

CURRICULUM IN PROGRESS: DEVELOPING AN INDUSTRIAL DESIGN PROGRAMME FOR FEMALE STUDENTS IN SAUDI ARABIA

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ABSTRACT

This paper discusses an Australian curriculum development project for Industrial Design (ID) female education in a Muslim country. In a first step, we provide background information about key issues relevant for this project, ranging from the interplay of curriculum development, education and culture to specific features of contemporary ID education. We present the findings of a review of current undergraduate ID curricula worldwide, used in the formation of the intended curriculum, with an emphasis on the need to integrate local industry into the curriculum and the educational experience of the female students. Then we report and discuss the implementation of an ID curriculum in two different contexts, Australia and Saudi Arabia. We conclude with a reflection on what we have learnt during the course of this project and possible next steps.

Keywords: Curriculum development, female-only education, Industrial Design, Islamic context, Saudi Arabia.

1 INTRODUCTION

This paper describes the process and considerations for the development of the curriculum for the first female-only Bachelor of Industrial Design (ID) (aka Product Design) programme in a College of Design in the Kingdom of Saudi Arabia (KSA). We first discuss general aspects of curriculum development, education and culture, followed by specific features for contemporary ID education relevant to the context. We also present the findings of a review of international ID education and, at the same time, point out the importance of the integration of local industry in Saudi Arabia. In a second step we focus on the implementation of an ID curriculum in two different contexts, Australia and the KSA. We conclude with a reflection on what we have learnt during the course of this project.

2 BACKGROUND FOR THE CURRICULUM DEVELOPMENT

2.1 Culture, Education and Design

In 2012, during a conference in the Kingdom of Saudi Arabia (KSA) the Dean of a female-only College of Design approached the lead author to help them plan and establish the first female Industrial Design programme in KSA. After three years of planning and negotiations, the curriculum was developed in 2015 by a multidisciplinary team of ID educators, curriculum developers, educational technologists and applied linguists. For this purpose and within the spirit of co-design, many discussions and research focused on topics such as culture, religion, the focus on female-only education, and their possible influence in ID education. Furthermore, cultural as well as language differences provided challenges and learning experience for the team. This paper briefly describes some initial aspects of this project in progress.

Culture, education and design are closely interrelated. Fincham and Rhodes (1994), as cited by Razzaghi and Ramirez (2009, p.440) [1], explain that “*culture* is an anthropological term referring to the fundamental values, beliefs and codes of practice that make a community what it is. The customs

of a society, the self-image of its members, and the things that show it as different from other societies constitute its culture". Culture is learned, not inherent, so the process of *education* is a process of *acculturation* (or the cultural change resulting from the meeting of diverse cultures).

Cultural aspects are especially relevant for the various disciplines within design both in practice and in education. In the practice of ID, and within an anthropological perspective, we understand culture by studying the artefacts made and used by a group of people. Artefacts help us to understand a culture; thus, ID practice is an active creation of culture and meaning. While cultural aspects are fundamental in design practice, some authors suggest that globalization has caused homogenization and lack of diversity in design, as well as standardization of design education (Norman 2012) [2], as design curricula around the world are almost identical. Furthermore, Razzaghi and Ramirez (2009, p.440) [1] found that a majority of design courses suffer from a lack of subjects related to the links of design and culture. This was very important in our project, due to the specific context of this ID program. In view of this, we purposely included dedicated units to explore the roles of Saudi Arabian cultural identity as applied to ID, and related to art and craft in their region and culture.

2.2 Contemporary ID Education

ID practitioners work today in almost any manufacturing industry, within what has been defined as a traditional *design for manufacture (DFM)* approach. However, today, the scope of ID education and jobs involve diverse disciplines with "*softer*" aspects of design (Trathen and Varadarajan 2013) [3]. Contemporary ID has dematerialized the product, having as its aim the design of *systems, services and user-experiences* rather than merely *physical products or manufactured goods*. Furthermore, new technologies have allowed ID graduates to practice as *digital makers, game designers, app designers*, and others.

