

Crafting Digital Strategies: Empathy, Technology and Design Education

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Abstract

“Designer of 2015”, a report published in 2009 by the AIGA, generated a series of competencies for future designers and outlined the impact implementation of these competencies would have on the future of design education. Among these, the research mentions experiences, systems, and services as new trends in design education. These design competencies go beyond the creation of single design artifacts and into the creation of multilevel strategies. The value of these trends have been reinforced by the International Council of Design and the UK Design Council. Another consideration in designer competencies is empathy.

Endeavoring to embrace empathy as a valuable design tool has gained importance in design education. Empathetic design as a design process, adopts the understanding of people (*users*), not only based on their specific needs, but also in their relational contexts, constraints and general understanding of their world.

This paper will focus on the work created by students from several design courses at the College of Arts and Creative Enterprises at Zayed University in Dubai. In these courses, empathetic design was used to develop strategies that rely on the creation and use of technology with outcomes such as mobile applications, digital visualizations, or even gadgets. The student’s projects were classified under three categories: empathy through game mechanics (*gamification*), empathy through business models (*monetization*), and empathy through digital companions (*facilitation*). The three categories were defined based on patterns found in student work submitted in the past two years. The works presented here show that project-based learning and empathetic design allow students to conceptualize complex strategies that solve specific user needs. The outcomes will be discussed in this paper, as well as the implications of students as generators and creators of new technology and mediums instead of being only technology consumers.

Keywords: *Empathy, Design Education, Interaction Design, Digital Media*

1. INTRODUCTION

By definition, design seeks to solve specific problems through the use of creative means, while conceiving purposeful solutions. These creative means divide design from other practices as they are acquired by students in workshops and studio courses. This “*studio*” approach is originally based on the curricular structure defined by Walter Gropius, director of the Bauhaus in 1920’s. During this era, the center of all learning activities was the notion of “building”. Students experimented with basic concepts such as color, shape and material in the first year of training and then moved into specific skills by executing practical work at workshops and studios directed by Johannes Itten, Paul Klee, Josef Albers and László Moholy-Nagy (**Fig. 1**). This type of formative training encouraged students to present their own designs, while moving away from the idea of copying from models and being repetitive apprentices. However, design education has evolved greatly since the times of Gropius and several pedagogical models and methods, have appeared based on different cognitive theories.

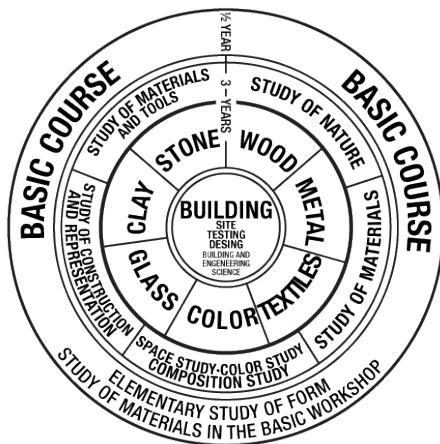


Figure 1. Diagram of the Bauhaus design curriculum. Graphic adapted from *Design and Form: the Basic Course at the Bauhaus* by Johannes Itten (1936).

In a recent survey, Maya and Gomez presented a compilation of contemporary teaching models used in design education that reveal a diversity of methods used in the education process. (Maya & Gomez, 2015). Some of these models have epistemological origins such as *Situated Learning*, based on interactions between the learner and the environment, or *Systems Thinking* that seeks to explore nonlinear thinking starting from the evaluation of complex problems and then onto each of its elements (Brown et al, 1989, Park & Benson, 2012). Other models are based on educational trends like *Learning by Doing*, based on the reflection of outcomes and stimulating iterations of a single solution, and *Problem Based Learning*¹ where knowledge is acquired by the student as needed. (Trowsdale & Clark, 2013,

Ovesen, 2013). Other educational models have origins in art practices, neurological studies, or engineering (Maya & Gomez, 2015).

Independent from its origins, the future of design education presents challenges as the practice is rapidly shifting and being heavily influenced by technology,

¹ According to Ovesen (2013), the problem-based learning model encourages the students to take a rather active role in organizing their own time and study activities. It also forces them to independently track down the specific literature and other sources needed in order to work their way around the given tasks and thereby meeting the learning goals of the particular semester.

new macro-economic trends, and cultural paradigms (Bennett & Vulpinari, 2011). These challenging aspects impacting design education account for the changes that need to be addressed: moving from artifacts to services and experiences, but also adapting to new contexts (Dubberly, 2011). This is leading to a multidisciplinary approach, where the design student becomes a strategist able to think in artifacts created for the digital realm (screens, multimedia, and dynamic content), but also taking into account the experience of the human user.

