Experience Designers and Their Roles as Researchers and Practitioners in the Academic and Commercial Fields

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Abstract

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1. Introduction

The employment of hacker/maker and design-based research practices in the academic research setting has afforded the design practitioner a means to participate in cutting-edge research, especially if the research outcome is product or service-oriented. Design research methodologies are sought out, but the acceptance of design-based research findings by the HCI community has only just come to maturity. Conferences such as ACM DIS[1] attest to this, as well as design tracks in various conferences such as ACM CHI[2] show that design research techniques and methodologies are making headways in the field. Still some believe that expectations from design research techniques should be curbed, yet also embraced for the novelty in approach it brings to problem-solving and interactivity development [1].

2. Regarding Insight in the Context of Design Research

There are several prevalent theories in regards to the phenomenon of insight as a product of problem solving. This includes the Dual Process [2]

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[1]http://dl.acm.org/event.cfm?id=RE212

[2]http://www.sigchi.org/

theory, the Three-process [3] theory, and the Four-stage [4] method.

Within the Dual Process theory, two systems are outlined when used to solve a problem. One system is that of logical and analytical process. This process is based on reason. The second system involves intuition and experience-based processes. According to Lin et. al, the second process is the more influential of the two, in regards to the system one uses to solve a problem.

The Three-process theory places emphasis on the intelligence, and the role it plays on problem solving. Specifically in regards to insight, three different processes are employed. This includes selective encoding (the process of focusing attention on ideas relevant to a solution, while ignoring features that are irrelevant), selective combination (the process of combining the information previously deemed relevant), and selective comparison (the use of past experience with problems and solutions that are applicable to the current problem and solution). According to Davidson and Sternberg, these three processes involve the application of intelligence.

Finally, Hadamar's Four-stage model offers four stages to problem solving. In the first stage, the individual prepares to solve a problem. Next, the individual uses trial-and-error, etc. to incubate on the problem. The third stage is where insight occurs, and the solution is illuminated. In the fourth and final stage, the individual employs selective comparison to refer to past experiences of problems and solutions to see if any are applicable to the current problem and solution.

The term *insight* is defined by the Oxford English Dictionary as the capacity to gain an accurate and deep understanding of someone or something [3]. In regards to insight within design research context, Barab and Squire state that *the goal of design-based research is to lay open and problematize the completed design and resultant implementation in a way that provides insight into the local dynamics* [5].

Yet design research can be used even before a completed design exists. Beyond the definition provided by Barab and Squire, design research also provides an opportunity during the development process to gleam insight in order to direct the course of designing a system or experience. Two design research consultants from the Chemistry [4] design consultancy speak about

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[3]http://oxforddictionaries.com/definition/english/insight

[4]http://chemistryteam.com/

insight from design research:

> Research is an essential part of our projects. Our focus is to augment the prevalence of hard quantitative data that our clients often already have with more empathic and behavioural insights. The latter allows our clients to see their customers as people rather than data sets. This is to understand and cluster them in terms of behavioural preferences and attitudes rather than demographics and numeric attributes. This approach allows us to bring a richer and more tangible perspective to our creative workshops, providing a fresh point of view for practically all our clients to date for them, in order to generate new and compelling solutions that would better meet their customers' needs. *Bassam Jabry, Creative Director at Chemistry.*

> The research phase is a crucial part of our design process. The methods we apply could be classified as ethnographic or qualitative in nature. Although at times it might be difficult to initially convey the importance and impact of ethnographic research to our clients, time and time again the quality of the insights gathered are able to convince them. Instead of targeting large numbers of people through surveys or focus groups, our research aims at a smaller number of participants, but in richer and more engaging formats. Next to face-to-face, in-depth interviews, that feel more like open conversations rather than strict data gatherings, we use observations, or shadowing of our participants to get a deeper understanding of their life. This form of research allows us to uncover insights around what motivates our users, their worries, aspirations and the thought processes behind their actions, or non-actions. By using different research tools in parallel we can uncover new aspects of their world. Working and engaging with them directly in the environment they live and work in helps us as designers, the tools to uncover pain points and opportunity areas in order to come up with improvements and innovative new solutions for the problems at hand. *Karin Aue, Senior Design Consultant at Chemistry.*

From the above quotations, it is apparent that the purpose of insight, at least within the context of design research, aims for intuition as an outcome.

The targets of such solutions developed from these insights seemed to not only be aimed at very specific clients, but also the users that these clients target, such as a market, user-base or community. The value of strict data collection comes secondary to understanding the behaviours, motivations and aspirations of these markets, user-bases and communities, and thus through transmutation, also the behaviours, motivations and aspirations of the organisations that serve them. These aspects are also increasingly important to academic research, specifically within the HCI field, as the research conducted in organisations such as MIT Media Lab and CUTE look to applications and prototyping to deliver solutions aimed at society. As such, there has been an increasing amount of design research techniques used in such research institutes. The value of this type of research method within the context of HCI has been discussed, most notably by Greenberg and Buxton [6]. A discussion of this is expanded in the following section.

3. On Usability Evaluation

Saul Greenberg and Bill Buxton presented a paper at ACM CHI 2008 regarding the possibly harmful effects of usability evaluation [6]. They argue that although useful, when employed *by rule* as opposed to *by thought*, usability testing can, among other things, stifle innovation, mute creative ideas and quash inspired vision. They identify that any type of evaluation methodology should be used appropriately, with consideration to an actual problem or research question and go so far as to suggest that evaluation is often not even needed for some of the works produced within the CHI community.

This is not to say that user evaluation is completely useless. On the contrary, Dix et al. describes evaluation as a good way to *asses our designs and test our systems to ensure that they actually behave as we expect and meet the requirements of the user* [7]. The issue that arises is the appropriateness for evaluation in regards to the context of the research.

Commonly practiced usability evaluation methods are numerous. Some of the more popular techniques include user observation in laboratory settings, controlled user studies, and various inspection techniques [7] [8] [9]. The purpose of employing such techniques are varied depending on context. Identifying usability bugs is often the goal of practitioners evaluating products and services. It is often the job of developers to take into consideration these bugs and develop fixes appropriately. This is often cited as part of iterative development [10].

Acceptance testing also relies heavily on usability evaluation. This often entails qualitatively measuring a user's successful performance according to various criteria, including measurable parameters such as satisfaction, error rate and time to complete task. In terms of deciding on purchasing one product versus another, usability testing can determine which product is better at certain functions compared to another.

Specifically in the field of HCI research from a scholastic perspective, usability is often employed to evaluate novel design concepts, often in the prototype stage of development, in order to validate design choices in terms of human performance. Most often in comparison to other prototypical systems, researchers hope to show that their users achieve a stated goal (e.g. task completion, performance measures) to display that their tasks and processes are improved when using the prescribed system or method.

Clearly displayed in far too numerous studies of implementation within HCI, researchers use usability to validate their work. Greenberg and Buxton ultimately call for the HCI community to embrace and be open to other, non-empirical methods [6]. Yet in order to understand the role of non-empirical methods employed by researchers and practitioners within the design context, an understanding of the roles that designers play in the commercial and academic fields is needed. With this aim in mind, a survey was conducted to better understand the perception of design, with focus on the multidisciplinary area of Experience Design. The findings from this survey is presented in the following section.

