

DRS//CUMULUS//Design-ed 2015 Chicago, Illinois, USA

LearnxDesign

The 3rd International Conference for Design Education Researchers

Designing Financial Literacy: Research x Community

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Abstract: *Financial literacy is of critical importance both globally and locally, yet existing financial literacy programs often neglect the behavioral factors that drive financial decision processes. As a result, the design of financial literacy materials rarely integrates the behavioral. To be effective, materials must adopt a multidisciplinary perspective encompassing ideas from behavioral economics and visual communications, and draw on the results of quantitative and ethnographic studies of individual behavior. The authors present the framework for an undergraduate course incorporating these ideas to develop financial literacy materials. Working with a community partner that provided an in-depth look at the financial literacy needs of economically-vulnerable individuals in New York City, students developed a series of narrative visualizations, culminating in comic strips highlighting dilemmas in one individual's financial life. At the course's conclusion, the authors discovered that the course structure and background resources (which included results of quantitative research and readings about poverty and financial decision-making) had not sufficiently supported students in developing empathy. Because of this, input from our community partner proved critical in helping students create appropriate visual stories for their low-income clients.*

Keywords: *narrative visualization, community engagement, financial literacy, decision-making*

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Introduction

Community-engaged design has received increasing focus in design education: an understandable consequence of the fact that design problems are often complex or 'wicked' (Buchanan, 1992, Rittel & Webber, 1973), and frequently occur in contexts in which deep understanding of the problem context from community partners is necessary for the design to be effective. We present here the framework for a design course, which adopts a multidisciplinary approach, incorporating both quantitative and ethnographic research, and drawing heavily on the experience of a community partner organization.

Our partner provided insight into their low-income clients' needs, and highlighted the challenges of fostering student comprehension of and empathy for individuals very different from themselves.

Special Topics in Strategic Design and Management: Visualizing Finance was offered for the first time in Spring 2015. Working with Neighborhood Trust Financial Partners (NTFP), students completed a series of assignments leading up to a final project in which they created comic strips depicting financial decision processes. The comic strips were designed as supplementary materials for NTFP's financial counseling programs with low-income clients. Both the NTFP counseling program and our course were influenced by the theory of Dialog Education (Vella, 2011), a pedagogical method for changing habits of mind and behaviors. The Visualizing Finance course content had four major elements: quantitative, ethnographic and secondary research methods; the intersection of several scholarly theories (behavioral economics, theories of metaphor, narrative visualization and storytelling); the wicked problems of financial behavior and decision-making; and the design problem of creating appropriate and engaging visual stories.

In this paper, we discuss the rationale, structure and progression of the course, and assess the final student design projects. We also discuss our ongoing efforts to help students gain insights into their and others' financial attitudes and decisions while creating relevant and socially valuable narrative visualizations for community-based clients.

The Global Problem of Financial Literacy

Special Topics in Strategic Design and Management: Visualizing Finance was designed to address the growing problem of financial literacy, both domestically and internationally. On the national level, recent fluctuations in the domestic economy, rising levels of inequality, consumer debt, and challenges of retirement planning among an aging population have all heightened the need to ensure that individuals are well informed and able to make appropriate decisions for their long-term financial health. Concerns about income inequality have also focused particular attention on the problems of the poor. These forces play out on a global level as well, and an increasing body of research has demonstrated the economic importance of a financially-educated public (Lusardi & Mitchell, 2013).

Following the 2008 recession, a number of governmental agencies and non-profit organizations in the US and elsewhere increased their public education efforts (e.g. the Financial Literacy Research Consortium, Wise-up, Money.gov). The OECD and the World Bank have made efforts to increase the reach of financial literacy programs worldwide (Klapper & Husnain, 2009; Yoong, Mihaly, Bauhoff, Rabinovich & Hung, 2013). Despite these efforts, surveys have found persistent low levels of financial literacy globally (Lusardi & Mitchell, 2011). At the same time, there has been an increasing recognition that the

educational model in which information is simply imparted should be altered in favor of one that focuses on changing financial behaviors (Yoong, 2011). Applying insights from psychology and behavioral economics, a few newer programs incorporate the complexity of factors that affect how individuals make decisions.