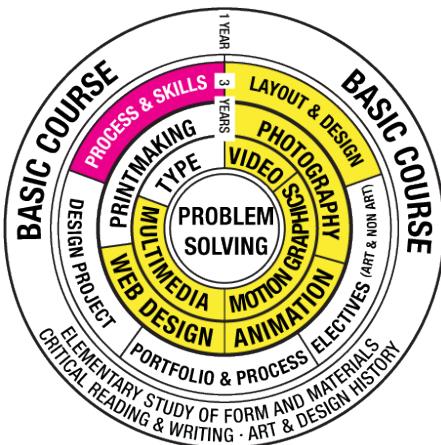


Figure 2. Current design curriculum. Adapted from *Big Bang technology: What's next in design education, radical innovation or incremental change?* Fleischmann (2015). In yellow subjects that relate to technology. In magenta, empathy inside design process and skills.

This approach was briefly described in early 2009 by the AIGA in their *Designer of 2015* article, a report that outlined a series of competencies relevant to future designers. Among them were the ability to use basic design principles, such as typography, hierarchy and the capacity to solve problems based on research by using prototypes, and other means of testing. The article highlighted the importance of having an empathetic user-centered approach in which the solution is related to cognitive, social, cultural, economic, and technological contexts. Technology has particularly impacted design education, and this is reflected on the way design programs have been expanded in the past 15 years to include subjects related to technology and new media (Fig. 2).

For this paper, a *Digital Strategy* is defined as a design concept in which technology facilitates a specific task. This way, the intention is not for the student to create just the mockup and application of the technology, but to understand the user, the needs, the technological requirements, the outcomes, and the real-world application of the idea. Considering this, three types of technology-centric empathy modes are presented: *Game Mechanics*, in which students generate empathy through mobile games. *Business Models*, in which empathy allows the student the creation of a business concept that involves a digital medium. The last strategy is *Digital Companions*, which facilitates empathy when the student generates an idea that fulfills a specific user need by operating virtual assistants.

2. EMPATHY MODES: CRAFTING DIGITAL STRATEGIES

2.1 Gamification: Game Mechanics

There is a growing interest in the design industry in the creation of games as a way of fostering awareness to specific social and cultural issues instead of just having an entertainment purpose. This, according to Belman and Flanagan (2010), empathetic games challenge *players' social or political assumptions by allowing them to "see" events or topical issues from perspectives other than their own*. For this empathy mode, design students consider the dynamics of

play while thinking about the player's decision making process. An important factor in this empathy mode is that games are more effective when there are similarities between the players and the characters in the game. This in particular is exemplified in *Healthy Gobble*, a game designed for mobile devices by Maryam Alsuwaidi, and in *Pet Dash*, by Sarah Almatrooshi. Both projects were developed as the final exercise of the *Information Design* course that sought Graphic Design students to visualize and convey complex information while generating empathy through the use of technology. This was a joint exercise with the *Planning and Evaluation in Health Promotion and Health Education* course. This course is offered by the College of Natural and Health Sciences at Zayed University to students of the Public Health and Nutrition program. The Information Design students based their game concepts and prototypes on semester-long research shared by the Health Promotion students that sought to identify and understand common health problems in the UAE such as obesity, high blood pressure and diabetes.

The purpose of *Healthy Gobble* is for young children with diabetes or at risk of diabetes, to learn about the benefits of having wholesome meals and learning to identify and avoid junk food (**Fig. 3**). The game mechanic is simple; the player must “gobble” fruits and vegetables while skipping hamburgers and donuts falling from the sky. The healthier the food consumed; more points will be awarded to the player while food increases its falling pace (**Fig. 4**). The student also included in this game three play modifiers: one booster that allows the player to earn additional points, a time modifier that adds additional play time to the level, and a bonus points booster that duplicates the amount of points earned. Each booster is specifically related to a diabetes care task, such as measuring glucose levels, or having insulin shots (**Fig. 5**). The player also learns about the benefits of a healthy diet every time they complete a level unlocking new fruits or boosters.