4. Survey to Understand the Similarities and Differences Between Design Researchers and Design Practitioners

A survey was conducted with the purpose of understanding the similarities and differences, if any, between design researchers and design practitioners within the context of *Experience Design*. This survey was designed using [11] as a guide. Expert participants were sourced from the design practice and scholastic research fields, working primarily in academic research institutes, as well as practicing professional from the freelance, private and commercial communities. The results and summary of this data can be found in an Appendix later in this dissertation. Raw data collected from the survey
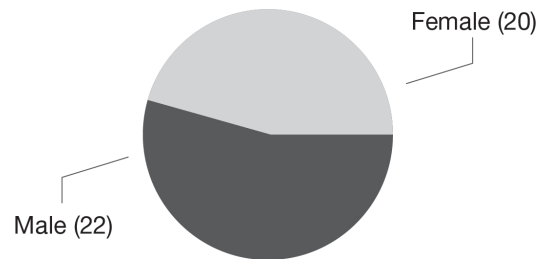
Figure 1: Of the 42 people that completed the survey, 22 participants were male, while 20 were female (mean average of 32.59, standard deviation of 7.39, with one participant who did not provide their age.

can be found at the following link [5], footnoted below.

As seen in Figure 1, of the 42 people that completed the survey, 22 participants were male, while 20 were female (mean average of 32.59, standard deviation of 7.39, with one participant who did not provide their age).

Questions consisted of a combination of Yes/No queries, open-ended questions as well as Likert scale questions. This combination of question styles provided a means for the collection of qualitative and quantitative data. A sample of the survey can be found in a following Appendix chapter. The survey was conducted online using Google Drive [6] and was distributed by direct email to potential participants chosen for their background and profession, as well as publicised on professional user groups in social networks such as Facebook [7] and Mendeley [8].

From analysis of the survey, several insights can be derived. This includes an understanding of a definition for the term *Experience Design*, opinions on who are experience designers, the differences between academic and commercial work environments, challenges of working in multidisciplinary teams, if there are any differences and similarities between design practitioners and design researchers, as well as a examples of workflows from practitioners and researchers along with the general skills involved in executing them.

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[5]https://docs.google.com/spreadsheet/ccc?key=0AhY0aUil40MedDFMVDd0R3IyeUtCWlBv TGtLM1BCMkE&usp=sharing

[6]https://drive.google.com

[7]https://facebook.com

[8]https://mendeley.com

4.1. Defining Experience Design

For this research, the following definition from [12] was used as a contingent definition. Aarts, and Stefano define *Experience Design* as the practice of designing products, processes, services, events, and environments with a focus placed on the quality of the user experience and culturally relevant solutions. This definition bares similarity from the idea that participants in the survey have regarding the definition of experience design. Some of these include:

- Designing products or services to improve the quality of human experiences or to augment human experiences. *Male, 30, PhD Student at the National University of Singapore.*

- Facilitate conversation between user and product. *Male, 28, Assistant Professor at City University Hong Kong.*

- Experience design is the process of designing for the senses pertaining to factors such as social environment, user-interactivity, etc. *Female, 30, Senior Designer at M.inc.*

- Creating a space or environment which allows the occupants to feel and experience in a particular situation. *Female, 35, Architect formally working at OMA, Atelier Bow Wow, now Lecturer at University of Adelaide.*

- Typically it is the design of total, multi-modal experiences. I can say that I do that with other practitioners from other disciplines (e.g. fine art, film). *Male, 64, Composer and Sound Artist.*

- I would say the definition of experience designer: Designer who focuses on the interactions between the user(s) of tools, products or services. *Female, 26, Interaction Designer formally at IDEO.*

- Purposefully curating the experience that a person/visitor/customer/end user will have at an event or using goods or services, to add value and make the activity more memorable. *Female, 30, British Music Experience Education Manager and Experience Design tutor for Artscom at Central St Martins.*

- A cross disciplinary, multi-sensorial design approach taking the overall journey of the user into account and mapping it across all relevant touch-points to create one holistic experience. These experiences can have various formats in terms of size, time span or medium e.g. combining space, communication and UI design to create a exhibition or retail space. *Female, 32, Senior Designer at a design consultancy based in Singapore, formally Creative Director of Arthesia, Exhibition Designer for OMA, Senior Designer at IDEO and Designer at KesselsKramer.*

- Designing products or services that creates emotional responses. Sometimes I think it is satisfying user needs with a product or services. *Male, 30, Lead UX Designer at Honeywell Technology Solutions Lab.*

- Bringing forth a context that encourages a set of desired experiences. Designing such that the user might later hold a memory or narrative account that shares in some ways the vision the designer held in shaping an object, event, or process. *Male, 38, Assistant Professor at Aarhus School of Architecture.*

- Define users' expectation, translate them it to features or processes, select the important ones and arrange them in such a way that won't give ambiguity to users. *Male, 23, Electrical Engineer at T.Ware.*

- A well crafted process/space where everything from the biggest to the smallest has been considered (and designed). It's about preempting and anticipating people's reactions, feelings and responses to their surroundings and ensuring that there is no void or glitch in the process where the user/person is unhappy or annoyed. Seamless, smooth, functional and sometimes wows. It's also about conveying a message (e.g. a brand) at every single touchpoint, again not leaving anything to chance, in order to ensure the bigger message and desired atmosphere is conveyed. *Female, 33, Senior Designer at Chemistry Pte. Ltd.*

- Design something for the end user taking into consideration all the touch points and designing it for being a whole and consistent experience that would be memorable. *Female, 31, Senior Design Researcher at Asus.*

- Experience design is about delivering a cohesive set of interactions from an end user point of view across a particular 'journey'. The experience

should ideally address all facets of the mind and all senses as and when appropriate. It should work to resolve the end users's known needs and challenges and in addition bring an element of new and unexpected experience that will create an enduring memory of that experience. *Male, 39, Formally Design Account Manager and Senior Design Consultant at Philips Design, currently Creative Director at Chemistry Pte Ltd.*

As seen in Figure 2, a weighted list was generated using all survey responses pertaining to the question *What is your definition of experience design?* at Wordle [9]. Major terms that were shared across many of the definitions include interaction, environment, people, products, process, service and user take precedence when defining Experience Design.

When comparing the various definitions it is apparent that experience design requires a multidisciplinary collection of skills and practitioners. This is confirmed by the variety and amount of practitioners that all agreed to significant degree (100% of the 41 participants answered positive when asked *Can you consider the work you engage with to be the designing of experiences?*) that their work involves the designing of experiences.

4.2. Who are Experience Designers?

In regards to education, 23 of the respondents achieved the Master degree level (55%) while the remaining participants were closely divided between achieving a Bachelor degree or Doctorate degree. 9 participants had Doctoral degrees (21% of the participants) and 10 had Bachelor degrees (24% of participants). This is represented in Figure 3. The majority amount of graduate-level degree holders indicates that most participants were familiar, at least on a rudimentary level, with a basic conceptual understanding of research, which *comprise(s) (of) creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications.* [13].

