Teaching Design with Personas

M. Cameron Jones   Ingbert R. Floyd   Michael B. Twidale

Graduate School of Library and Information Science

University of Illinois at Urbana-Champaign

501 E. Daniel St. Champaign, IL 61820 USA

mjones2@uiuc.edu, ifloyd2@uiuc.edu, twidale@uiuc.edu

ABSTRACT

The paper explores the effectiveness of persona-based design methods in HCI education. We describe the experiences of our students in learning, practicing, and using personas in a number of design contexts. From these experiences, we identify common patterns of use and misuse and characterize challenges in incorporating and using personas in the classroom. We conclude with advice on how to effectively teach design using personas.

Categories and Subject Descriptors

K.3.2 [**Computers and Education**]: Computer and Information Science Education - *Curriculum*.

General Terms

Design, Human Factors

Keywords

Education, personas, teaching design, design spaces, pedagogy

1. INTRODUCTION

It is well established that design is a key component of HCI work; researchers and practitioners refer to topics like "interface design", "interaction design", "usability design", etc. Given the strong design focus within HCI [9], it is surprising that design may not be explicitly taught. Rather, HCI educators have relied upon gifted designers to enter their programs and learn the science of HCI, building on their inherent design talents. Only recently has there been a stronger effort to teach design, as for example in Indiana University's HCI/d program.

Design methods emerged in design theory in the 1960's as an attempt to routinize design practice. The assumption behind much of the design methods movement was that design is a skill which can be practiced and learned. This assumption is echoed in the more recent writings of design theoreticians like Nigel Cross and his notion of "designerly ways of knowing" [7] which likens design to other disciplines such as science, and humanities which have scientific, and scholarly ways of knowing, respectively.

Borrowing from design theory, we have embraced a rapid, iterative design process as the core of our HCI pedagogy. Design is about the rapid exploration of a conceptual space [12], and

about considering as many possibilities as one can [1]. Of the numerous design methods developed within HCI, we prefer simpler, quicker methods as they have shallower learning curves, and shorter design "cycles" thus allowing for greater iteration. We have found personas to be one such lightweight method that is particularly effective at getting students to engage in, understand, and develop their skills at design.

Personas are "hypothetical archetypes of real users" [4]. They are based on an empirical understanding of user characteristics, and behaviors. Although still somewhat controversial ([2],[15]) they enjoy considerable popularity as a powerful design technique. Personas have been used extensively in usability research and practice (e.g., [6],[11],[17],[19]). Consequently there is a case to be made that teaching students about personas also helps them learn how to do effective user-centered design.

In our experiences of using personas in eleven different classes over the last five years, we have found personas to be a powerful technique for teaching design concepts. By developing personas, students are able to make design decisions that are much more contextualized than when they try to abstractly consider "users". Additionally, the simple exercise of creating personas emphasizes certain issues in design, and students are better able to think concretely about user groups. We have identified several common errors which students make when creating personas, some of which we have seen mirrored in personas published in the professional design literature. This indicates that these errors might be common-place misunderstandings of the method. By considering the likely causes of unsuccessful use of personas and effective ways of addressing them, we have developed recommendations for how to use personas productively in the classroom, as well as hints for how to identify poorly constructed personas, and how to turn these student errors into teaching exercises that can benefit the entire class.

1.1 Guiding personas for this paper

Personas, are effective communication tools; allowing designers to communicate with each other, but also those outside the design team. To help guide our writing, we found it useful to construct several personas, included here to clarify the intent of this paper.

John

John teaches interface design and digital libraries in an I-School. His classes have students from a range of academic backgrounds. He is somewhat skeptical of personas in general and of teaching them to undergraduates in particular. He suspects that it is all too easy for students to misunderstand and misapply the concepts, creating sloppy self-indulgent designs based on self-justifying fictions.

Mary

Mary teaches a number of design and HCI classes to computer scientists. She uses personas herself in her design work and is

thinking of including persona use activities in her next class. She'd like some shared experiences of this process to inform the design of effective learning experiences.

2. MAPPING A DESIGN SPACE

One of the most productive theoretical concepts we have used to understand the effective use of personas is the idea of exploring a design space. The concept of a design space has several meanings across different disciplines, and even perhaps within the HCI community. Below, we clarify our understanding of the term.

