the built work, with dire consequences for the ultimate result of the process. Perversely, the architecture represented in the media does seem to prove the very claims by the architectural world about media influence. More media coverage does generate more public debate and influence public opinion. It even seems to play a very strong role in the decision-making process of high-profile planning decisions. It can be argued that the attack did put architecture definitively on the agenda, catalyzing—after the first wave of broadly hostile coverage—a steep rise in media and public interest in architecture and design throughout the 1990s. This culminated in a great wave of home makeover shows and fly-on-the-wall studies of the ups and downs of building projects, from self-build housing to Tate Modern.

### 3.2 Open resources for design

Locus [5] is one of the architects most interested in the ways open sources can be used in architecture, urbanism, and design. He is the hub for open source architecture and collaborative design, and is developing a platform to empower people to share their knowledge and get more creative, online collaboration and collective intelligence. Consequently, He confirms that the world of architecture does not change as quickly as software, but architects are still finding new ways to share innovative designs and ideas. The open source architecture movement aims to make architectural designs, drawings, 3D renderings, and documentation freely available for integration into other projects under open source licenses. It owes much of its growth to the increasing popularity of the maker movement, DIY culture, 3D printing, and CNC machines, as well as support from some international architects interested in open sources like Alejandro Aravena.

There are a lot of open source architectural elements which include some of the most important projects. For instance, Locus [5] explains that Wikihouse is an open source construction system that uses CNC machine-cut wood panels to build homes and other structures. Opendesk is a group of UK-based designers who share their furniture designs under a Creative Commons license. AKER is a branch of Open Source Ecology that aims to develop urban agriculture and make it easy for everyone to cultivate their food. The Bricks open resource seeks to be the GitHub of open source architecture projects, making it easier to find and contribute to new projects. Elemental is an architecture studio created by the renowned Chilean architect Alejandro Aravena. He recently published AutoCAD DWG files for four of Elemental's public housing projects under Creative Commons licenses. Paperhouses publishes open source home projects designed by talented architects worldwide. Its aim is to popularise high-quality home designs and fight against the low quality of construction in many suburban areas. Antonelli 2011 [6] Domus is an Open Source Architecture (OSArC), which proposes that for a different approach to designing space to succeed, the single-author model must include tools from disparate sources to create new paradigms for thinking and building.

Center for media literacy (CML) [7] represents that the Critical construction of media is a vital and necessary step towards digital citizenship and full participation in our media culture. In this issue, Al-Solaiman [8] discusses the involving of the media construction for the people, and demonstrates how the Media constructions involve numerous parties of different nationalities and cultural backgrounds using varying design methods. Therefore, examination of media constructions allows the reading of the same project from different angles in relation to somewhat equal parties. And although the facts are more or less constant among them, some of these facts are accentuated or given center stage because they are either pertinent to the design or are expected to appeal to the readership of the magazine. The framing of the information is also always in relation to the architect's country.

Because of the impact of media and open resources, students are Learning via media and open resources gives students the opportunity to explore the latest trends in their designs and communicate with others from different cultural trends. It is impressive to see how students interact with social media, learning about different cultures and ideas. It is obvious that they are not simply receiving delivered information but also need opportunities to participate, criticize, interact, and design their own concepts and ideas.
4 CREATIVITY AND CRITICAL THINKING IN DESIGN EDUCATION

Bloom's taxonomy is a classification system used to define and distinguish different levels of human cognition: thinking, learning, and understanding. Educators have typically used Bloom's taxonomy to inform or guide the development of assessments [9]. The layers of the revised Bloom's Taxonomy contain levels of learning, with each layer representing increasing complexity. The top layer, layer six (creating), puts all the layers together in a new way with products such as architectural and design projects.

Designing architectural and interior design projects examine the highest level in the revised Bloom's Taxonomy, which is creativity. Experts did not recognize the steps of the creativity process until the late 19th century. Edwards, 2007 [10] discuss the increasing of the number of creativity steps throughout the next century, and developing the concept of creativity from simply solving problems that continually arise in human life with new ideas about the process of searching out and discovering problems to solve that no one else has perceived. As Albert Einstein and Max Wertheimer stated, 'to ask a productive question is a creative act in itself'. The "brain-based learning" theory states that the brain retains its plasticity (the ability to rewire itself for better function) throughout life. El-Wakeel [11] confirmed that this learning theory is based on the structure and function of the brain. Simply, it can be stated this way: As long as the brain is not prohibited from fulfilling its normal processes, learning will occur. This type of education provides a biologically driven framework for teaching and learning and helps explain recurring learning behaviors. It is a meta-concept that includes an eclectic mix of techniques. Except for Gestalt psychologists (for whom creativity is an un-segmented process), researchers have agreed on the basic concept that creativity involves five progressive stages which occur over varying lengths of time. These stages are:

- First Insight. A preliminary stage of problem finding (a term that encompasses both problem solving of the existing problem and problem finding for asking a new productive question).
- Saturation. The stage of research.
- Incubation. The mulling-over or thinking over stage.
- Illumination. The sudden solution stage, or the birth of the idea.
- Verification. A final stage that puts the solution into concrete form while checking it for errors and usefulness.