Research from behavioral economics (Kahneman 2003, 2011) asserts that individuals' financial behaviors do not stem from 'rational' decision-making processes but are affected by systemic biases due to limitations in information and available time and concentration, as well as by pre-existing beliefs and cultural conditioning. As Yoong (2011) notes, individuals' limited attention causes their decision-making to be disproportionately affected by the most recent or most apparently relevant information; this also increases individuals' tendency to collect and retain information that reinforces their current beliefs or understandings (Mullainathan & Shleifer 2005, referenced in Yoong 2011). The framing or context within which decisions are made also has an impact: consumers, for instance, are more likely to accept additional fees for using credit cards if the additional charges are added automatically while 'discounts' are given for cash payments (Thaler, 1980). These effects suggest that the metaphors underlying the framing of a financial situation are crucial, and that individuals' decision-making is affected by their fundamental conceptual metaphors about money (Shön & Rein, 1994). Finally, financial behaviors are also largely dependent on the society and culture of the individual (Henrich et al., 2005).

Incorporation of these factors into financial literacy programs has been slow despite the substantial evidence that an increase in financial knowledge is not correlated with changed financial behaviors (Schmeiser & Seligman, 2013; Fernandes, Lynch & Netemeyer, 2014), and that more context-based techniques can be more effective in improving some financial behaviors (Drexler, Fischer & Schoar, 2010). Many existing programs solely deliver financial information: see, for example, Money Smart, an online program hosted by the FDIC or the Five Tips series hosted by the Federal Reserve at <http://www.federalreserve.gov/consumerinfo/fivetips.htm>. Recently, both the OECD and the World Bank have expanded their focus from financial literacy/knowledge to financial capability/behavior (Yoong, 2011; Yoong et al., 2013). Explicit in this new direction is an understanding that financial behaviors are affected by a host of (non-rational) factors including individuals' underlying beliefs and emotions around money.

Cultural factors play an important role too. The Russia Trust Fund of the World Bank, in focusing on low-and middle-income countries, has highlighted the importance of availability and reliability of financial services in different countries, and on using locally-defined norms for defining desirable financial behavior (Holzmann, Mulaj, & Perotti, 2013). The fundamental themes are consistent: keeping track of spending and working within a budget, planning for unforeseen circumstances and for the future, and knowing where to go for help. However, the specific obstacles, challenges and behavior patterns differ greatly among societies (Holzmann et al., 2013).

Despite these modest improvements, most global and national financial literacy programs have not substantially incorporated behavioral considerations. The most-recent (2012) OECD statement on 'National Strategies for Financial Education' only addresses financial understanding and use of various financial services: 'Depending on national circumstances, policy priorities can include increased access to, and use of, appropriate financial services, more suitable saving and investment, reduced indebtedness and more responsible credit, improved level and quality of saving for retirement and related pension

issues, as well as savvier decisions vis-à-vis risk and insurance’ (http://www.oecd.org/daf/fin/financial-education/OECD_INFE_High_Level_Principles_National_Strategies_Financial_Education_APEC.pdf). Jump\$tart’s 2015 National Standards mention that ‘financial literacy is more than just knowledge or information; and that the ability to use information and resources is key’ without articulating how behavioral aspects can be addressed (http://www.jumpstart.org/assets/files/2015_NationalStandardsBook.pdf).

The importance of behavioral and social factors in individuals’ financial decision-making suggests that the creation of financial literacy programs should be attuned to the social, emotional and behavioral contexts of their audiences. It is no longer sufficient to illustrate concepts with graphs and charts of quantitative information; rather, illustrations should reflect the larger metaphorical, psychological and culturally specific contexts in which individuals make decisions. However, this practical integration of behavioral insights into financial literacy materials creates a significant challenge around the design of those materials and this may be a barrier to their adoption. The authors have argued previously that an appropriate design tool for this purpose is narrative visualization (Fry, Wilson & Overby, 2013). While narrative visualizations can take many forms (editorial cartoons, comic strips, animated sequences), they are united in being metaphor-rich with an emphasis on character and setting. These qualities help ground the financial content in the emotional and cultural context in which financial decisions are made.

Pedagogical Context

An emphasis on personal experience and storytelling is important not just in the creation of financial literacy materials, but also in the educational process itself. The authors drew on the theory of Dialog Education to help students understand the challenges encountered by clients during NTFP counselling sessions. Developed in the early 1980s by Dr. Jane Vella, Dialogue Education emphasizes engagement in active learning tasks in which participants ‘(1) draw from their own experience (inductive work); (2) engage with new information and skills (input); (3) work with the content (implementation); and (4) reflect on its relevance to their own lives (personal and professional) (integration)’ (<http://www.globallearningpartners.com>).