The notion of a space immediately brings to mind a Cartesian coordinate grid, with orthogonal axes representing its dimensions. In this sense, a design space is an extension of this metaphor to the design context, where the "dimensions" represent the multiple aspects and issues of a design problem. The Cartesian coordinate space metaphor allows people to reason about the world around them, modeling physical objects and interactions, and formulating and testing hypotheses. Similarly, a design space helps designers reflect on and reason about a design context and the relationship between a given form and the context. In a design space, a particular design artifact (e.g., a prototype) is a point, or region, in the space, i.e., a combination of the underlying dimensions of the space. Therefore, the design space as a whole is the world of *all possible* forms that can be generated as a combination of the dimensions of the space in response to a given design context, spanning all degrees of feasibility, and practicality.

What matters for any particular design activity are the dimensions of this space which impact the effectiveness of a proposed design, and how they interact—henceforth referred to as the relevant dimensions. Unlike abstract Cartesian spaces, the identifiable dimensions in a design space are not always independent or orthogonal. For example, Figure 1 is a depiction of a region of the design space of vacuum cleaners presented by Alexander [1]. The nodes represent several of the dimensions of the design space, and the links represent the relationships which hold among them, indicating complex dependencies.
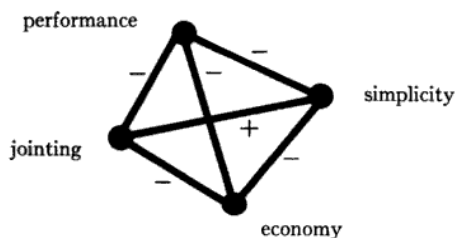

Figure 1. Alexander's (1964) depiction of a portion of the design space of vacuum cleaners.

The size of the relevant design space varies with the problem. Simple, tractable problems have small (i.e., low dimensionality), fairly constrained (i.e., well understood) design spaces. The number of possible solutions may be small enough such that the designer merely has to enumerate them and can inspect the correct (or best) solution. However, the problems of HCI and human-centered computing are more wicked [18], and wicked problems have wicked design spaces.

The dimensions of a wicked design space are not knowable (at least completely) before the design process has begun [1], [12], [14]. Some dimensions may be guessable or knowable ahead of time, in much the same way that most people would have been able to guess some or all of the dimensions depicted in Figure 1.

However, a fuller scoping of the design space can only be known through repeated exploration. The bulk of the design process is in fact identifying the variables or dimensions which define the relevant design space, and characterizing the relationships which hold among them. In the same way that wicked problems cannot be fully understood until a solution has been formulated [3], so too are wicked design spaces equally unknowable prior to the act of designing a solution.

Even if not logically impossible, it is often practically impossible to map out all of the major, relevant dimensions of the design space. However, successful design need not be exhaustive in this mapping activity. Engaging in good design requires the following:

1) Uncovering and identifying previously unknown dimensions of the design space. Brainstorming activities, prototyping, and empirical research are three ways of doing this. Different discovery activities uncover different kinds of dimensions, which is why it is important to use a variety of kinds of activities.

2) Exploring multiple points along the different dimensions of the design space in order to identify what kinds of effects each dimension has on the design; to uncover how different dimensions interact with one another (e.g., identifying Alexander's weights [1]); and to ensure that the design activities are not converging merely to some local maxima.

Thus, design is the process of mapping the design space and design methods are the compass and sextant of the designer. They are the tools with which the designer explores and characterizes the space. Design methods offer designers glimpses, or snapshots of the space. Building a prototype, for example, can cast light on the region of the design space in which that prototype exists. One can think of design as looking for a lost set of keys in a dark room. The designer is given a flashlight, which can be pointed around the room. The flashlight is not powerful enough to illuminate the entire space, however through much trial and error, pointing and inspecting, the designer can get a sense for the nature of the space and hopefully locate the missing keys.
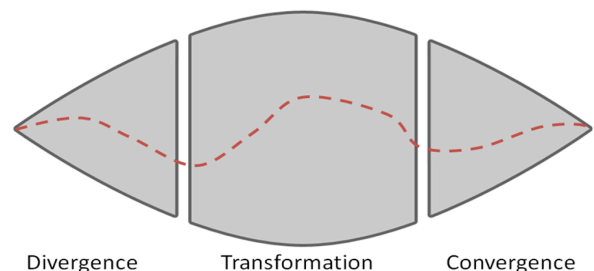

Figure 2. Jones's Divergence, Transformation, Convergence model of design. The dashed line represents a novice designer's hypothetical path through the design

This characterization of the design process is particularly similar to the "divergence" discussed by Jones [12] (see Figure 2). Jones's model presents another view of the design space. The space is expanded in the divergence phase where the designer expands their understanding of the design context, decomposing a problem and identifying the underlying issues and variables. This space is then explored through the transformation of ideas, materials, and situations in creative ways to identify novel "solutions". Solutions eventually convergence as the designer

narrows the design space by imposing constraints, removing assumptions, and reifying a final design.