These stages progress from one to the next. Each stage may occupy varying lengths of time. The Illumination stage is in almost every case reported as being brief a flash of light thrown on the subject. Also, one project may require repeating the cycle of stages. Critical thinking (CT) has gained increasing attention in design education. Indeed, teaching CT is an essential element of professional and higher design process, as it promotes reasoned judgments under conditions of doubt that is a hallmark of professionalism. Researchers have defined CT in various ways. Choy & Cheah, 2009, (p.198) [12] defines CT that it is ‘reflection, identification and appraisal of assumptions inquiry, interpretation, and analysis and reasoning and judgment with the consideration of context’.

Al Ghamdi and Deraney 2013 [13] collect the definitions of CT in their literature from different sources. Our definition agrees with that of the National Council for Excellence in CT Instruction (NCECTI) (Scriven & Paul, 2003) [14], CT is “the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing or evaluating information gathered from or generated by, observation, experience, reflection, reasoning, or communication as a guide to belief or action” (p.34). Another definition by Halpern, 1997, [15] is that it is viewed as purposeful, involving “the use of those cognitive skills or strategies that increase the probability of a desirable outcome” or as “the process of analyzing, evaluating and synthesizing information in order to increase our understanding and knowledge of reality” (Sievers, 2001, (p.12) [16]. Various studies highlighted the significance of CT in higher education. In one study, Egege & Kutleleh, (2004) [17] argued that: Although CT has always been viewed as a necessary attribute of all successful tertiary students, there has been an increasing emphasis in recent years on the overt acquisition or teaching of CT skills, with most academic disciplines now making this requirement explicit. There is no longer an assumption that students will acquire the skill in the normal course of their academic degree. Subject topics specify the need for a critical approach or evidence of CT by including the role of critique, critical reflection, or critical analysis in their course outlines. Essay questions clearly state that critical analysis and evaluation will be a part of their grading (p.76).
Architecture and interior design need very special capabilities, such as intelligence. Students in this field also need to be creative thinkers. They are always required to manipulate the information they get from their research and in class, and then convert them to creative aesthetical and functional ideas. This manipulation, which is called the creative process, takes varying lengths of time. It also needs a lot of concentration and effort, which leave the student emotionally involved, stressed, and frustrated if he or she could not reach the illumination stage soon enough.

In the last decade, the influence of the internet, media, and open sources has had a strong impact on the practice of brain-based learning, problem-solving, expansion of horizons, and creativity in architectural education and interior design in many countries around the world, especially in the Arab region. This openness in a globalized world impacts the ease of providing modern and high technologies that can easily reflect the ideas of innovative students, reducing the amount of physical stress on students and increasing their ability to access educational learning outcomes and objectives of architectural projects in the easiest and fastest way.

Fifth-year students in architecture and interior design programs are in the final step leading to real-world careers. They ask themselves about the ways to put the experience and technical skills gained during their five years of architectural education into the design of their graduation projects. This concern stems from the fact that they choose their graduation projects, which are not imposed on them by instructors. Students want to highlight their talent and skills, and show creativity potential gained from their years of education. Therefore, students working on graduation projects must combine all the information they have obtained through both electronic and non-electronic methods to collect data. They must then interpret that data to produce an excellent graduation project and establish a concrete base to support a future in the field of architecture.

5 CASE STUDIES IN THE GULF UNIVERSITIES

Academic design programs in the Arabian Gulf universities are now making serious attempts to raise performance levels and upgrade the entire educational process design. These programs work on raising the efficiency of graduating students and qualifying them to deal with coming developments in the next century by opening them up to the digital world, using modern high technologies, and accelerating their participation in universal competitions and social events. Therefore, in this research, we focus on evaluating the effectiveness of usage by students of media and open resources in design education in two different design programs in the Arabian Gulf universities: The Architecture Program in the College of Engineering, University of Bahrain, Kingdom of Bahrain, and the Interior Design Program in the College of Design, Imam Abdulrahman Ben Faisal University, Kingdom of Saudi Arabia.