From choosing a selection of expertise types, 48% of participants (20 responses) considered themselves from the Design field, 36% from the Science and Technology field (15 responses), 10% from the Fine Arts (4 responses), 5% from the Social Sciences (2 responses), 2% from the Humanities (1 response), and 0% from Business (0 responses), with zero respondents choosing
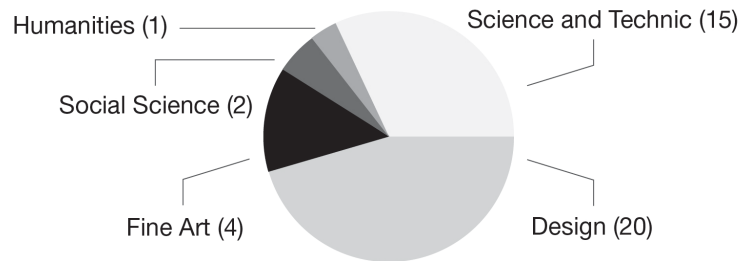
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[9]http://www.wordle.net/

Figure 2: A weighted list containing the major keywords from the responses to the question "What is your definition of experience design?" shows that the terms interaction, environment, people, products, process, service and user take precedence when defining Experience Design.

Figure 3: Total result of responses when asked *What is your level of education?*

Figure 4: Total result of responses when asked *What is your area of expertise?*

from the item field *None of the Above*. This is represented in Figure 4. Of the expertise types offered in the survey, the majority of respondents were either from a design or a science and technology background. This hints at the further need to develop parlance, methods and tools that are usable by researchers and practitioners from these two backgrounds. It is also worth noting that these two areas of expertise are converging, partly due to the need for both aesthetic and software development skills required of contemporary UX designers, and HCI computer scientists and engineers, in a world that is increasingly migrating to online and mobile services with the user at the centre of the equation [10].

When asked whether they think themselves to be designers, researchers and/or practitioners, 30 out of 42 respondents indicated that they considered themselves designers (71%), 30 out of 42 respondents indicated that they considered themselves researchers (71%), and 41 out of 42 respondents indicated that they considered themselves practitioners (98%). These responses are represented in Figure 5, Figure 6, and Figure 7 respectively. A designer was defined as an agent that specifies the structural properties of a design object. In practice, anyone who creates tangible or intangible objects, such as consumer products, processes, laws, games and graphics, is referred to as a designer [14]. A researcher was defined as somebody who performs research, independently as a principal investigator, the search for knowledge or in general any systematic investigation to establish facts. Researchers can

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[10]Why The Valley Wants Designers That Can Code. http://www.uie.com/brainsparks/2011/05/31/why-the-valley-wants-designers-that-can-code/
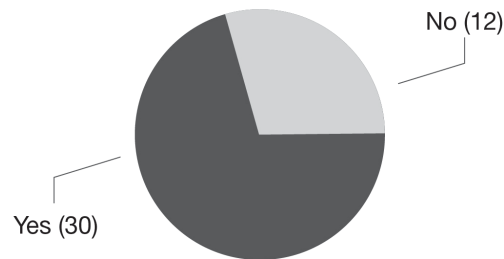
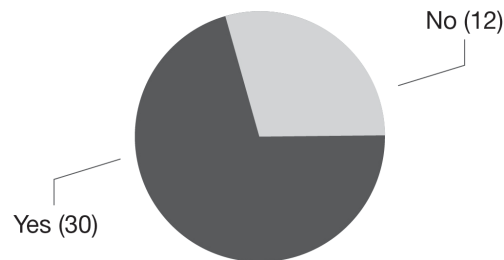Figure 5: Total result of responses when asked *Do you consider yourself a designer?*

Figure 6: Total result of responses when asked *Do you consider yourself a researcher?*

work in academic, industrial, government, or private institutions [11]. A practitioner was defined as a person who regularly does an activity that requires skill or practice [12].

When asked *Can you consider the work you engage with to be the designing of experiences?* (Table 8), all 42 respondents (100%) indicated that their work engages with the designing of experiences, yet only 28 of the 42 respondents (67%) indicated that they considered themselves to be an experience designer when asked *Do you consider yourself to be an experience designer?* (Table 9). This disparity may be attributed in part to the unestablished definition for the term *Experience Designer*. Also as with many multidisciplinary practitioners, the use of well-established titles that are defined by their profession could also contribute to the resistance in calling oneself an *Experience Designer*. Regardless of these consideration, the fact that 100% of all participants considered at least part of the work that they do experi-

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[11]http://en.wikipedia.org/wiki/Researcher
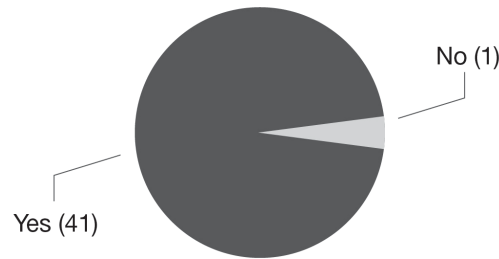[12]http://www.merriam-webster.com/dictionary/practitioner

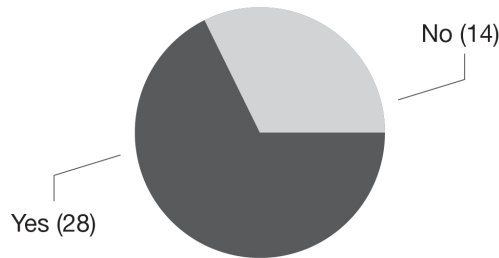Figure 7: Total result of responses when asked *Do you consider yourself a practitioner?*

Figure 8: Total result of responses when asked *Do you consider yourself to be an experience designer?*

ence designing, it can be assumed that the practice of experience design is multidisciplinary and is practiced by many practitioners across the fields of design, and science and technology.

4.3. Challenges of Working in Multidisciplinary Teams

Taking the results presented in the above subsection into consideration, it is explicit that experience designing requires a multidisciplinary approach. To further understand why a portable and generalised toolkit for experience designers is needed, an analysis of the challenges of working in multidisciplinary teams should be considered. In regards to the disparity of multidisciplinary learning between the workplace versus classroom, Wojahn et. al considered the challenges in regards to communicating discipline-specific concepts in a technical curriculum, and how it is inadequate considering that companies and workplace teams are increasingly becoming more and more multidisciplinary [15] when compared to the siloed and compartmentalized state of undergraduate studies. Furthermore, previous work in this area has
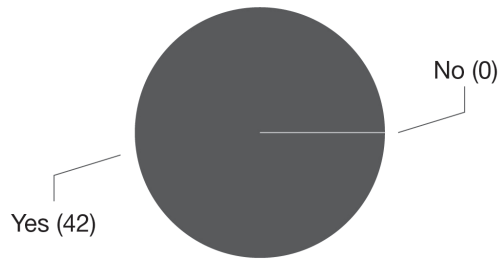
Figure 9: 100% of survey participants consider the work that they do involves Experience Design, when asked the question *Can you consider the work you engage with to be the designing of experiences?*

been considered in the field of psychology [16][17]. Specifically in regards to experience design practice, no work has been done to understand these challenges. Using the data collected in the outlined survey, respondents shared their perspective when considering these challenges. The following are some of the direct quotes collected from the survey.