Jones points out that "divergence" is where most novice designers have trouble; they often start making decisions about the design before enough information has been collected. The dashed line in Figure 2 depicts the course of a novice designer, adhering to a single design idea early in the divergence phase. This reduces the designer's experience to a narrow slice of all design possibilities rather than allowing them to experience the breadth of the design space. Personas, and other design methods, can be very useful in helping novice designers explore a broad range of ideas and issues in the early stages of design. In the following sections we will discuss how we have introduced personas as a design tool and reflect on their usefulness as an early design method paying attention to the particular difficulties students have had with them.

3. PERSONAS IN THE CLASSROOM

In the last five years, we have used personas in eleven different classes, spanning seven distinct courses, across undergraduate, masters, and doctoral levels, in both traditional and online formats. Course titles include Information Organization in Everyday Life, Interfaces to Information Systems, Scenario Based Design, Visualizing and Navigating Knowledge Networks, Rapid Prototyping and Evaluation, Computer Supported Cooperative Work, and Entrepreneurial IT Design.

Information Organization in Everyday Life was an undergraduate course on the principles of information organization and access. Personas were used as method for getting students to think about the information needs and information seeking behaviors of users other than themselves when designing the organization of their collections. The other courses introduced students to many different design methods, of which personas were just one. The objective was to give students a variety of tools to analyze design problems, generate design insights, and evaluate design decisions in order to triangulate ideas using several approaches. All of the courses had an emphasis on design, and personas played different roles in each; however, our experiences with personas in all of these classes were remarkably similar.

3.1 Teaching the Persona Concept

It needs to be clarified that there are a range of different kinds of and uses of personas. Generally, we adhere to the interpretation of personas characterized in Cooper [4] and Cronin [6] as an early-design method, which is rooted in real-world data of observed user characteristics and behavior. However, we also use the kind of ad hoc personas described by Norman [16].

The arguments made for the usefulness of personas for practitioners also apply to students: they force a clear focus on user-centered design, emphasize use by people unlike the designers, and enable discussion of strategic goals for the application by members of a multidisciplinary design team, including those who may not have software development skills. Personas enforce a degree of concreteness in design discussions, ideally avoiding the kind of unproductive abstractions that are so vague as to be interpretable in wildly different ways by different team members creating an illusion of consensus when in fact fundamental differences remain in the interpretation of the proposed solution, and indeed of the underlying problem.

Personas can help in addressing the two extreme pathologies of student design projects; the failure to get started due to excessive talking around the problem in overly vague language, and the rush

to dive into the details of implementation (e.g., coding) without sufficient thought about what is being designed/coded and why that is the best thing to do. Throughout a project, personas can help inform prioritization decisions as these need to be made and revised in the light of ongoing successes and failures.

Not surprisingly, personas are learned best when applied to actual design tasks. In some of our classes, scheduling required the personas readings to precede actual use in an assignment or in-class activity by a number of weeks. The recurrent comment from many students was that the persona idea only really made sense when used as a tool in an activity, even though they had diligently read and indeed actively discussed the materials in class.

4. STUDENT IMPRESSIONS & BENEFITS

The initial reactions of students to the concept of personas closely reflect the range of reactions of usability professionals and other designers to the idea. For some students, it is just obvious, merely an articulation and validation of how they think. For others it sounds intriguing, chiming with prior experiences in other disciplines. For a third group, they feel personas might be of use for others, but they doubt that they would benefit from it, and for a fourth group, it seems a very dubious method, at best a waste of time and at worst involving making up data, justifications, and reinforcing stereotypical thinking.

Although we have taught personas to students from a range of academic backgrounds, the majority of our students have a background in either computer science or library and information science (LIS). We consider these backgrounds in more depth, while noting that other disciplines (psychology, management, architecture, urban planning, education, to name the most common other backgrounds of students) have similar reactions.

For those with some background in interface design, some are already familiar with personas, but nearly all find the idea at least worthy of exploration and are willing to try it out. Indeed, for some the early reaction, as it is after reading the literature on the importance of broader user-centered design, is often of the form: "But why are they trying to make a case that is just obvious? Why doesn't everyone just do it?"