Our course (*Special Topics in Strategic Design and Management: Visualizing Finance*) introduced students to experiences that allowed them to explore their own financial decisions (inductive work); readings and design activities that added understanding and skills (input); two small visualization projects in which they applied these insights and skills to content (implementation); and a final project that synthesized all these into a visual story (integration: in this case reflection on its relevance for a target audience).

Inductive work began in the first week of classes with the *MoneyWorkshop*. Developed by Dr. Kirsten Bonde Sørensen, the *MoneyWorkshop* is a participatory practice based on developing new knowledge out of pre-existing understandings. Bonde Sørensen uses a method she terms *generative design* (Bonde Sørensen, 2011, p.3-4), which has parallels with Dialog Education: ‘... Generative design makes us see things as they *could be* and empowers everyday people to generate and promote alternatives to the current situation’ (Bonde Sørensen, 2011 on Sanders, 2006). In the *MoneyWorkshop*, participants visualize their financial past and present through ‘collages, maps, stories, plans and/or memories’

(Bonde Sørensen, 2011, p.3) and use these to develop a personal financial statement or goal. The exercise employs visual metaphors to describe past financial behaviors and the ways in which they shape present behaviors: 'people's values are rooted in mental models, these values steer and control our way of thinking and acting and, [through repetition] these values become habits' (Bonde Sørensen, 'Using Visualization To Change Your Money Behavior,' presentation, Feb 2, 2015).



Figure 1 MoneyWorkshop at Parsons, Feb 2, 2015

Generative design helps workshop participants develop deep insights from past experiences as illustrated by Sleeswijk Visser, F, Steppers, P, J and Van der Lugt in Figure 2.

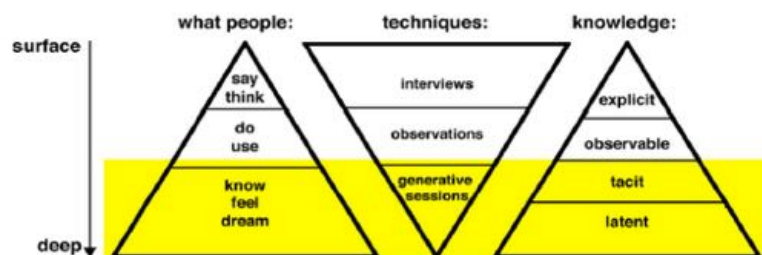


Figure 2 Sleeswijk Visser, F, Steppers, P, J and Van der Lugt, R's model showing how different levels of knowledge about experience are accessed by different techniques (2005.pp 4)

This diagram relates how people act with what they know and how they feel. The bottom level (shaded yellow) re-enforces the notion that generative sessions can make tacit latent knowledge visible through accessing what people know/feel/dream. By uncovering the otherwise hidden emotional and social factors underlying individuals' latent knowledge of financial concepts, generative design allows participants to reflect on their past experiences, opening the possibility for changed behaviors. Our students' experience in the workshop attuned them to the drivers of individuals' financial behaviors, and began to give

them a design language for expressing these emotional and cultural drivers. They learned to incorporate behavioral elements and to integrate them with design practices.

Dialog Education and Generative Design both put the experience of the learner at the forefront and emphasize past experience (emotional, cultural, etc.) as a foundation for new knowledge and behavior. While the *MoneyWorkshop* provided students with inductive learning experiences, the transformation of these insights into narrative visualizations required them to implement or externalize this knowledge and behavior for a specific clientele.

Modes of Research: Informational and Experiential

Because the factors that drive individual behavior are so complex and audience-specific, it is necessary for content developers and designers to use a multiplicity of approaches when researching the needs, challenges and contexts of specific audiences. Effective designs for financial literacy and other behaviorally-driven decisions must therefore embrace detailed quantitative, demographic and anthropological methodologies. This includes surveys about specific needs, challenges and resources of the target audience or community, as well as detailed ethnography/design research from focus groups, case studies, etc.