With this change in scope of ID practice comes a parallel change in the educational needs and practices of tertiary education including the increased need for research opportunities and outcomes. There are a number of approaches and foci of ID education within and between various cultural and geographical locations as exemplified by the range of papers published in, but not limited to E&PDE conferences proceedings, by authors based in many different locations around the world (eg. Connor and Beckwith, 2014) [4]. Gender issues are also a relevant topic within the education of IDers. Traditionally perceived as a male dominated profession across the world, universities have to engage with an increase in women's participation in courses and their needs and expectations of future practice (Lockhart and Miller, 2014) [5].

In order to adequately plan and design a relevant female-only ID curriculum for Saudi Arabia, it was important to consider the broad range of career paths ID graduates follow today, and extrapolate these to define a professional profile of the female graduates of the Saudi Arabian College of Design. In consultation with female staff from the college, this determined the focus, mission and vision of the ID program. Through discussions with staff and local potential employers about the needs of industry and job scopes for future female graduates we determined that the ID program for the KSA College of Design would have a strong engineering focus. This was somewhat contrary to our initial perception of what a female-only ID course in this context could be. A strong emphasis in entrepreneurship and strategic design was also important, and it is expected that these will play increasingly important roles. An important feature of contemporary ID education is its technical and technological requirements. The digital future for ID is one where teaching, learning and research promote innovation and creativity through the ability to easily design and bring new ideas into reality for testing and verification through 3D digital printing, commonly referred to as rapid prototyping (RP). This is a place where the studio and the *digital* workshop seamlessly merge into one and now the status quo within most, if not all ID professional practices. Therefore the digital studies in the curriculum for Saudi Arabia were designed to ensure the future graduates are a part of this digital future. In the curriculum for our Saudi partner, computer knowledge and skills were introduced into the first year of the course and Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) were presented in the following years. The early introduction of these ensures that students become accustomed to working seamlessly with both traditional and digital methods. Digital and traditional aspects thus constitute integral parts of the students' design process.

2.3 Forming a Foundation of ID Curricula

ID ranges across the arts and the sciences in a broad range of programs and curricula. It is also sometimes equated to similar courses (such as product design, product design engineering, industrial design engineering, etc). With the introduction of softer design approaches and the contemporary relevance of *design thinking* and *multidisciplinarity*, many variations of ID related design courses have also been developed worldwide, sometimes with different names or branded as multidisciplinary *integrated design* courses. In order to gain an adequate and up-to-date understanding of ID and related design curricula in the global context, we conducted a review in which we surveyed 60 top design schools worldwide, extrapolating the top design school lists from sources such Businessweek (2007) and Business Insider (2012). For this specific project, we selected 6 key examples of 3, 4 and 5-year undergraduate (UG) programs from this selection of widely recognized international design schools, whilst also considering geographical diversity (USA, Europe, Asia and Latin America). Figure 1 below captures our findings from this review on how approaches vary from the aesthetically oriented art schools to the technologically focused design schools. Furthermore, some of the most recent and successful design schools, such as the D-School from Stanford, are now connected to business schools.

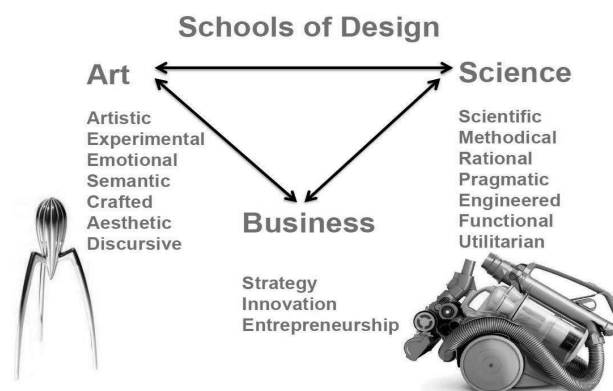


Figure 1. Approaches of ID related Design Schools

The different approaches of design schools also vary according to different countries, their manufacturing industries, and their needs, although many design curricula are still based on the now classic principles of the Bauhaus and the Ulm school. For example (and over-generalizing), many engineering-focused ID schools follow a German tradition, while many art-focused schools follow a more experimental Italian tradition. Australia is known for a *DFM* approach, with a very strong *hands-on* and technical background. Furthermore, and according to the availability of local industries and industry-academia collaborations, while in developed countries many ID courses focus on the design of products, in many developing countries ID is also strongly related to the crafts, supporting traditional artisans. The range of undergraduate (UG) programs equivalent to a bachelor's degree varies in different countries from 3 year courses to 5 year courses, with a 4 year course being most popular world-wide. Post-graduate (PG) programs also vary, from one-year honours or one-year intensive master's courses to the more widely accepted two-year masters. This variety allows for different structures and education pathways, which include but are not limited to:

- **Structure 1:** 3 year UG + 1 year honours as separate degree (recently adopted by some Australian Universities)
- **Structure 2:** 3 year UG + 2 year compulsory masters (European Bologna model)
- **Structure 3:** 4 year UG
- **Structure 4:** 5 year UG

Furthermore, many countries including Australia, Singapore and the United Kingdom among others, have technological or vocational education providers (many times known as polytechnics) or private institutions (colleges). These offer ID and related courses that range from two to three years, which can allow for articulation for further studies in a university (tertiary education). Due to the required duration for the program in the KSA (5 year undergraduate, similar to structure 4 above, but with an initial Preparatory year which is common for all university studies), the closest curricula to the one we

proposed was found in Latin American Universities, in countries like Brazil and Colombia. These findings, plus the consultation with the Saudi Arabian college Dean, female staff and future potential employers, was the basis of this multidisciplinary project, where ID educators, language educators, curriculum developers and educational technologists from different cultural backgrounds collaborated.

2.4 Exploring Links with Local Industry in Saudi Arabia

A site visit to the partner university and their College of Design helped with brainstorming and discussions about the curriculum design, whilst fostering links with local industry. A main need identified in local industry was the adequate use of CAD with a focus on engineering. For instance, a local industry pioneer in employing women currently employs Interior Design female graduates to do product design (having to re-train them in-house, in CAD suitable for product design).

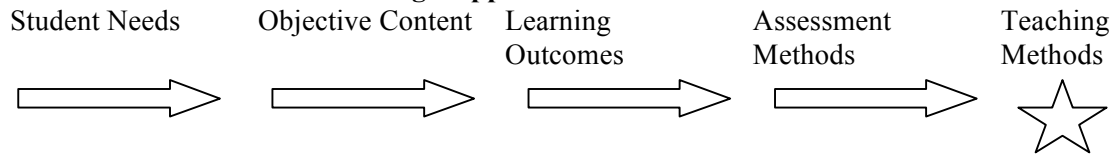
There is no government institution to protect traditional crafts in the KSA, but local galleries commercialize local crafts, while supporting young artists and designers. These institutions were identified as good potential partners to explore Saudi cultural identity through design, and to foster entrepreneurship. For example, students could sell their products through the gallery, as currently occurs with products by local graphic designers and artists.

3 INTERPRETATION AND IMPLEMENTATION OF CURRICULA IN THE AUSTRALIAN AND THE SAUDI ARABIAN CONTEXT

Designing a curriculum for other cultures is always difficult; often there are complexities around understanding a different system, the curriculum goals – broadly as described above, or in the detail. The international review and the exploration of local industries helped us to address broader issues. Here we explain key details, particularly some of the constraints that were run up against, and conditions that had to be taken into account (AAAS, 2001) [6], such as the number of credit hours a class should run for (number of contact hours per week as well as hours of private study) and what should be included in the assessable items – such as in this case each course had to include a 5% attendance mark. We also discuss the expectations for completing the various sections of the curriculum documents – the different interpretations of Bloom’s taxonomy (1956) [7], the differing use of constructive alignment (Biggs & Tang, 1997) [8] and cultural perspectives on knowledge construction (Boyer, 1990) [9]. As an example, we discuss the differing use of constructive alignment in more detail below.