For those from LIS without a technical design background, they are often strongly empathic with the troubles that people have with poorly designed and inappropriate applications, and are keen to be an advocate for better usability and to learn how to run usability studies. However they can be reluctant to get involved in actual design. For such students, design is perceived as being done by others, and thus it is conveniently safe to criticize poor design. It can take considerable encouragement to get them thinking about how to fix poor designs, to understand that design is all about trade-offs, and that design fixes themselves can cause additional problems - sometimes worse than the initial problem identified. For such students, personas can be helpful in navigating an unfamiliar and bewilderingly large design space of options and changes, each of which has consequences for the overall user experience. Personas can clarify the underlying core goals of the design, help in assessing design options (although it can be dangerous if this is done too dogmatically) and in particular, help in guiding prioritization decisions, particularly when interacting with others and trying to articulate the issues involved in the navigation of the design space.

It is particularly interesting to note the parallels that students with backgrounds in the arts and the humanities draw as they wrestle

with the new concepts of personas, design, and iterative prototyping. Students have mentioned to us parallels they see with journalism (envisaging your audience, producing multiple drafts, rewriting and editing) creative writing (plausibility of characters and their actions) and theatre (considering issues from multiple perspectives). These parallels can help students make sense of design processes when at first glance they can seem quite disconcertingly alien.

For LIS students engaged in projects involving the redesign of interfaces to digital libraries, bibliographic databases and online catalogues, the use of personas can reveal their own differences from a typical user. Just as a computer scientist can accidentally design an interface that assumes special technical knowledge and understanding of computing technology that a less sophisticated user will find confusing, so can a librarian accidentally design an interface suitable for information professionals but bewildering to the majority of users. It is quite a revelation for LIS students to realize they are guilty of exactly the behavior that they have read about computer scientists doing in the generic HCI literature. Thus, the dangers of assuming the user has the same expertise you do are highlighted.

For many students from a liberal arts background, a major concern with persona use is the discussion of the use of 'stereotypes' as a desirable part of the method. This can be seen as a shocking and insensitive activity violating all the work towards greater diversity and inclusiveness in society and the workplace. The very use of the word can be sufficient to tar the whole method as ethically dubious. Clearly this issue needs to be addressed, since the concerns are sincere. Personas are effective because they are powerful mental shorthand, allowing us to assess the plausibility or otherwise of envisaged use scenarios. A persona is effective if there is agreement on representativeness, likely behavior, and it is easy to keep him/her in mind while designing. Stereotypical activities can help this. Personas are not intended to be rich, complex, thought-provoking characters in a novel, but rather quick tools to aid in design. Race and gender stereotyping in all settings is abhorrent, but certain stereotypes of needs from and likely reactions to software can be helpful - if plausible. Note that our own guiding personas in section 1.1 developed to help us envisage a potential audience for this paper, although hopefully plausible, deliberately violate gender stereotyping given the typical gender mixes in CS departments and I-schools.

For computer scientists who do not have an interface design background, the persona concept can seem very peculiar. It can seem like an annoying delaying tactic getting in the way of the 'real work' of coding, or an obsessing over subsidiary details of user experience before the functionality has been developed or even investigated for feasibility. The idea of making up users can seem hopelessly vague and arbitrary. This issue is even more problematic for those from a background in the natural sciences, where it seems suspiciously like inventing data to justify your hypotheses – a complete violation of the scientific method. This can require careful explanation to note that personas should not be arbitrary and should typically be informed by qualitative or quantitative empirical evidence, unless created for particular, context-specific reasons (see section 5.1.2).

5. PERSONA PATTERNS

We have found surprising consistency in the kinds of personas students create, both in creating good personas, and in creating

bad personas. In this section, we will review the commonly occurring personas we encounter in the classroom.

5.1 Effective Personas

One of the most productive ways we have used personas in the classroom is to aid in the exploration of a design space. In such exercises, there are a number of different kinds of personas we have found to be useful and productive for our students to create. In different classes, we utilized personas in different ways. Despite this difference, we uncovered some commonalities in how personas were used effectively.

The personas we describe here are not the only kind of personas which are useful in design work; however, they are particularly suited for classroom use because benefits of the methods can be reaped even if the methods are abbreviated for pedagogical purposes. This is not the case with other methods of generating personas, which often require a significant amount of data collection before their utility can be realized (e.g., [11], [17]).