- Implement designing ideas to workable prototypes using technology. *Male, 30, PhD Candidate in CUTE.*

- Maintain the balance between the ultimate design and technical feasibility of the implementation. *Male, 30, Researcher at the National University of Singapore.*

- Communicate the feasibility of ideas to designers. To understand the real need of users. Users lie to you some times. *Male, 28, Assistant Professor at City University Hong Kong.*

- Communication is usually the biggest challenge, designers and developers often speak different languages, so I think it's beneficial to work across the spectrum of both roles as much as you can. *Female, 28, Previously Teaching Assistant at Keio University.*

- It is difficult to find the right resources and right person to solve the problem. The communication between different areas is not always going well. *Female, 26, Research Assistant for UX at CUTE.*

- Different priorities, different values, different languages. *Female, 35, Architect formally working at OMA, Atelier Bow Wow, now Lecturer at University of Adelaide.*

- Syncing between the teams. Finding a common language and understanding. *CEO at T.Ware.*

- Other people not being used to working across disciplines, and not being able to understand that someone might have skills outside their official job title. *Female, 30, British Music Experience Education Manager and Experience Design tutor for Artscom at Central St Martins.*

- Speaking the same language. Filling the gaps; transcending and coordinating between disciplines. Creative direction; making sure the overall experience is more than the sum of its parts. *Female, 32, Senior Designer at a design consultancy based in Singapore, formally Creative Director of Arthesia, Exhibition Designer for OMA, Senior Designer at IDEO and Designer at KesselsKramer.*

- Common language; evaluate may mean something different to a sculptor than to an HCI person. *Male, 50, Casual lecturer at university, Contract programmer and designer, PhD student, Musician, Consultant, Geek-in-Residence.*

- Passions and desired audiences are often different. *Male, 38, Assistant Professor at Aarhus School of Architecture.*

- Spending time trying to understand each other, differences in terminology, in goals, in ways of thinking. *Male, 36, University professor, teaching about HCI and supervising master's and phd research projects in information visualization.*

- Making sure that everyone is always on the same page. Having a rigid execution process, very little scope for flexibility as any deviation from the defined process affects the work of multiple members. Identifying if the approach others are following is the most optimum for the proposed solution. given the little understanding of other's domain, you always ponder if there is a better way to do their work. *Male, 22, Currently a PhD Student at NYU, previously an Analyst, Deloitte Consulting LLP.*

Figure 10: Total result of responses when asked *Do you work in a multidisciplinary team?*

- Sincerely no challenges. I think a multidisciplinary team enriches the team and helps to create better results. Having different points of view and bringing into the table different experiences of the team members are all for good. *Female, 31, Senior Design Researcher at Asus.*

- Managing different points of view. Co-ordinating different outputs into one cohesive whole. Dealing with the breadth and complexity of taking on projects that require such a multidisciplinary output. *Male, 39, Formally Design Account Manager and Senior Design Consultant at Philips Design, currently Creative Director at Chemistry Pte Ltd.*

As represented in Figure 10, 37 of the 42 survey participants answered positively when asked *Do you work in a multidisciplinary team?* A weighted list (Figure 11) was generated using all survey responses pertaining to the question *What challenges do you face working in multidisciplinary teams?* at Wordle. Major terms that were shared across many of the challenges include communication, language, process and understanding, when outlining the challenges multidisciplinary teams face.

4.4. Design Practitioner versus Design Researcher. Is there a difference?

As stated in the above subsection, and for the purpose of this study, a Practitioner is defined as *a person who regularly does an activity that requires skill or practice*, while a Researcher is defined as *somebody who performs research, independently as a principal investigator, the search for knowledge or in general any systematic investigation to establish facts*. These two definitions however are not mutually exclusive as there is overlap. A researcher is in many ways also a practitioner, as the practice of specific skills are needed to conduct research. Likewise a practitioner in essence bases their practice

Figure 11: A weighted list containing the major keywords from the responses to the question "What challenges do you face working in multidisciplinary teams?" shows that the terms communication, language, process and understanding take precedence when understanding the challenges when faced with multidisciplinary teams.
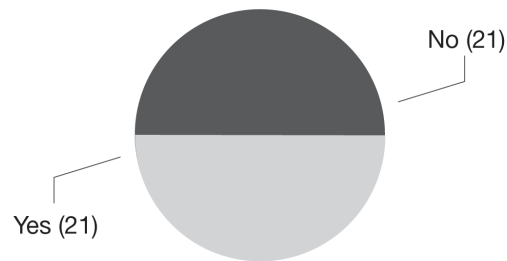
Figure 12: Total result of responses when asked *Do you consider the work you do academic work?*
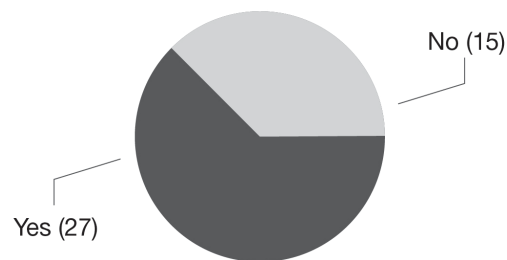

Figure 13: Total result of responses when asked *Do you consider the work you do commercial work?*

on the theory and research one's practice is based on. This is evident when analysing the responses provided by participants in the survey presented.

When asked if participants considered the work they do as academic work, exactly 50% (21 out of 42) of participants answered *Yes* (Figure 12). When asked if they considered their work as commercial work (Figure 13), 27 out of 42 participants (64%) indicated that the work they do as commercial work. When asked if they considered conducting research a fundamental part of their practice (Figure 14), 39 of 42 participants (93%) considered research as fundamental to their practice. This significant number indicates that research is essential to both academic and commercial practices.

Specifically in regards to design research versus design practice, 41 out of 42 participants (98%) indicated that design research is a useful component in the commercial design environment, as shown in Figure 15. Likewise a significant amount of respondents (39 our of 42, or 95%) considered design practice a useful component in the academic research setting, as depicted in Figure 16. Although an interesting if not predictable outcome, this question
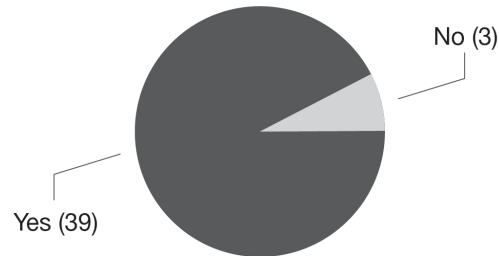
Figure 14: Total result of responses when asked *Do you consider conducting research a fundamental part of your practice?*
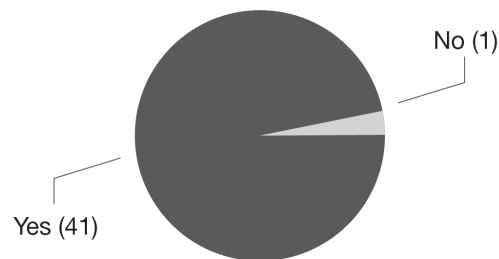

Figure 15: Total result of responses when asked *Do you think design research is useful in a commercial setting?*
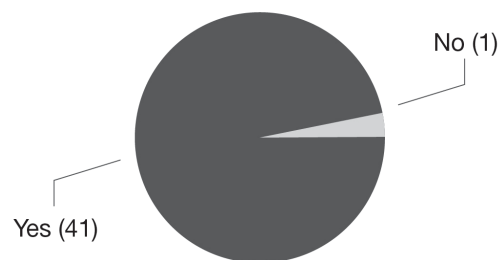

Figure 16: Total result of responses when asked *Do you think design practice is useful in an academic research setting?*

can be considered faulty, as most likely the answer to both questions (*Do you think design research is useful in a commercial setting?* and *Do you think design practice is useful in an academic research setting?*) may have been posed incorrectly as to coerce participants to answer positively. Yet if any insight can be extrapolated from the above results, it can be further understood that multidisciplinary teams consisting of both design practitioners and design researchers are important to both the academic and commercial environments. This is evident when looking at the results of asking participants if they worked in multidisciplinary teams, to which respondents answered *Yes* to a significant amount (37 out of 42, or 88%). Furthermore the results seem to indicate that Design Practice and Design Research come hand-in-hand, and are essential to the overall concept of design. This is further evident with the popularity of academic discourse [18] in regards to design concepts such as design thinking [19] and its derivatives [20] in the research setting [21].