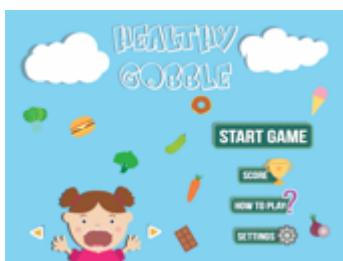


Figure 3. *Healthy Gobble*. Start Screen (Source: Maryam Alsuwaidi, Zayed University, 2016)

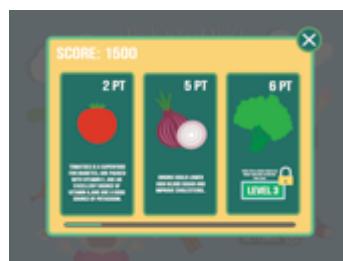


Figure 4. *Healthy Gobble*. Food description and point earning values.

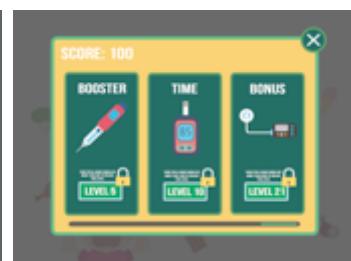


Figure 5. *Healthy Gobble*. Booster, time and bonus game modifiers.

Pet Dash is a game created to foster empathy to physical activity in children that combines a location-based gameplay and a digital pet. The pets are colorful and minimalistic creatures that mirror the physical activities carried out by the children when using their mobile phone or tablet. Upon starting the game, the user is asked to input their age, weight, height, and to give a name to their pet (**Fig. 6**). Based on this, a new profile is created and the pet starts to live in its own virtual world (**Fig. 7**). The game keeps records of the physical activity by relying on data generated by the device's accelerometer and pedometer. It presents achievements based on the activity level of the user and daily walking

distance recorded. The child's pet earns points based on its activity, which these points can be redeemed later for toys for the pet. This application presented the student the implications related to online privacy of children, their immersion with mobile devices, and the direct benefits and threats it brings to the underage users. It also generated a healthy discussion about the dependence of children on new technology and the importance of parents being involved in the monitoring of their children's online presence. As a design concept, Pet Dash can be further explored as a way of fostering physical activity using augmented reality in a similar manner to other successful mobile games such as Pokémon Go or Tamagotchi.

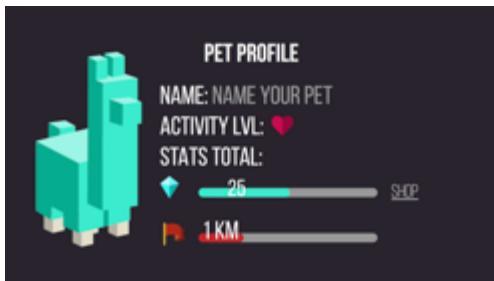


Figure 6. *Pet Dash*. Pet Profile.
(Source: Sarah Almatrooshi, Zayed University, 2016)

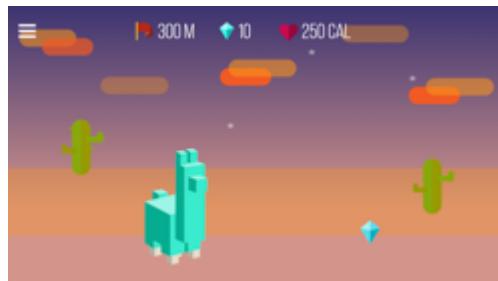


Figure 7. *Pet Dash*. Virtual World.

2.2 Monetization: Business Models

In this empathy mode, design students strategize about monetizing and generating revenue out of their ideas. This, not only reinforces their analytical abilities, but allows them to learn entrepreneurial skills. Gunes (2012) highlights the importance of including specific curriculum that prepares future designers with necessary managerial, economic and strategic thinking that allows a business to survive. This curricular addition could introduce basic concepts such as microeconomics, consumer culture, demand-supply, and pricing. According to Gunes, *entrepreneurship is an indispensable action or condition of design practice* (Gunes, 2012).

Lend A Hand is an application designed by senior student Afrah Shaheen, which seeks to facilitate the process of finding volunteering opportunities with NGOs in the UAE. This application was designed based on Afrah's own experience as she noticed the lack of a common platform to find and communicate with NGO's offering volunteer opportunities within the country. She conducted several interviews and discussions with other volunteers in order to understand their needs and of the different organizations (**Fig. 8**). She developed a business model similar to those used in search engines in which advertisers or organizations in this case, pay for the publication of the event (**Fig.9**). Organizations also had the possibility of paying extra for having featured or highlighted placement, priority placement in the search results, and the generation of customized notifications. Among other features of *Lend a Hand* was geolocation based results, and multiple ways of filtering data, including event date, location, and type of volunteering opportunity (**Fig. 10**). The revenue generated by the publication supports the cost of tech support and traffic of the platform, which allows this service to be free for the users and have a low cost for the organizations. This project also featured an NGO web

dashboard that allowed them to create and publish their ads, as well as manage specific information, such as geolocation targeting, administration of keywords, submission of push notifications, and picture sharing.