5.1.1 Cooperian Personas

Cooper claims to have originated the persona concept [5], and is widely credited as the originator and the one who elaborated and popularized personas through his 1999 book [4]. However, some elements of the persona concept had been used by other practitioners and researchers. For example Lafraniere [13] notes the use of named characters in describing use scenarios: "This method seems to help users more clearly state their work and their relationships with other people." Lafraniere's 'proto-personas' are not fully fleshed out, and are mostly defined by role and activity rather than by interests or goals, but even this minimalist use was found to have certain benefits. What Cooper indisputably created, was a sophisticated and specific method of generating and using personas in design work [4], [5], [6]. This fact seems to have been lost by many of his imitators, and by many critics of the method.

The Cooperian persona is based on data collected through ethnographic study and observation. A large set of personas is created, and through a process of combining, integrating, and refining the personas, the set is winnowed down to a core set of mutually independent personas which represent the diversity of user characteristics, and behaviors observed.

Reproducing the fullness of the Cooper method in the context of a class project is challenging; we have not replicated it in its entirety. However, we felt strongly that, when possible, students should base their personas create on rapid ethnographies they conducted with real users. Thus, in several of our classes where personas were a major focus, our students built their personas on user research they had conducted.

5.1.2 Ad-hoc Personas

In classes where personas were less of a central focus, we had students explore the usefulness of personas for their particular design projects, either by developing new uses of personas, or customizing the technique for their particular needs. The results of some of these activities were personas that resembled the ad-hoc personas advocated by Norman [16]. These personas were not necessarily purely fictional in nature; however, the degree to which they are fictional or not depends primarily on the purpose for which they were created.

Students' ad-hoc personas were typically created for one of five purposes: to facilitate brainstorming; to facilitate articulation work; to describe design decisions; to begin work on translating

data or knowledge about users into other kinds of personas (e.g.: Cooperian personas); or as examples to help their fellow students understand persona-based design. For the first three purposes, ad-hoc personas were constructed as a way of communicating with others (e.g., are we designing for *this* persona?). Often, such personas were intentionally created as disposable, but served as an effective manner of bootstrapping the persona creation process. In such a role, ad-hoc personas can take any of several forms:

1) A propositional form: let us create a persona that exhibits a theoretical set of user characteristics (whether realistic or not) and use this persona to interrogate our design: how would our design be useful or not to this persona.

2) An illustrative form: let us create one or more personas to illustrate different ways in which we envision our design being used (when Paul uses our design, this is the outcome, when Lucy uses our design, that is the outcome).

3) An intuitive-archetype form: let us create a persona which captures our intuitions about a user group and its needs and characteristics before we have had a chance to investigate the real needs and characteristics (e.g.: on-the-fly persona creation during a conversation because talking about the needs abstractly does not fully capture our intuitions about them).

The purpose of the ad-hoc persona is typically for either brainstorming or for facilitating conversation: "Can this design handle this user? If not, what kinds of things have we failed to consider?" The things the designers have failed to consider are then candidates for new dimensions in the design space.

5.2 "Bad" Personas

Personas can be deceptive in their simple appearance; novice designers can struggle with constructing and effectively using personas. Students make consistent mistakes and we have noticed recurring difficulties with personas. These examples and discussions are not meant to be demonstrations of failure because although we call these personas "bad", we do not mean to imply that they are failures in anyway. Rather, they are part of an evolving understanding of personas as a design method, and are crucial connections in the learning process. Our intention here is to point out how subtle characteristics of a persona can have dramatic consequences on their effectiveness in the design process. Furthermore, we are inspired by the notion of "bad ideas" [8], and we present these personas as a means of analyzing and understanding the design of personas as method. By looking at these types of personas, we hope to better understand the limitations of personas and our particular pedagogical intentions.

As the notion of "bad ideas" suggests [8], not all of the personas in this section are necessarily bad—it depends heavily on how they are used. However, we discourage our students from using these kinds of personas. For most personas, we see only minimal utility from a "bad ideas" perspective even for a sophisticated persona user, and for all of them, it is far easier to use the personas incorrectly than it is to make good use of them.

5.2.1 Promotional Personas

One very common type of bad persona is what we call the promotional persona. Promotional personas are so named because they are created to promote the designer's assumptions and preconceived notions of what the design ought to be. Rather than constructing the persona on an empirical understanding of user needs and behaviors, the designer creates a persona around his or

her bias towards the design context. Promotional personas are the Trojan Horses of persona-based design; allowing a designer to think he or she is engaged in user-centered design, when really they are not. Promotional personas can harm the design process by reinforcing the designer's assumptions about the design, rather than breaking them down (as good personas can).