In the field of financial literacy, quantitative methods dominate. There is an extensive body of research on financial literacy and capability, both internationally (OECD and others) and locally (New York City Mayor's Office of Financial Empowerment research <http://www.nyc.gov/html/ofe/html/publications/research.shtml>). However, the bulk of this research either measures financial understandings, or reports which topics are offered by financial-literacy programs. Very little research gives insight into financial behaviors.

In attempting to conduct research about individuals' financial behavior, additional obstacles arise—especially among low-income populations—for several reasons:

1. Personal finance can be a sensitive and stress-inducing topic, about which subjects may be unwilling or unable to give information.
2. Low-income individuals are often unavailable as research subjects due to other demands on their time.
3. Financial behaviors tend to be patterns spread over long periods of time, rather than discrete events, making observational research difficult.

To supplement existing quantitative research, one of the authors has begun a research project, collecting data from New York City financial-counseling programs that serve low-income individuals to determine which financial issues are most pressing for their clients (Overby et al, in process). Some of these data were used in the class to indicate which topics to pursue.

Recently, researchers in financial literacy have begun to incorporate a more qualitative approach. One example of this can be seen in the financial diaries of individuals in developing countries collected by Collins et al. (2009). A similar US-based diary project has just launched (US Financial Diaries; issue brief <http://www.usfinancialdiaries.org/issue3-informal>). In these diaries, subjects self-report their financial behaviors and use of financial resources. However, even the diary research can have limitations, as Sleeswijk Visser (2009) observes:

Talking with people by, e.g. interviewing them, provides information about what people can say, which is mainly explicit knowledge. Observation studies give insight into the physical context of people, and how people do things. Generative techniques use the creativity of people to become aware and express their own experiences. Creative tools or self documentation techniques (Gaver et al., 1999; Mattelmaki, 2006a) help people reflect on their memories, feelings, motivations, create awareness about their experiences, express in a visual form, and use these representations as a basis for talking about the experiences (Stappers and Sanders, 2003). The benefit lies in the mix of experience information gained from these different types of methods. (Sleeswijk Visser, 2009, p. 17)

A first-hand account of the concerns of the American working poor can be found in Tirado's *Hand to Mouth: Living in Bootstrap America* (2014). This book, a primary text for the course, enabled students to cross-reference Tirado's anecdotal accounts with quantitative data and survey-based methodologies. The book was important in bridging research on poverty with individual personal experience, as exemplified by Tirado herself.

Integrating Multi-Disciplinary Theories

Special Topics: Visualizing Finance is a 4000-level undergraduate course in which students explore concepts of financial behavior, and then depict individuals' behaviors using visual metaphors and storytelling to create narrative visualizations. Background information, which spanned multiple academic disciplines, was presented to the students as needed, with the objective of making the theory self-evidently relevant for students and facilitating its integration into the visualizations. These topics and disciplines are

I. FINANCIAL LITERACY INITIATIVES (AND CRITIQUES)

The purpose and importance of financial literacy was discussed, based substantially on the work of Lusardi et al. (2011, 2013) and Yoong et al. (2011, 2013). Students critically examined the proportions of programs devoted to certain issues and the communities for which these programs are intended. Students reviewed materials produced by existing programs: particularly those that emphasize financial information, those that account for financial behavior, and those that utilize visual communication. The goal of this was to develop student understanding of the current financial literacy landscape and to identify opportunities for intervention.

II. FINANCES (AND ECONOMICS) OF THE POOR

Students read excerpts from Tirado (2014) and several financial diaries (Collins et. al., 2009; U.S. Financial Diaries). They were encouraged to develop an understanding of the dynamics of what is often broadly referred to as the 'poverty trap:' to understand the financial management strategies of many of the world's financially vulnerable, and to develop critical perspectives on the role and possible limitations of financial literacy in those lives. The goal of this was to develop student understanding of and empathy for the individuals and communities they are designing for and with.

III. BEHAVIORAL FINANCE AND DECISION-MAKING

The work of behavioral psychologists and pioneers of Behavioral Economics, (e.g. Kahneman 2011) describes the many emotional, psychological and cultural drivers of

financial decision-making. Among these drivers are cognitive biases that affect people's decisions; also the heuristics, or mental shortcuts, that people use to make decisions about complex situations involving risk, probability, affordability and other aspects. The goal of this was to build awareness of the dominance of emotional and cultural factors in decision-making.