Figure 8. *Lend a Hand*.
(Source: Afrah Shaheen,
Zayed University, 2016)



Figure 9. Event detail
screen.

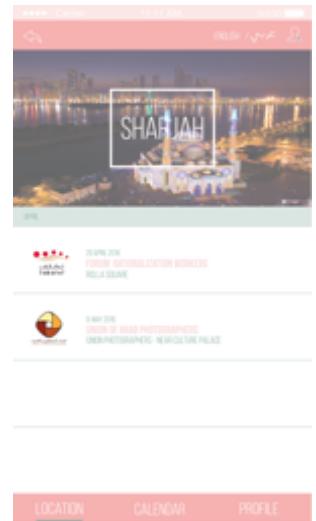


Figure 10. Search results
filtered by location.

2.3 Facilitation: Digital Companions

In this empathy mode, the students consider digital tools that facilitate daily life while understanding the context of the user and its needs. Thanks to empathy, designers, for example, are now able to recognize health issues by experiencing simulations of the symptoms and conditions of patients and users, while grasping a better view of possible solutions. Being able to recognize the users' needs and contexts, facilitates the creation of effective design solutions.

Institutions like GE Healthcare, the Cleveland Clinic and the National Institutes of Health, to name a few, are using empathetic tools to shape a holistic healthcare experience (Köppen, 2014, Cleveland Clinic, 2013, Carmel-Gilfilen, & Portillo, 2016). Among the benefits this holistic approach has brought to health care is the ability of a patient or a caregiver to monitor, record and track the evolution of a specific health condition using a mobile application.



Figure 8. Velcro in the
finger joints to limit fine
motor skills.



Figure 9. *W.R.A.P.* Apple Watch Application. Initial screen
(Source: Sarah Almatrooshi, Zayed University, 2016)



Graphic Design senior Sarah Almatrooshi created *W.R.A.P* (*Wrist Rheumatoid Arthritis Pal*) as part of her final project for Graphic Design IV, a studio course that presents the students with the necessary tools to apply empathy and design thinking to design projects. To understand this medical condition, the student developed a series of empathetic experiences that included the use of Velcro wrapped around the finger joins to limit the movement of the fingers (Fig. 8). Later, the participants were asked to do specific tasks that required fine motor skills such as writing text on a piece of paper, using the keyboard of a mobile phone, opening a medicine bottle and button or unbutton a shirt. She used the Business Model Canvas (BMC) and Value Proposition Canvas (VPC)² frameworks to identify the specific needs and struggles of the user. At the end of the research, she conducted a series of interviews and had discussions with patients to further understand the issue and identify the context of application of the idea. By creating *personas* with different Rheumatoid Arthritis stages, Sarah developed an application for a wearable device that allows the patients to log their activity, generate reminders related to the medical treatment, and define specific goals (Fig 9). The interface of this digital companion was designed considering the needs of the patient and its limitations with fine motor skills.

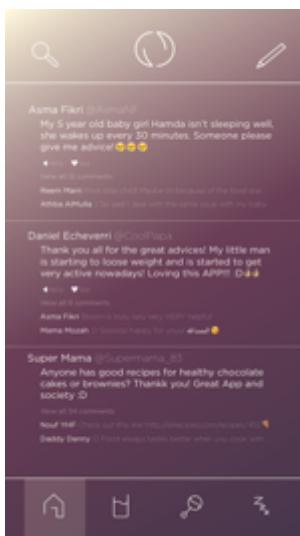


Figure 10. *Bloom*.
Mobile forum for parents.
(Source: Asma Fikri,
Zayed University, 2016)

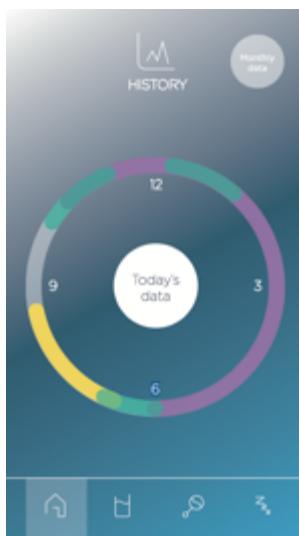


Figure 11. *Bloom*. Children information and progress tracking.