Promotional personas can be easy to identify. Often the personas have very particular wants or needs which, not surprisingly, the technology being designed can meet. Other characteristics of promotional personas include peculiar behaviors which the technology is being designed to support. For example, a group of students from one class created a persona who wanted a digital camera which had "multiple advanced editing" features, a set of features which the students were intent on designing and had no data to suggest that any user needed or wanted this feature.

Beyond existing without any empirical evidence to support them, promotional personas have been seen to even contradict empirical user observations. For example, in one course a student proposed a "one-month alarm clock" which would allow a user to program a monthly wakeup schedule into her alarm clock, waking up earlier or later as her schedule dictated. The student designer shadowed some friends and observed their interactions with time-management technologies, and asked people about their wakeup schedules. In her field notes, the student observed that the people studied typically had fairly regular wakeup schedules, and did not use many time management tools. It seemed they did not have much use for a monthly alarm clock. However, she constructed a persona who was the exact opposite of the observed users, one who woke up at different times every day, and was often late for appointments because she overslept. The student constructed the persona as a justification or rationalization for design decisions she had already made, in spite of her user research.

5.2.2 Elastic Personas

An elastic persona is a persona that could be about nearly anybody. Like Cooper's [4] elastic user, the elastic persona can be stretched until it is one step shy of being the anyperson. The power of the precision of personas is that they put sharp constraints on the possible behaviors of the supposed user. Thus, designers can avoid the trap of morphing the persona into any desired form that is convenient to support the arguments they are currently making about which direction to take in the design process. The following example of an elastic persona does not come from our students but from a real-world design context [10].

Sophie (32)

Sophie lives in one of the big cities and owns a first or second house/apartment together with her partner. She surfs the Web on a broadband connection and both the computer and the Internet play a central role in her daily life. She plays a couple of games on the Internet every week if her busy schedule permits it.

Sophie lives a busy life, combining her work and socializing with her many friends and close relatives. Her partner is also working his way up the ranks and they both have an above average education. Sophie is ambitious but also longs to start her own family. Playing games gives her a moment of rest in a busy day.

In their spare time Sophie and her partner like to go out, preferably with friends or family.

Sophie is an elastic persona because nothing about her is definite or specific. At first pass, it might look like Sophie is a real person, but everything about her can be questioned. In which city does she live? What games does she play, World of Warcraft, Solitaire, or Bejeweled? What did Sophie study in school? As we can see, little is really known about Sophie.

5.2.3 Twin Personas

Personas are never used in isolation; the designer typically creates an ensemble of several personas and interrogates the design context using the full cast of characters [4], [11]. Twin personas are two or more personas which superficially appear to be very different, but are very similar or identical with respect to particular dimensions of the design space. Using multiple personas is supposed to expand the design space by investigating a plurality of user characteristics and uncovering as many aspects of the design space as possible. Twin personas, however, limit the breadth of the design space which can be explored, effectively reducing the dimensionality of the design space, rather than expanding it as multiple personas should.

This is not to say that twin personas, or similar personas are not useful in design. They can be very useful for teasing out the subtle distinctions between different user archetypes, and can help focus the design during the later convergence phase. However, as tools in the divergent, early design phase they limit the amount of new information which can be gathered about the design space.

We have included excerpts from two personas created by students in our Entrepreneurial IT Design course. The students were designing a web-based customer-relations-management system.

John

John's business is located in a small town and this company deals with computer networking. He has 5 employees and these people usually bring in fiscal year revenue of $600,000.

John and his employees are always on the go. They are traveling all the time trying to gain and manage their clients. While the company is getting better, they are in need of a software package that allows them to keep track of their contacts. Microsoft Dynamics is a good solution to this problem but it cost too much for the company. This growing company is in need of a program that can manage their contacts but also be at a reasonable price.

Paul

Paul sells items online through Ebay. With a variety of items, Paul has racked in over $30,000. Currently after selling items to a buyer, it is hard to stay in contact with that particular client. If Paul has five different former clients who like a particular type of product, it becomes a hassle in trying to contact these people to try and sell them these items. Paul could buy A.C.T to help him manage his clients but A.C.T is very expensive and would severely cut into his revenues.

John and Paul appear to be very different, and indeed can be useful in generating and evaluating design ideas. However, what makes them twin personas is their essential similarity when it comes to the price and essential functionality of the software. We are not arguing that John and Paul are not useful personas, but personas are supposed to represent as diverse a set of characteristics and needs as possible to maximize the coverage of the design space.

Interestingly twin personas can be useful for identifying the designers' assumptions (both implicit and explicit) and design priorities. The dimensions in which several personas are similar or identical can be useful pointers in identifying the unquestioned assumptions of the designer. In the above example, John and Paul illustrate the designers' prioritization of price and "ease of use".