IV. METAPHOR THEORY

Through reading selections from linguists Lakoff and Johnson's (1980) ideas about conceptual metaphor, students began to identify their own everyday uses of metaphor and consider why we use metaphor and how it functions. Students also explored Schön's theory of 'generative metaphor' in which metaphors can give rise to new understandings and basic assumptions (framings). The goal of this was to develop students' understanding of the power of metaphor (text-or image-based) to facilitate comprehension and retention of new information.

V. STORYTELLING AND VISUAL NARRATIVE

Readings from the storytelling guides of comic book artists such as Eisner (2008) and McCloud (1993) introduced students to visual strategies such as framing, gestalt (use of the gutter), and word/image dynamics. The goal of this was to develop students' visual storytelling capabilities for designing financial literacy materials.

Practice and Partnership

Our partner organization played a critical role in the course. Neighborhood Trust Financial Partners (NTFP) is the largest provider of financial-literacy services to low-income individuals in New York City, offering programs in conjunction with the NYC Department of Consumer Affairs, Office of Financial Empowerment. Established in 1994, NTFP forms partnerships with community-based organizations to provide financial-empowerment *services* such as financial counseling and assistance and financial-empowerment *products* such as bank accounts, credit cards, and loans through their FDIC-approved Credit Union. NTFP especially serves low-wage workers (the financially vulnerable 'working poor'): their clients have an average annual income of \$18,000, typically possess less than a high school education and have had no previous banking relationship (<https://neighborhoodtrust.org/the-challenge/>).

In late 2011, NTFP updated their financial-counseling curriculum with the help of Global Learning Partners (GLP), using the principles of Dialog Education (a proprietary methodology disseminated by GLP). A team from NTFP—including financial advisors, team supervisors/financial counselors and the CEO—worked with a single point-person at GLP, who suggested the use of a single storyline to run through the new 5-week program. The NTFP team developed 'Emma's Story': a text-based fictional composite derived from the financial-counseling experiences of the team, highlighting the financial topics and questions that 'we wanted people to think about when they read the story.' The story is about 'people getting outside of their shoes and thinking about other people's problems: what advice would you give her? And [in the process] uncovering other conversations such as whether using a furniture rental facility is a good financial decision.' (T. Phillips, personal communication, 16, Feb., 2015).

The NTFP/GLP collaboration produced the 'Getting Ahead' financial literacy workshop (https://neighborhoodtrust.org/wp-content/uploads/2014/05/NTFP_Getting-Ahead_Brochure.pdf), which places an emphasis on behavioral factors and incorporates 'Emma's Story.' The new curriculum based in Dialog Education was introduced to NTFP staff in a weeklong training led by GLP (T. Phillips, personal communication, 16, Feb., 2015).

The authors' agreement with Neighborhood Trust Financial Partners allowed us usage of the Emma materials, and established a timeline for interaction with NTFP over the course of the project. However, as the semester progressed, our collaboration with NTFP evolved from a more traditional designer-client relationship (in which it was understood that we were to provide a comic strip based on Emma) to one in which NTFP counselors became co-designers and invaluable resources in the development of both the narrative and the visual strands of the comic strip.

Special Topics in Strategic Design and Management: Visualizing Finance

The authors have written, at some length, about the *narrative visualization* approach and its potential application to the design of financial literacy (Fry A., Wilson J., & Overby C., 2013). The impetus behind *Special Topics in Strategic Design and Management: Visualizing Finance* was to test the practicalities of creating a narrative visualization for an established local financial literacy provider, using the classroom as a laboratory for integrating interdisciplinary theoretical frameworks as well as working collectively with the visual components of the comic-strip medium. The course was populated by thirteen senior (4th year) BBA students from the Strategic Design and Management program at Parsons. Students understood the course as a research-oriented studio employing visual communication to promote behavior change. Perhaps not surprisingly, the course proved much more complex than originally foreseen and it yielded some unanticipated insights.

The semester began with three practical warm-up exercises. In the first class session, students were asked which of several financial topics identified through research by one of the authors (Overby, in process) they believed to be the most important for low-income individuals. Their replies were then compared to the research findings, highlighting the importance of conducting quantitative research rather than relying on designers' beliefs or insights. The second exercise was the previously mentioned *MoneyWorkshop*. The third was the '\$70-A-Week Challenge' which asked students to track their expenses over a single week, limiting their spending to \$70: the amount a low-wage person might have available after paying rent, utilities and transportation. Many of our students at Parsons are accustomed to spending much more than \$70 per week, so this exercise was designed to encourage reflection on the difficulties of working within a budget and to develop empathy with low-income individuals. These experiences, we hoped, would help them to shape realistic narrative visualizations of financial behaviors.