The use of constructive alignment in Australia (Biggs and Tang, 1997) [8] is similar in Saudi Arabia, but for the Saudi curriculum the focus is on learning outcomes and assessments that are measurable, observable, meaningful and independently verifiable (NCAAA, standard 4) [10], “student assessment processes must be appropriate for the intended learning outcomes and effectively and fairly administered with independent verification of standards achieved”. This added a level of complexity not often required at universities in Australia, other than perhaps for professionally accredited courses. Also, in the development of the curriculum, a greater attention was required on the development of assessment – a reversal of how constructive alignment is typically used in Australia, where teaching methods and activities are set prior to the design of assessment tasks. From the instructions found (Maffet & Zakaria Murshid, 2012) [11] and in the format of the documents, it became clear to us that in Saudi Arabia the teaching strategy and methods were dependent on the assessment methods – this is more in line with curriculum design known as *backward by design* (Wiggins & McTighe, 2005) [12] where assessments are designed first and the teaching methods are decided afterwards. Figure 2 below shows the 2 different approaches:

Saudi Arabian Curriculum Design Approach:



Typical Australian Higher Education Curriculum Design Approach:

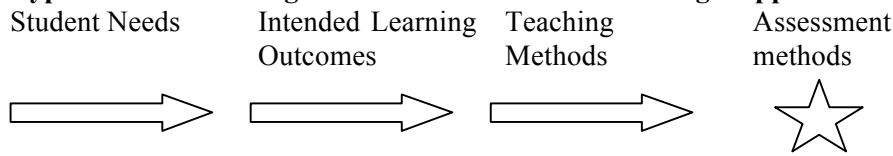


Figure 2. Curriculum Design Approaches in Saudi Arabia and Australia

In Australian Higher Education, *content* is not included as a focus of curriculum design, where it is assumed that this will be covered. What is given greater prominence, and often reflected in graduate outcomes, is the ability for students to be able to engage in higher order thinking skills. Understanding that the content knowledge was a primary focus of the KSA Knowledge Domain, reflected in the focus on Bloom's knowledge and comprehension domain categories, helped us writing these more specific learning outcomes at the course level.

4 WHAT WE LEARNED THROUGH THE PROCESS

Developing the curriculum for the first female-only Bachelor of ID programme in Saudi Arabia has been a very rewarding experience. The development of a course to be delivered in a distinctly different culture, and to female students only, also had its challenges. Interestingly, what we considered to be a major difference when we started the project, the segregation of females in a Muslim context, turned out to be less of an obstacle, at least in the development phase of the curriculum. Furthermore, colleagues questioned the ethics of the project, but the team saw this as an opportunity to contribute to design education, and open new career paths and empower female students in KSA.

Our *interdisciplinary approach* helped us complete our task to the full satisfaction of our Saudi partner. Such an approach also requires a project team that has expertise across *ID*, *curriculum development* and *culture*. None of the project team members could have developed the curriculum on their own. A second aspect of this curriculum development project was *continuous communication and exchange* with the Saudi partner. Without this we would have developed a curriculum that would not meet the needs of the students in their particular context. Having an open mind and a willingness to learn about the Saudi cultural and religious context were equally important for this project. Because of the strict segregation of females there were restrictions, for instance in the way a male Australian colleague would communicate with female staff at the College of Design during his field-trip to the KSA. This will also have implications for design studies, for example approaching human body drawing and measurements. While anthropometric data already exists and is available worldwide, in-class measurements of the human body for anthropometrics and ergonomics studies would in this context have to be female-only.

Language related issues, such as our and our Saudi colleagues' understanding of specific terms (such as what constitutes a subject, a unit or a course) and, more importantly, our respective and differing interpretations of theoretical models (for instance of constructive alignment, learning outcomes, or assessment) added to the complexity of our project. Perhaps most importantly, developing a curriculum for another university in a different cultural context and as female-only has allowed us to critically reflect on the ID curriculum at our university. For instance, our own curriculum has benefitted from the international review conducted and curriculum development project, with recent inclusion of *softer* approaches to ID (service and user experience design), new emphasis in business and entrepreneurship aspects of design, as well as studio projects that include exploration of *Australian Cultural Identity*.

Our Saudi Arabian partner started teaching their first cohort of female students in late 2015, and we look forward to future collaboration with them. We aim to further explore and understand how this curriculum is implemented and evolves in the particular Saudi context. Part of the future research of

this ongoing project will include interviews with both the female staff and students in the College of Design in KSA. The aim is to understand the challenges and their aspirations within foreseeable career paths and provide further insights regarding the evolution of female ID education and practice within the Saudi Arabian context.

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