4.5. Outlining the Differences Between Working as a Designer in an Academic Setting Versus a Commercial Setting

If it can be assumed that design researchers and design practitioners are one and the same, or at least that designers employ both traditional design tool crafts as well as research methods. Outlining the differences in working environments becomes the next question. In order to understand this better, participants of the survey were posed with the following questions: *What do you consider to be the differences between design research in an academic setting versus a commercial setting?* and *What do you consider to be the differences between design practice in an academic setting versus a commercial setting?*. The following are some of the responses from these two questions.

4.5.1. What do you consider to be the differences between design research in an academic setting versus a commercial setting?

- The biggest differences I think is for a commercialised product the most important issue is marketing, and possibility to make profit. Designers needs to consider it most, and sometimes it limits the creativity. *Male, 28, Assistant Professor at City University Hong Kong.*

- I would say research in academic settings has more chance for more open/radical ideas. I feel this is due to the less strict requirements

for KPIs (key performance indicators) such as academic papers, etc. and the ability to secure more grants for more open ended grants. i.e. failure in a design research product could be another results where in a commercial setting, it could be a huge set-back for the commercial entity. This does not mean that commercial entities do not come up with new radical ideas. I would say that these entities are focused more on designing for products that are generally required to be successful. This may need these entities to focus on proper guidelines and methodologies where as the academic community has more flexibility in this regard to "explore" potential areas. *Male, 31, Research Fellow at Singapore University of Technology and Design*

- Academic setting I think is more open to experiment with new areas than commercial setting which is more focus in branding. Also most of time commercial settings are defined as event or campaign base rather than long term research or study. *Male, 30, Research Associate at CUTE.*

- Academic: With more time, design research is more extensive, with a wider spectrum of studies and more possibilities of connecting disciplines during the design processes, with no direct application to everyday design practice. Commercial: Less detailed study on the subject/product, focus is more on the end user requirements. *Female, 30, Senior Designer at M.inc.*

- The two should be connected. It should not be so different. Both should feed back into one another. *Female, 35, Architect formally working at OMA, Atelier Bow Wow, now Lecturer at University of Adelaide.*

- My opinion is that research in a commercial setting is very important in how you deliver the insights, and how designers (of all field) can make use of it. After all it's all about implementation of ideas, so if the scenario is not making sense or is not reasonable/feasible, less the value of research outcome can bring about bridging is the key. While in academic setting, it's all about exploring and making it profound. Scenarios created might not be reasonable or realistic, sometimes very blue-sky, which are fine, because the main thing is about the ideas. *Female, 29, User Experience Designer at Asus.*

- The aims and objectives. Straight academic research is typically more 'blue sky'. *Male, 64, Composer and Sound Artist.*

- The time framework are different, in a commercial setting the outcomes are expected sooner. In a commercial setting the "mistakes" or unexpected outcomes are less welcomed even when they bring more interesting data. The commercial is looking sometimes for specific outcomes, while the academic can be more experimental. *Female, 36, Founder of Xuna in partnership with Interexpo Co. Ltd.*

- Time line is much shorter for commercial setting. Need to be much more focused on delivering value that can be monetized. *CEO at T.Ware.*

- I'm not sure that there is one, however I have come across a difference between the ways research is used in a commercial vs. audience focused setting.

  A large music venue that I happen to know has a data management system which they use to handle the emails they receive to their customer services team. This system is set up to enable them to process the emails they receive more quickly, and to monitor the flow of information so they can see which staff member has dealt with the most complaints the quickest.

  It is not however capable on reporting on the type of contact they get (complaints, feedback, issues, lost property, etc.) or the general levels of customer satisfaction - a conversation is flagged as resolved when the customer stops replying.

  The data generated is used to design a better system from the point of view of the company - not the customer. They use the data to design a 'better' system for answering emails, not a better system for dealing with - and ultimately eliminating - customer issues. *Female, 30, British Music Experience Education Manager and Experience Design tutor for Artscom at Central St Martins.*

- Speed... time constraints in a commercial setting and a fixed production date means less time to explore, research. The need for a very defined research focus. *Female, 26, Designer at T.Ware.*

- In an academic setting, design research focuses on gathering data and finding patterns in it where as in a commercial setting it focuses more on gathering insights through observations. *Male, 30, Lead UX Designer at Honeywell Technology Solutions Lab.*

- Academic outcomes are for dissemination and platforms of communication, commercial design research is focused on developing a brand or business. *Male, 38, Assistant Professor at Aarhus School of Architecture.*

- Design research in an academic setting will start from a question or idea set by an individual, while commercial settings normally come from solving problems or requests from client and stakeholders. *Female, 31, Formally Multimedia Designer at mig33 Pte Ltd and Web Designer at Converse Singapore.*

- Academic: less of a need to be practical, can be longer term / more forward looking and less constrained. *Male, 36, University professor, teaching about HCI and supervising master's and phd research projects in information visualization.*

- In commercial setting, the end result is more refined, less buggy and easily replicable. In academic setting, the novelty of a design is given priority. However, in commercial setting, the feasibility of a design (and if it can be pushed to market) and ease to use of the final outcome are focused upon. *Male, 22, Currently a PhD Student at NYU, previously an Analyst, Deloitte Consulting LLP.*

- Academic settings look for novelty while commercial setting looks for commercial success. That's the main difference. *Male, Unknown Age, Assistant Professor in HCI at the National University of Singapore.*

From analysing the results a number of insights can be obtained. First, a majority of survey participants believe that the outcome focus for design research in an academic versus commercial setting is that of novelty versus commercial viability. Design research conducted in the academic setting looks to develop novel research outcomes that may not be feasible or even usable by everyday users. Commercial applications of design research look to improving the final product or user experience, in relation to the profitability of said product or user experience, however. Another interesting outcome

of the survey question includes the the constraint of time. Several of the respondents thought that design research in the academic setting was not hindered by constraints such as market cycles. This wider allocation of time for academic design researchers allowed them more freedom for exploratory research. On the other hand, design researchers working in the commercial space were focused on very strict deadlines in alignment with the brief set out by the client. Where some respondents did agree was that design research in both the academic and commercial environments is conducted to obtain insight instead of hard data.