We also assigned two financial-narrative design projects. In Project 1 teams of students created photographic fumetti to depict a financial decision from their own lives. Because the student demographic in our design school is primarily (not exclusively) from the upper income quintile worldwide, and the ages of the students fall within a narrow band (19-22 years old), their range of financial responsibilities and experiences was quite limited. Therefore, the narratives they created focused exclusively on consumption and cash management (budgeting) topics such as impulse buying (see Figure 3) or choosing public

transportation over taxi services. Basic needs were not generally addressed. In addition to exposing the income and experience gap between the Parsons students and the majority of NTFP's financial-counseling clients, Project 1 raised students' awareness of their own (usually limited) experiences with money, and encouraged them to extend their understanding of others' financial realities.



Figure 3 Project 1 fumetti depicting a purchase decision at a NYC sample sale.

Despite reading-response exercises and discussions about poverty in the U.S., student narratives consistently contained bias errors (see Figure 4). For example, they overestimated the range and quality of the financial resources available to Emma to assist her in a crisis and proposed low-to-no-interest loans from family or friends as solutions to Emma's immediate problem: an improbable option for our character. Another issue that emerged was students' limited ability to extrapolate imaginatively when developing scripts. This seemed to reflect a failure to understand the interconnectedness of elements in a low-income person's financial life: for example, exactly how and why a relatively minor event (such as a traffic fine) can cascade into much larger consequences (such as loss of one's vehicle, then one's job, then home). Although students had read first-person narratives (Tirado, 2014) and in-depth analyses (Collins et al., 2009), the authors found them unable to apply these insights as rapidly or intuitively as we had expected.

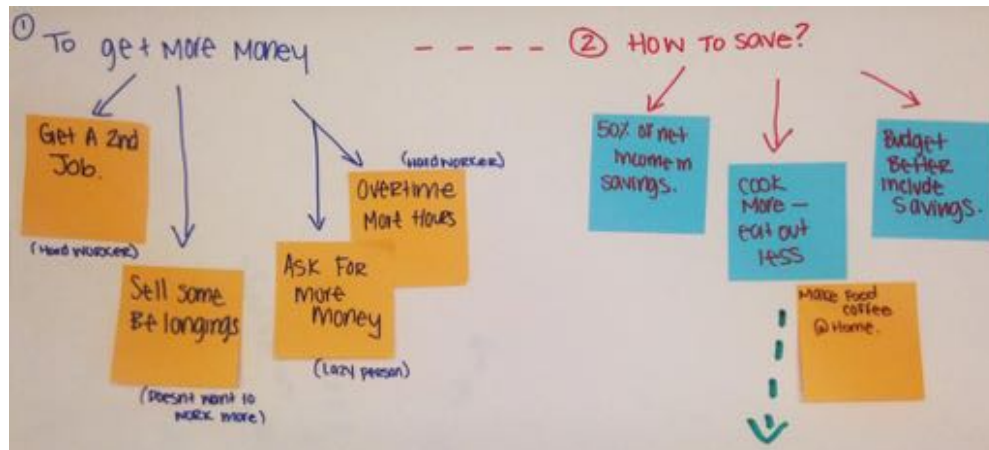


Figure 4 Student visualizations of possible options for Emma: annotations show attitudes toward poverty and 'solutions' for Emma's situation that reveal misunderstanding of Emma's reality.

Students also had difficulty integrating ideas from behavioral economics into the comic-strip medium, especially in regard to the effects of bias on decision processes (an aspect we had chosen to highlight). This may have been partially due to insufficient examples of financial heuristics (or rules-of-thumb): although numerous examples of financial heuristics have been developed by the financial planning community for middle- to high-income clients, most were not applicable to our target (low-income) population.

One goal of the visualization project was to employ visual metaphors as shortcuts to deeper understanding, and as 'sticky' elements within each strip to aid viewers' retention and recall of the financial concepts. In practice, creation of visual metaphors was a complex undertaking—akin to inventing our own rules-of-thumb—and often interrupted the flow of the story. Nevertheless, students did create an effective visual metaphor in Emma's (leaning) tower of needs in Project 3.