5.2.4 "My Mother" Personas

A "my mother" persona is a persona based directly on a known individual, a real human being. The inspiration for this name comes from the frequent use of parents and grandparents to inspire design intuitions when designing technologies for people who are less technically savvy, older, or less comfortable with technology (e.g., "we're designing this product for my mother"). However, it should be realized that relatives are far from the only real-world people who are the basis of "my mother" personas; other sources of inspiration include particularly eccentric users, users who are good sources of anecdotes, and even the persona creators themselves.

Personas *should* be based on designers' experiences with real people; however, Cooper warns against constructing personas out of specific individuals [4]. There are several problems with using real people in a persona. One is that the quirkiness of real people is not the quirkiness that is most useful for facilitating the exploration of the design space. It is not that your mother is not the archetypal user for whom you are designing, but rather, the particular quirks your mother has may not motivate productive conversations. This is not to say that personas cannot be quirky, rather quirks should be specifically selected in order to motivate the design exploration and conversation. It may also be too tempting when creating personas based on real people to include many of their quirks, including those which might not be directly relevant to the design. These additional quirks can distract designers from what is essential. However, some quirks can help in making the persona more memorable (Mary the motorcycling quilter) and so more mentally 'at hand' when considering design issues than a somewhat bland minimalist 'Peter the Persona'.

A second reason why "my mother" personas can be bad is that, to be most useful, personas need to be completely defined in the description. Every member of the design team needs to be able to come to a common understanding of who that persona represents, as all discussion is based on that common understanding. When one member of the design team creates a persona based on an acquaintance or relative, they run the risk of drawing on knowledge and experiences outside of the information contained in the persona text. Other designers are not privy to this information and therefore the power of personas to bring all designers to the "same page" is diminished.

A third reason is that creating personas based on known individuals does not encourage the same amount of reflection and synthesis. Creating good personas requires a bit of reflection to take visceral impressions and effectively translate them into a persona. These visceral impressions ought to inspire keen reflections on the nature of the users, use behaviors, and tasks being designed for. By asking questions, one can better approach the persona construction; appropriate questions might be: (a) How representative is this *user*? What characteristics or behaviors are common among other users, but not this one? (b) How representative is this *behavior* or specific observation? Is it common to many users, or idiosyncratic to this one? (c) What are the implications, if any, of the mere *existence* of a behavior or phenomenon (e.g., designing for accessibility)?

Consider the following example, which is based on the mother of one of the authors:

Katie

Katie is a kindergarten teacher. She is the mother of 6 children, all of whom have grown and moved out of the house. Katie likes to keep in touch with her children and likes talking to them on the phone. Recently, her school started using email in order to distribute internal memos and announcements. Katie is now forced to check her email daily. Now that everyone in the family regularly uses email, one of her sons setup a mailing list make it easier to keep in touch. Katie doesn't remember email addresses, and doesn't know how to use the address book feature of her email. Therefore, she never composes new messages, she only replies to messages. Katie often sends a message to the entire family list when she really only intends to send the message to one individual. She also references private phone conversations she had with one of her children in her emails. Thus, the children on the list often find themselves getting messages from their mother, totally removed from any conversational context which they may have been privy to.

In one sense Katie is an excellent persona representing a critical marketing demographic—the late adopter of technologies. However, although some of the general issues of adopting technologies initially developed for a business context to a social-family context are very wide ranging, the particular problems faced by Katie may or may not be representative, and therefore useful in exploring the design space.

5.3 Identifying Uses of Personas

In addition to the different kinds of persona that students may create, another set of misconceptions about the purpose of personas can lead to various kinds of persona use that can be limited or problematic. As in persona creation, there is diversity in the ways in which usability professionals have productively used personas. The persona use that we advocate might best be described as being a guide while exploring a large complex design space. In such a setting, dozens of design decisions have to be made and it may not be possible to explicitly evaluate every single one. Indeed at fine granularity it may not be cost effective to explicitly talk or even think much about each decision. However, having a persona can help guide those myriad decisions. This somewhat implicit use complements the more explicit discussions of the plausibility of personas comfortably using a debated feature or interface, as outlined by Cooper.