Bloom is another example of a digital companion, designed for parents whose child has weight problems. It was created by Asma Fikri as the final project of the Information Design course. This concept is based on the research presented by students from Health Promotion course and supported by a report that concluded that youth obesity in the UAE is two to three times greater than the international standard, having implications to public health policies in the country (Al-haddad et al, 2005). *Bloom* allowed

parents to form a digital community in which they could discuss their parenting and find a support group (Fig.10). It also included the virtual presence of health experts and pediatricians that could guide parents through their questions related to childhood obesity. This forum worked in a similar manner to other social media platforms in which the participants are able to “like”, share and

² Business Model Canvas (BMC) and Value Proposition Canvas (VPC) are frameworks designed for strategic management oriented towards the creation of business models. BMC is used to describe and design a business model while VPC seeks to understand the needs of a customer around products and services. Both frameworks can be downloaded from <https://strategyzer.com>

generate discussions towards specific health topics. This application also featured a set of tracking tools that included the evaluation of sleeping patterns and food intake (**Fig. 11**). It also offered a minimalistic interface that presented complex data as simple interactive visualizations and graphics to facilitate the understanding of the evolution of the child's condition.

3. DISCUSSION

The curricular expansion in design courses that include web design, video, animation, motion graphics, digital photography and multimedia courses has brought challenges to design programs as courses are “crammed” to teach all the skills a designer might need (Fleischmann, 2013). The packing of skills has a deep impact, because it prioritizes formal skills against other equally important skills, such as writing, theory, and history (McKnight, 2004). However, at the same time it presents an opportunity, as this type of hybrid multimedia designer can bring comprehensive solutions that are able to fit better in the needs of a market. These designers can generate unexpected results as they are more flexible about form and function than a traditionally educated designer. Empathy can act as the bridge between the digital and the human user. The digital realm relies on the creative ability to use and manipulate technology while the human one seeks to solve specific human-centered problems.

Empathy can allow the designer to widely understand the problem even when it is not design related; from health care, to business management to product marketing. This empathetic flexibility is innate to the design practice since, according to Richard Buchanan: *Design problems are ‘indeterminate’ and ‘wicked’ because design has no special subject matter of its own apart from what a designer conceives it to be* (Margolin, 1995). Empathetic design, an important component in Design Thinking, has been part of the latest expansion given to design curricula in the past years in schools and universities everywhere. In the specific case of empathetic design, this new skill is delivered to students as a component inside a course, in individual seminars or lectures, as part of a program unit or a combination of all of the above (Melles et al, 2012). Many schools mirror or base their Design Thinking courses on Stanford’s design thinking pioneer D.School Bootcamp Manual, as it offers a simple and accessible *empathize-define-ideate-prototype-test* framework.

The empathy modes presented in this paper have emerged from the experience of the author in the implementation of technology oriented projects for design students to acquire or improve their creative skills. Technology continues to drive change in design schools, as it becomes more complex. New design students; those who can be digital visitors or digital residents³, are able to grasp

³ According to White and Le Cornu (2011), *the Visitors and Residents continuum accounts for people behaving in different ways when using technology, depending on their motivation and context, without categorizing them according to age or background*. This is a response to the criticized notion formulated by Prensky of new students being Digital Natives (*Our students today are all “native speakers” of the digital language of computers, video games and the Internet*) (Prensky, 2001). For the sake of this paper, the author believes the visitor/resident view fits better to the concept of students as generators of digital strategies.

that complexity and generate sophisticated, yet compelling ideas. The projects presented here are a small sample of that. Crafting digital strategies require the collaboration between several disciplines; while designers transition into co-creators, those non-designers participants will be essential in the creative process (Echeverri, 2013). The use of any of these strategies in the classroom are oriented towards design projects that seek for the student to improve creative skills on a project-based learning environment. The unpredictability of these projects, in terms of having open-ended results from an initial problem allow the students to widely understand, discuss and engage it. These projects present a high level of complexity, for example, understanding arthritis, its symptoms and treatment, in order to develop a sense of ownership in the student and generate inquiries on their own (Helle et al, 2006). Major and Govers present a motivating conclusion regarding this: *projects are initiated and managed by the students, which is what distinguishes them from briefs or assignments. The students interact with the project tasks, in the sense that projects provide an opportunity for students to explore, experiment, and push boundaries* (Major & Govers, 2015). The creation of Digital Strategies based on empathy as a learning tool, aligns with efforts to establish STEAM (Science, Technology, Engineering, **Art** and Mathematics) based-education and Project-based Learning initiatives that support active and deeper learning.

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