Key findings from Project 3:

- Comic strips are hard to create and comic strips by committee are much harder to create: there are very good reasons why most comics are single-authored.
- Creating resources as drawing aids was not as effective as we had anticipated. Basic drawing skills were still needed.
- NTFP advisor drawings demonstrated a deep understanding of their community and of individuals' journeys through the financial-counselling program, but these insights (see Figure 7 and discussion below) could not be integrated directly into the comic-strip storylines.
- The role of empathetic understanding turned out to be a huge factor: the experience/empathy gap between our students' and Emma's worlds led to delays
- and disputes over content throughout. It was very important to posit our community partner as expert, and therefore final arbiter, of these discussions. That said,

biases continued to make their way into the drawings, even at the level of the way in which figures and faces were drawn. This led to much revision and lost time.

From a visual design perspective, Project 1 emphasized two basic principles: (i) facial expression and body language as emotional vehicles, and (ii) iterative development of the strip, emphasizing economy of storytelling. The story line focused on the decision process and context.

Project 2 was the first attempt to integrate aspects of our theoretical framework with a prototype 'Emma-based' narrative strip. Developed by NTFP as an archetypal financial counseling client, Emma is a relatable character for NTFP's clients: a single mother whose financial narrative provides points for discussion at each of the five stages in NTFP's five-week 'Getting Ahead' workshop.

Table 1 A synopsis of the five key features of 'Emma's Story,' adapted by the authors from 'Your Getting Ahead Financial Action Plan,' copyright 2012 Neighborhood Trust Financial Partners.

week	Emma's Story, key features	Financial literacy workshop content element(s)
1	wants to pay off debt, think ahead, seek financial advice	self-assessment/behavior; long-term goals >upward spiral; understanding the system
2	use of furniture rental, check casher, ATM fees; costs caused by lack of time and capital	financial services: self-assessment of use; information about interest, institutions, alternatives; minimizing costs
3	income from child support vs. 2nd job; work with counselor on budget; didn't like idea of budget but found savings	budgeting: self-assessment of spending behaviors, tips for spending less
4	itemize debt; plan for paying down debt; loan request from friend/family member	debt and credit: self-assessment of emotions around debt; credit report and score; how to manage debt and build credit; negotiation skills
5	identify long-term goals and create a financial action plan	financial action plan: saving, long-term goals

Project 2 focused on scripting a situation that would exemplify and extend one of the financial themes of Emma's story—supported by theories of behavioral finance and visual storytelling. Project 3 was conceived as a more fully-realized version of Project 2, with counselors from the community partner involved as critics and (aspirationally) as co-designers of the final strips. The first question that arose with the partners was how closely to follow the existing Emma's story. This question and others were resolved gradually through a series of structured feedback sessions and meetings with NTFP counselors.



Figure 5 Emma character sketches (first drafts). NTFP counselors expressed preference for the second (middle) Emma but elements from drawings 1 and 3 were also used in the final character.

During the first two weeks of Project 3, student-generated narrative ideas (in storyboard form) were sent for review and critique to NTFP's financial counselors. Using their demographic data, we also worked with individual NTFP counselors to develop the Emma character, which was subsequently critiqued by a larger group of counselors. After discussion with our partner, we decided to highlight a single financial principle: the importance of developing an emergency (or reserve) fund.

On April 3, student representatives and instructors from Parsons visited NTFP's Washington Heights offices during their bi-weekly financial counselor meeting. On the suggestion of Tyler Philips (Senior Associate Director of Programs at NTFP) we conducted a visualization workshop with the financial counselors. Counselors were asked to focus on Emma's 'inner monologues' around the building of an emergency fund, using three principles from the 'Getting Ahead' workshop: describe how you feel about your financial reality, identify a long term wealth-creation goal, create a vision for yourself and described actions you will take right now to Get Ahead.