5.1 Architecture Program, College of Engineering, University of Bahrain

The University of Bahrain is a leading governmental university in the Kingdom of Bahrain, with more than 30 years. The College of Engineering has been in existence since 1968. The Department of Architecture & Interior Design, College of Engineering, offers the undergraduate program. This program has received the Sustainable Equivalency Form from the National Architectural Accrediting Board (NAAB). The 170-credit Bachelor of Science in Architecture program begins with an introduction to basic design principles and graphics practices. These will enable students to produce effective design communications. The program evolves from the first year to the fifth year around the core activity of design. Design activities progress from a simple small-scale project to a large and complex project in the final year, which is the graduation project. Students learn to design a variety of projects from a simple house to complex buildings like hospitals and hotels. They learn to understand social, cultural, psychological as well as physical and environmental forces that influence the creation of spaces and structures [18].

The course description of the graduation project aims to develop a comprehensive, in-depth analysis of a given architectural design problem based on basic principles of design research and critical thinking applied to the understanding of buildings as a reflection of social, cultural, economic, and political factors allied with functional and technical needs. It also aims to develop a comprehensive architecture project based on the programing defined in Graduation I. The purpose of graduation projects is to create a comprehensive architecture project which reflects the student's creative identity, critical thinking, and complete understanding of the complexities related to building construction.
5.2 Interior Design Program, College of Design, Imam Abdulrahman Ben Faisal University

Imam Abdulrahman Bin Faisal University (Previously King Faisal University) opened its doors in 1975 with two colleges, the College of Medicine and the College of Architecture and Planning, in the Eastern Province in the Kingdom of Saudi Arabia. The interior design program, which is related to the interior architecture program, was established from the beginning as a separate department in the College of Architecture and Planning. Since 2009, it has become a nucleus for establishing a College of Design, which is made up of three departments: Interior Design, Graphic & Multimedia, and Product Design.

Interior Design is a five-year program and is logically sequenced to provide systematic learning and reinforce important concepts as students proceed through the program. The undergraduate curricula in design are divided into two phases: A pre-professional program that all students attend in the first year, and a professional program for the next four years that starts in the second year. Students will receive their bachelor degrees after they have successfully earned 166 credit hours and have completed all practical training requirements.

The vision of the College of Design is to prepare students to become innovative designers with the capacity to apply aesthetic and intellectual vision to the expression of complex ideas; to push the boundaries of creativity while gallantly holding to significant and time-tested tradition; to connect international experience with professional education; and to integrate technical skills with theoretical understanding [19].

The course description states the graduation design project is based on the cumulative knowledge and skills developed in all previous design studios, course work, and professional experience. A comprehensive real world design project integrates programming, research, and design processes as well as graphic, verbal, and written communication, using information, preliminary zoning, and the program developed in the senior thesis research foundation. Students will investigate a problem from concept generation to design development and detailing. Their outcome should congregate and utilize their five years of study and design capabilities in a final project reinforcing specialized knowledge.

6 DISCUSSION

The researchers aim to investigate the impact on students in graduation design projects in two Arabian Gulf universities from a usage of the media and open resources to develop their satisfaction in designing the graduation projects. To start, researchers choose two types of design programs related to architecture. While the first is the Architecture Program in Bahrain, the second is the Interior Design Program in interior architecture in Saudi Arabia. These programs share similar qualities regarding problems encountered and obstacles to the application of the relative social and culture similarities in the circumstances for the same community. Therefore, the exchange of studies and research in this field between different universities benefits everyone.

In the research, the first method of collecting data was the instructors’ meetings and interviews in the graduation design courses in the two programs. The researchers investigate the power of the media and open resources on the students in teaching the graduation projects for the last three years. The instructors (four instructors in the architecture program and three instructors in the interior design program) confirm that today, media and open resources are very important and essential resources for students. From experience, they confirm that media and open resources enable students to take design processes and techniques to a higher and more professional level. Also, students can improve their creative and innovative designs to reveal the level of their skills and knowledge acquired during undergraduate studies. Using media and open resources in teaching and learning processes helps students acquire a methodology of critical thinking they can use in their graduation design courses, especially regarding design value and creative solutions. Through studying similar case studies for the project, learning about the latest architectural trends, and participating in competitions and awards, students learn how to think outside the box. These activities help students extend their vision to implement ideas from different cultures, recreating them to add value to their projects.

The researchers begin by discussing the explosive growth of Internet access and among the design education and move on to introduce the tools methods with which authorities’ attempts to gain the required data and the flow information through the media and architecture open resources. As media and open resources have become more freely available, the students involved in design education have found that a vast number of digital data, drawings, and projects are available from many sources.
The instructors of graduation design projects in the case studies are using the Internet in their courses, and thus the extent of using the media and open resources available in digital format is growing. Consequently, they help to address the problem of the missing data by improving the information resources.