4.5.2. What do you consider to be the differences between design practice in an academic setting versus a commercial setting?

- I think time is a big factor between working in academia versus commercial, so far. Another is probably your audience. In academia, you communicate to other academics or specialists of the given field. In the commercial setting of the daily iPad-based newspaper, you are (speaking to a) very general public (even more so than versus a news website, where there is somewhat more fluidity in terms of traffic). *Male, 33, Digital Journalist and Developer, La Presse Newspaper.*

- Academic design practice had endless possibilities. It varies and is more flexible, depending on the research and methodology used for design processes. Commercial design practice solely depends on what the clients need, with external considerations such as budget, guidelines, time, etc. *Female, 30, Senior Designer at M.inc.*

- Design practice in commercial setting has more aspects to consider. Take industrial design as an example, things like colour and materials choose, competitors, cost related issue are there to give you headache, also there are things to do with marketing, customer acceptance etc. In an academic setting, excuse me if I don't know much, design practice is more like a prototype - as long as it works. Of course it still can be great, but somehow it's not going to be sold in the shop, there are relative fewer issues to consider. I don't doubt that design is not necessary in academic setting, especially when it comes to testing or publish/promote the ideas, good design solution is likely to make the idea more convincing. *Female, 29, User Experience Designer at Asus.*

- I think in a academic setting design is used to test assumptions and the

final design can be a tool to get to know something, the tool cannot be used to be sold or used in real situations for example. I think in a commercial setting, the product should be finished and to be monetized. *Female, 26, Freelance Interaction Designer, formally Interaction Designer at IDEO.*

- The outcome or aim is different. While both would be to improve the products/services/experiences on offer, an academic setting would be focused on enriching the experience for the user, while the commercial setting's main aim would be to create more value for the business itself. *Female, 30, British Music Experience Education Manager and Experience Design tutor for Artscom at Central St Martins.*

- It all depends on what are you creating and to what level? Design practice could be the same in both settings. Academics build prototypes to prove their findings/inventions where as in a commercial setting, products are built which can be used in daily life. *Male, 30, Lead UX Designer at Honeywell Technology Solutions Lab.*

- There's very little difference if the research question is relevant. Controlling for variables is probably the biggest difference. *Female, 47, Freelance Web Usability Specialist and Technical Writer, formally Assistant Professor of Business & Technical Communication at West Chester University of PA, Associate, Professor of Technical Communication at the University of North Texas, Visiting Instructor of Communication at Western Kentucky University.*

- Academic setting: the people still following order and formally discipline. Commercial setting: people usually work in a more disorderly way and tend to forget some steps in the investigation. *Female, 26, Master Student at the Catholic University of Valencia.*

- Design practice in an academic is setting more like Activism for ethical purpose, making an effort to enhance society. A commercial setting has the aim to activate economics to enrich the target society. *Male, 35, PhD Candidate at Central Saint Martins.*

- The academic setting allows for radical experimentation while the commercial one might not, even though sometimes it does. There is less

money and more politics in academy then in commercial practice. commercial settings can be more canonical, less exposed to alternative thinking then academic ones. *Female, 33, Co-director of 72 Hour Urban Action and Independent Curator.*

Reading the responses reveals that the differences between working as a designer in an academic setting versus a commercial setting focus on overall aim (creating social versus economic value), outcome (investigating a theory through prototyping versus developing a product for mass use), time (longterm exploration opposed to time constraints due to client needs), and flexibility (failure in an academic setting is useful and acceptable whereas in a commercial setting it could mean the loss of revenue). However there were some similarities which included the focus on the user to inform the design process and direct research, as well as the actual method of practice, as many believed that the same tools and methods were employed, although to differing ends.

There were a couple issues with the above two questions. From analysis of the responses, it seemed that the two questions posed (*What do you consider to be the differences between design research in an academic setting versus a commercial setting?* and *What do you consider to be the differences between design practice in an academic setting versus a commercial setting?*) were too similar for some participants to differentiate. This may be due to the idea that design practice and design research is used by all designers, regardless of work setting. However this confusion may further indicate that designers are both practitioners and researchers, as the act of designing in both an academic and commercial setting employ similar methods. Some of these tools and their uses expressed by participants are offered in the following subsection.

4.6. What Tools are Employed and How are they Used?

To further understand the similarities of design practitioners and design researchers, the survey posed two questions in order to understand the tools and methods that are employed by designers, as well as understand how they use them. The questions that appeared on the survey to explore this were *What methods and tools do you use for your work?* and *Which order do you use each tool or method? Please tell us how one method or tool informs the next.*

Figure 17: A weighted list containing the major keywords from the responses to the question "What methods and tools do you use for your work?" shows that the terms communication, language, process and understanding take precedence when understanding the challenges when faced with multidisciplinary teams.

4.6.1. What methods and tools do you use for your work?

A weighted list was generated using all survey responses pertaining to the question *What methods and tools do you use for your work?* at Wordle, as illustrated in Figure 17. Major terms for the methods and tools employed include brainstorming, ethnography, interviews, mapping, prototyping and sketching. Others that were widely used include participatory, sketching, usability, tinkering, hacking, iterative, shadowing, iterative, and journey.

This question posed may have been far too open ended, as the terms offered by participants seem general and non-specific in regards to concrete methods and tools. Nevertheless it can been seen that similar concepts for the general tools used by all participants regardless of practice or background

were shared to a high degree. Further evidence for this can be found in a following Appendix chapter, in the form of the raw data responses. This also further supports the view that design-centric tools are increasingly becoming employed by practitioners and researchers from areas other then design. These general tool and method terms might have been used as responses due to the multidisciplinary nature of the teams some participants operate in. If this is indeed the case, then a general vernacular that is easily understood amongst differing practitioners and researchers is required, therefore the generality of the above terms offered could be such a vernacular for all members of a multidisciplinary team to communicate and work with one another.

4.6.2. Which order do you use each tool or method? Please tell us how one method or tool informs the next.

The goal of this question was to understand if a common workflow process could be prescribed to designers working in both the academic and commercial fields. This informed the development and purpose of the toolkit proposed in this dissertation. The usage of methods and tools employed in the work process cycle of participants varied to a minimal degree. Overall, similar tools were used at similar stages of a process with little deviation. A sample of some of the responses to the question are as follows.

Female, 28, Currently Unemployed, previously Digital Designer.

1. Research into technologies, competitors and design requirements, discussion with client on their purpose and previous experiences
2. Gathering tech tools and registrations (domains, hosting, etc.)
3. Paper design, wireframes, consult with client (navigation, content)
4. Build and customise (wordpress, html, css, templates, fonts, colours)
5. In-house testing
6. Customer feedback, redesign or signoff
7. Go live
8. Handover or continue management
9. Continuing content and community engagement

Male, 31, Research Fellow at Singapore University of Technology and Design

1. Idea generation (could be from any thing : improving existing, notice differences, brainstorming, etc)

2. Research for existing technologies (try to identify technologies/processes related to the idea, this could lead into identifying ways to implement, and also identify which features could be added or removed, or simply stop if a closely similar product/tech exists)
3. Prototype (make an initial version of the product that is presentable to a user)
4. Present to users for evaluations (get the users' feedback, ideas, potential new application areas, evaluate for usability or other metrics)
5. Based on feedback tinker/hack or create new prototype
6. Iterate this process

Female, 26, Research Assistant at CUTE

1. Ethnographic study, field work
2. Focus group
3. Experiment design
4. Statistical analyzation
5. User-centered design

Female, 32, PhD Scholar at CUTE

1. Survey (previous works) to find the gaps and problems
2. Participatory design to empathise with user and figure out the form factors
3. Tinkering and iterative prototyping to facilitate brainstorming and then again go back to design

Female, 32, Senior Designer at a design consultancy based in Singapore, formally Creative Director of Arthesia, Exhibition Designer for OMA, Senior Designer at IDEO and Designer at KesselsKramer.