We have also identified some less desirable uses of personas. It is less desirable to use personas solely for 'validation' of a design (i.e., after a series of design decisions have been made doing a validation of the form "So, do we think Mary will be able to use that?"). Validations can be helpful, but are only a tiny part of effective persona use, and are particularly vulnerable to the error of modifying the persona to fit the existing design instead of vice versa. Once a lot of effort and emotion has been sunk into a design, it is very tempting to consciously or unconsciously modify the element that is easier to change in order to make the two fit. Students who do not fully grasp the underlying concepts of personas, what they are for, and the design pathologies they are intended to help prevent are most liable to tweak personas. It is important to realize that, as students are initially learning about personas, it is entirely appropriate for them to realize that the persona they have developed is problematic enough to need revision—this is part of the learning experience. However, such

alteration for learning purposes is very different in its pedagogic usefulness from the persona-tweaking that must be avoided.

Another kind of persona tweaking design validation can encourage is post-hoc justification of design decisions, often through the invention of additional richer detail about the persona. Again, such fleshing out can in some circumstances be justifiable, but always needs to be challenged by questions such as "are you just making that up to make your design idea look better?" Incidentally, this is a concern raised by Marshall about persona use by designers, not just students [15].

Another kind of persona use we find less desirable is when they are solely used for considering functionality to be provided. This is a very important use, but it fails to take full advantage of the method by stepping through various use scenarios to see if the design is both useful and usable. Naturally, students need to be reminded that personas do not remove the need for other kinds of systematic evaluation of usability, especially various kinds of user testing. However if used honestly, personas can be a powerful, low cost, first pass method. If one struggles to justify how one's persona will manage to use the software, it seems rather unlikely that it will work better in reality. The contrary is definitely not the case–just because the assessment of the persona using the application in a detailed scenario fails to reveal problems does not mean that actual use can be expected to be unproblematic. Rather, it means the design is ready for more cost-intensive steps.

6. TIPS FOR HOW TO TEACH PERSONAS

6.1 Do not "over think" personas

For some students, personas are intuitive and natural to create; other students struggle to grasp the concept. We advocate a minimalist introduction to personas using at most a single characterization of the method (we use Cooper's Chapter 9). Minimizing the discussion of what personas are and what they are not, can help reduce students' fears of failing or "doing it wrong". We find discussions of personas are always better when real examples are being discussed, not just abstract concepts, which brings us to our next recommendation.

6.2 Do not hesitate to get started

Norman's ad hoc personas [16] can be created with little more than an intuition about users. These intuitions may be wrong, but usually they are somewhat accurate. When viewed as a starting point to a longer-term discussion of design, these initial personas can afford to be wrong, as the students will iterate and fix them, or replace them with new personas over the course of the design.

6.3 Have students collect data

Lightweight ethnographic observations, or interviews of a small number of users, can be done quickly enough (i.e., in a single class session) allowing students to be able to create personas which draw on empirical data almost immediately. Furthermore, the data collected will inform other aspects of the design, other than the persona creation.

6.4 Have students share their personas

Having students share their personas with each other, and discuss and critique them is beneficial both to the persona creators, but also the rest of the class. The persona creators get feedback on how to improve their persona description possibly incorporating knowledge other students have gained about: users from their observations, and personas from their own work writing them.

Also, the discussions help the students come to understand what the method is, how it can be used, and what its limitations are.

6.5 Have students create multiple personas

This recommendation not only comes from Cooper, but every study we have seen which uses personas has used an ensemble of them. Creating multiple personas helps the students (and designers) stretch their notions about the design, often the act of having to create a third or fourth persona forces students to recognize a broader context to their design, or other possible applications and use scenarios they hadn't thought of before. It also gives students additional practice in creating personas.

6.6 Do not let personas languish

Perhaps the most critical recommendation is to keep the personas active throughout the design. By this, we mean that the students should continually revisit and reference the personas as they are thinking about the design and engaging in other design activities. This may require the personas to be revised as the design context changes, or it may require subsequent decisions to be reevaluated if they do not align with the goals of the personas. Either way, the personas should be iterated with all other design artifacts.

6.7 Engage in longer-term design projects

Perhaps the best way to ensure that all of the previous recommendations are followed is to have students use personas in the context of a larger design project. We have tried teaching methods serially, where each is applied in a microcosm of a weekly activity, and students are then left to apply them to end-of-term projects. These classes have been less successful than classes in which students engaged in a single design project (or very small number of projects) over the entire term and have the opportunity to apply numerous methods (including personas).

6.8 Use other methods alongside personas

Personas are not the ultimate silver bullet design tool. Many issues are better addressed by other methods. We believe the best designs are those which arise from the comparison of observations, findings, and insights generated from multiple methods. Utilizing multiple methods can help triangulate points in the design space and lead to better design.

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