There are two types of e-resources in the media and open resources, official and non-official resources; in recent times, much of the drawings and information of the project in the official open resources are locked up behind passwords within proprietary systems. However, there is little architecture open resources aim to break down such barriers and enable sharing drawings and data information freely. The nonofficial resources have the major effect during public. These open resources encourage exchanging the drawings, images, techniques, knowledge, figures, tables, documents, and implementation resources. When the students' search strongly berried with the locked information in the official resources, students were more likely to get the information from the nonofficial resources like social media (Facebook, Instagram, Snapchat, Twitter and YouTube) than the official resources. Thus, it is likely that nonofficial media have a greater potential to influence social behavior during public searches.

The second method of data collection is a survey questionnaire given by the researchers to the students in the graduation design studios at both programs; the Architecture Program (ratio 50% = 40 students) and the Interior Design program (ratio 90% = 17 students), to measure their perception of how much the media and open resources effect their designs in the graduation design projects.

Researchers divided this questionnaire into two parts. In the first part, the researchers investigated the power of four main items according to suggestions from the design course instructors, to arrange the advantages of the media and open resources for the design project according to importance. They classified the advantages into four choices; studying similar case studies for the project, learning about the latest architectural trends, opening to competitions and awards, and the Easy to get the drawings for the design project. The results show 85.7% of the students confirm that the most important benefit is examining similar case studies for the project. The lowest important is the opening to competitions and awards, the second is learning about the latest architectural trends, then the Easy to get the drawings.

In the second part of the questionnaire, answers reveal that 96.43% of the students confirm that the media improves critical thinking in design projects; 85.71% of the students confirm that the media increases creativity. Also, 89.29% of the students confirm that open resources improve critical thinking in design, and 78.57% of the students confirm that open resources increase creativity.

Students prefer non-official websites such as social media to gain the needed data and information because on these platforms it is easy to communicate, find needed case studies, and follow the latest architectural trends, which are quickly spread by social media and accessed through mobile phones. These social media include images, photos, drawings, new materials, and technical issues for architectural projects. In these social media, different levels of opening resources can be distinguished, they involve access and accessibility.

Only 15% of the students in the two programs, looking for excellence, make a lot of effort to search for official open resources to gain data and information that translates into uniqueness in their design projects. The main constraints in using the official open resources are learning resources that can be used but are located behind passwords in institutional websites and not available to external users. Constraints can also be economic; such as the price of access. Also, can be limit access for copyright and ethical standards and privacy reasons. Also, accessibility can depend on individual capabilities; for example, the content may be freely available in a language the user does not understand. The official media and open resources need more procedures for security.

The students look forward to being able to communicate through easy logging on to the websites freely. Because the media and open resources provide advantages like high-performance materials, high technology, and access to emerging fields that are quite promising in design education, students have the chance to support their critical thinking abilities and improve their talent and creativity to show excellent design skills in their design projects. So, indeed, instructors should respect their students’ ways of thinking, helping them to improve their ideas and recreate their vision.
7 CONCLUSIONS

The media and open resources lead surprisingly interesting actions and productive activities. These entities can function efficiently, almost like information ‘workers’ plugged into global digital design projects. Students can access and easily refer to media and open resources through online accounts, communicating as they wish, and they can study real life and suggested digital projects through online transactions. Using these resources, it’s easy for students to examine similar case studies for their projects, learn about the latest architectural trends, get drawings for their design projects, join competitions, and receive awards. Students can bring architectural projects from digital resources to visual reality, and they can even operate a wide variety of online devices. Students can inspect their surroundings through webcams, and they can download text, music, and video files for their architectural projects. Also, for social interaction, they can join online communities, chat rooms, instant messaging, and even shared virtual worlds and online video games within which they can represent themselves in multiple ways.

The senior students in design education are in the last step of their education before going out into the real world of professional life. As such, they want to put all their experience and technical skills into building their graduation design project. They choose these projects themselves as an expression of their innovative talent. Through their undergraduate years studying architecture and interior design, students learn a variety of skills, refine their critical thinking to create and develop particular talents, and gain a better understanding of the creative process.

Accordingly, decision makers should build their programs based on intercultural engagement and be able to teach students how to benefit and filter the new implications of the world’s culture to interact with it without abandoning their own. Furthermore, decision makers should also consider the opportunity of ‘giving’ and influencing in addition to ‘taking’ and earning, and by that, they should operate like interactive individuals the world will look to and benefit from. Communication technology is not about the substitution of cultures, but about interacting with all partners.

REFERENCES