1. Discover - research
2. Define - looking for patterns and insights, coming up with opportunities to improve and innovate
3. Develop - coming up with design direction, concept design and final designs in an iterative process through repeat prototyping and testing
4. Deliver - final design and production

Male, 30, Lead UX Designer at Honeywell Technology Solutions Lab.

1. User Research
2. Problem Framing
3. Concept Ideation
4. Interaction Design
5. Prototyping
6. Usability Testing

Female, 47, Freelance Web Usability Specialist and Technical Writer, formally Assistant Professor of Business & Technical Communication at West Chester University of PA, Associate, Professor of Technical Communication at the University of North Texas, Visiting Instructor of Communication at Western Kentucky University.

1. Identify a phenomenon
2. Research the academic literature
3. Formulate a research question
4. Identify appropriate publication venues
5. Design the study
6. Submit the study to the IRB
7. Wait
8. Recruit participants
9. Run the study
10. Analyze the findings
11. Write the journal article
12. Edit the article
13. Submit the article
14. Wait for reviews
15. Revise and resubmit

Male, Unknown Age, Assistant Professor in HCI at the National University of Singapore.

1. Research seminars
2. Contextual inquiry
3. Brainstorming
4. Rapid prototyping
5. Interactive design

6. User evaluation

Overall, survey participants provided clear and concise process flows but did not discuss the extent that each step influenced the next. This may have been a problem in the length and complexity of the question. A possible solution to this would have been to use a problem/scenario-based question and have participants explain the process of solving it. Still, an atypical workflow can be derived from the answers.

The first step that is shared across a majority of survey participants is an identification and framing period in order to understand the problem for which the design solution is attempting to solve. The second step that is similar across survey participants is an ideation or conceptualisation period, in order to brainstorm on possible solutions. Next, ethnographic and user-centric study is conducted to characterise and better serve the user a design is serving. After understanding the user, a period of prototyping and implementation occurs. Once a prototype is created, it is brought back to the client or user for evaluation and testing, the results of which are used to inform new versions of the implementation. This cycle is repeated however necessary, or however long one has during the development process.

Process steps seem to be very similar for people working in both the commercial and academic environment. Even though there was some variation in regards to the steps and processes, the similarities allow for the outlining of a common workflow that can be used for the purpose of the proposed toolkit presented in this dissertation. Figure 18 depicts this atypical workflow.

4.7. The Perceived Importance of Research, Prototyping and Testing

Likert-styled questions were asked by the survey in order to get a feeling of the importance of research, prototyping and testing within an experience designer's workflow. The six questions asked were subdivided into pairs. Each contained the statement *Please state the importance of* (research or prototyping or testing) *when participating in a project workflow cycle*, and were matched with the statement *Please state how much time you dedicate to* (research or prototyping or testing) *during an entire project or workflow cycle*. This was done to gain insight into which were perceived important versus how much time during a workflow cycle was actually dedicated to each task. The results are as follows for each question are as follows.

From looking at the results a number of insights can be derived. First, even if *research* for a project is perceived as *very important* (23 respondents
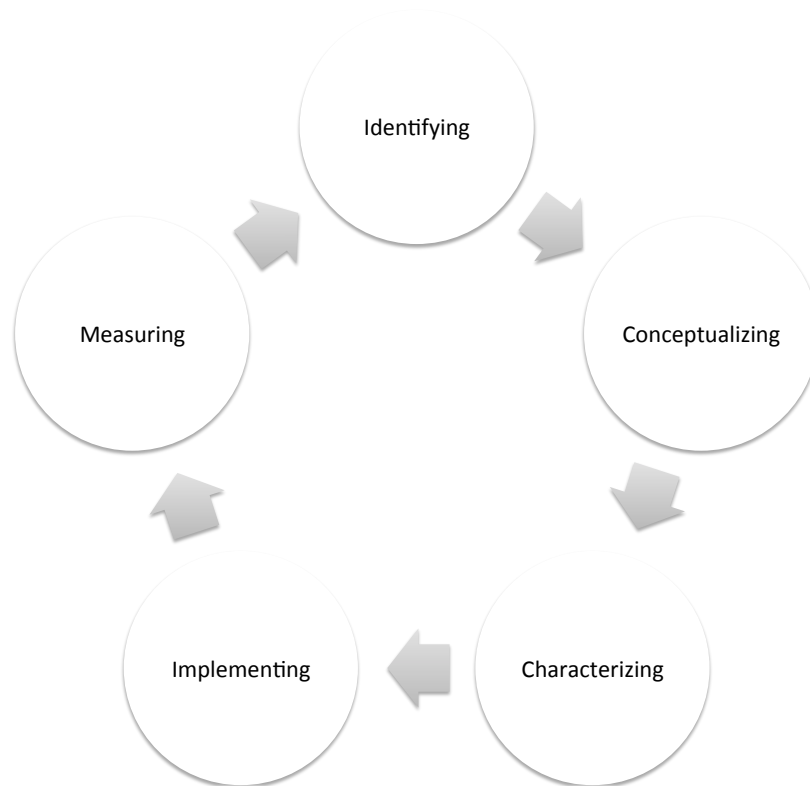
Figure 18: An atypical workflow based on the responses from the survey presented in this chapter
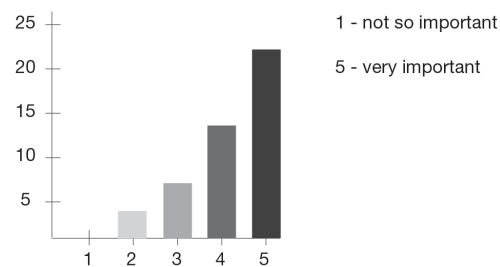

Figure 19: Total result of responses when asked *Please state the importance of research when participating in a project.*
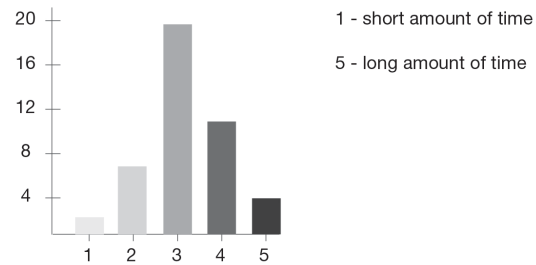
Figure 20: Total result of responses when asked *Please state how much time you dedicate to research during an entire project or workflow cycle.*
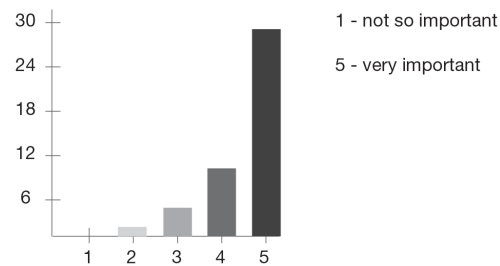

Figure 21: Total result of responses when asked *Please state the importance of prototyping when participating in a project workflow cycle.*
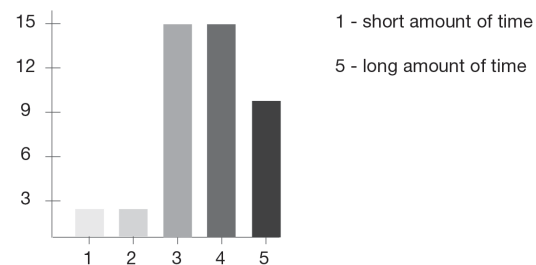

Figure 22: Total result of responses when asked *Please state how much time you dedicate to prototyping during an entire project or workflow cycle.*
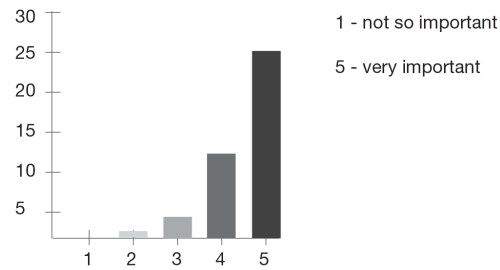
Figure 23: Total result of responses when asked *Please state the importance of testing when participating in a project workflow cycle.*
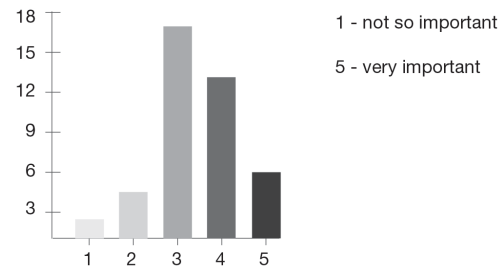

Figure 24: Total result of responses when asked *Please state how much time you dedicate to testing during an entire project or workflow cycle.*

or 55% of all responses depicted in Figure 19), 19 (45%) of respondents only dedicated a moderate amount of time towards the task (Figure 20). In regards to *prototyping*, a majority of 29 respondents (69%) believed that prototyping was very important to their work (Figure 21), and because of this, a total of 57% of responses indicated that they spend a moderate to long amount of time dedicated to prototyping (Figure 22). In regards to *testing*, 26 respondents (62%) indicated that testing was was very important to their workflow (Figure 23), yet 17 of the respondents (40%) indicated that time for testing was only moderately applied (Figure 24). These results may indicate that from the three tasks, research and prototyping take a more important role in the workflow process, with testing also important if there is enough time to do so. Considerations for work environment (academic versus commercial) might also be a factor, as participants who are working in the commercial field may have different amounts of time to execute each task. It can also be assumed that research tasks are more focused in the academic settings, especially in prototyping in order to qualify a theory or hypothesis. This is indicated by the responses in the previous subsections of this survey study.

5. Discussion & Conclusion

In summery, several insights as to the working nature of design researchers versus design practitioners was uncovered. *Experience design* seems to be practiced by a multiplicity of fields, focusing on the design and technology practices. Even if one does not label oneself as an experience designer, a full 100% of all participants, regardless of professional background or education, considered part of the work that they do to include the designing of experiences. This population includes graduate students, professional designers, artists, consultants, researchers and university professors.

Additionally, a definition of the term *Experience Design* could be synthesised from the survey responses. Using the responses and weighted list presented above, this definition would look to include the designing of products and processes that are created in service of the user's experience. WIth this apparent, Aarts and Stefano's definition of *Experience Design* as the practice of designing products, processes, services, events, and environments with a focus placed on the quality of the user experience and culturally relevant solutions [12] remains relevant and can be used as a contingent definition for the purpose of this dissertation.

The differences, similarities and challenges for experience designers working in the commercial and academic environments, as well as the challenges of working in multidisciplinary teams can also be gleamed from the responses offered in the survey.

In regards to the differences between experience designers working in the commercial versus academic fields, value for the profitability of the company compared to scholastic value in novelty, and publishing or decimating knowledge, seems to be the key differences in regards to aims. Outcomes also differ, in the sense that commercial works need to be robust and applicable to wide markets, whereas applications developed in the academic environment usually remains in prototype form in order to test or prove hypotheses or theories. Time span seems to loosely differ as well to some extent. In the commercial setting, allocation of time is constrained by the needs of a client, whereas in the academic field, longterm exploration and enquiry are encouraged. Finally in regards to flexibility, academic practice allows for room for failure, as it may provide valuable knowledge to a body of knowledge. In the commercial environment, failure can have critical implications such as loss of revenue. Failure in relation to the survivability of a company is often mitigated instead of accepted, such as in the academic work environment.

Similarities between experience designers working in the commercial versus academic fields focus on the tools and methods that are used, especially in the task execution order in workflow processes. In general, workflows across both environments include an identification and framing period so as to understand the current state of the problem being addressed, and ideation or conceptualisation (brainstorming) period to conceive possible solutions, user-centric study including methods from ethnography in order to contextualise and characterise the user a solution is being developed for, as well as periods of time for implementation prototyping, and then testing or measuring the effect of such prototypes on the target user or client. This distilled workflow cycle can be used as a map for the toolkit proposed in this dissertation.

From the responses provided by participants and through analysis using a weighted list, challenges when working across multidisciplinary teams include communication, language, process and understanding. From participants with an academic background, one professor from Honk Kong stated that communicating the feasibility of ideas to designers was a challenge. Another professor from Aarhus discussed the differing audiences between members of a multidisciplinary practice. Finally another HCI professor thought that spending time trying to understand members of a multidisciplinary team

takes effort. This is again due to the goals of each member, as well as the terminology that is used in varying fields.

In regards to responses from survey participants working in the commercial field, a creative director formally from Philips Design stated that managing different points of view and co-ordinating the different outputs into one cohesive whole was a challenge. Another senior designer, formally working at IDEO and OMA mentioned that transcending and coordinating disciplines in order to develop an overall experience that is more then the sum of its parts, was a main challenge. Overall, the challenges perceived by those working in both a research-based (academia) and commercial-based setting were more similar then different. This would support the assumption that a toolkit could be developed that is able to be used by both researchers and practitioners in the academic and commercial environments.

Finally in regards to the perceived importance of research, prototyping and testing, versus the amount of time allocated to the pursuit of each, some insights can be outlined. Generally, in both the academic and commercial fields, all three tasks are considered to be important to the process of developing solutions for users. Yet with the current tools employed, the amount of time dedicated to each step seems moderate at best. This may be due to several factors including access to resources or methods that allow for rapid execution during tight deadlines. With this in mind, a toolkit that collected easy-to-use and resource efficient methods could be valuable, especially in the commercial field, where time is the most rare of resources.

Several areas where the survey could be improved include the use of a scenario-based problem in order to better understand the workflow and problem-solving process between the various types of survey participants. Beyond wording of the questions as well as sample size to better reflect the target population, a more exhaustive list of questions, especially in the Likert-style could provide a means for quantitative data results.

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