Figure 6 NTFP financial counselors doing visualization work April 3, 2015



Figure 7 Sample of 'Emma-based' visualization work, done by NTFP financial counselors Michelle and Fernando, April 3, 2015

After reflecting on the counselors' visual and narrative work we considered whether the narrative visualization should be one continuous story, two parallel stories (Emma's life with and without an emergency fund) or a two-part (before and after an emergency fund) sequence. We (NTFP and Parsons) settled on the two-part story, as follows:

PART 1 STORY SYNOPSIS:

Emma receives a phone call from her mother, who is being released from the hospital and needs Emma to take care of her at home for two weeks. Emma is overwhelmed by this. She has a pile (or tower) of needs to attend to (rent, employer, clients, daughter, and now mother): how will she handle all of them? She'll need money to cover her unpaid time off work, but has no emergency fund or access to a bank loan. Her only options are borrowing from a loan shark or using a pawnshop. She chooses to pawn the family's computer and TV, but this removes her daughter Rachel's homework tool and Rachel's source of entertainment while Emma is at work. Emma later tells her friend that life cannot go on this way and her friend suggests she call 311 to see a financial counselor.

PART 2 STORY SYNOPSIS:

As Emma relates to her friend that she has established an emergency fund, Rachel spills milk onto the family computer. It will have to be replaced. At the store Emma has three options: rent, finance or buy outright. Because of the emergency fund she is able to buy it, saving money by avoiding finance charges. Emma feels empowered; Rachel is proud and grateful.

Class methodology

The class was divided into two teams (one for each storyline), with four additional students appointed to art director roles. These student art directors developed visual resources, liaised with instructors and community partners, and ensured visual consistency in the work being developed. Art directors were also responsible for creating and

disseminating style guides and visual resources for the strips, refining the script, and conducting final quality control.

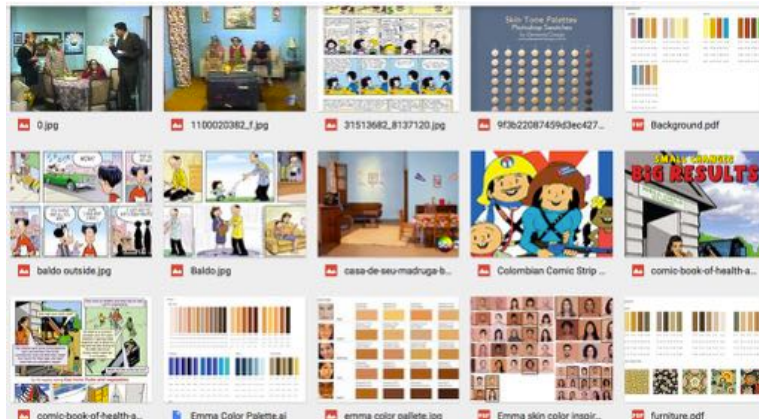


Figure 8 Sample online shared color and style resource, Fernanda Kanamori Kuba, Parsons, 2015

Student groups produced numerous iterations of the strip and were ultimately able to ‘finish’ Project 3 to the extent that that they created a coherent two-part comic-strip narrative, including finalized characters, text, speech and thought bubbles, color schemes and patterns, and all background art. At the time of writing pre-press work is being finalized by the authors and their research assistants. The following is a sample page from Project 3 at semester’s end:



Figure 9 Sample page, Part 2 story, page 1

Discussion

Despite the careful sequencing of student assignments and projects, a number of difficulties arose as the semester unfolded. Some of these stemmed from the complexity of the task (both from a conceptual and design perspective), others from students' difficulties in understanding the financial realities of a low-income individual like Emma.

Aside from specific issues related to the creation of the comic strips, a more fundamental question emerged, regarding the sometimes-conflicting responsibilities the authors had: to students and to our partner organization. Was the primary function of the project to provide a structured learning experience for the students, or to provide NTFP with finished products to best meet their needs? As community-engaged projects continue to become more central to design-school pedagogy, these questions are likely to remain relevant and open.

Conclusion

Special Topics: Visualizing Finance was an ambitiously conceived course, both in terms of content and of design expectations. The multidisciplinary theoretical strands that wove together ideas from behavioral economics, financial literacy, and visual communication were complex; also, the students had to make connections between the underlying quantitative and ethnographic research and the specific context of their storylines. Even when those connections occurred, they did not always inform the final drawings, as the group process encouraged a kind of homogeneity or 'group think,' with ideas sometimes voted down as 'too corny' or 'not professional' without reference to the target-audience context.

A persistent problem was the students' existential distance from NTFP's clients, which led to misunderstanding of the true nature of the difficulties low-income individuals face, and occasionally to a lack of empathy. Despite the extensive resources available to the students, and knowledge of the challenges in developing good financial literacy materials, student efforts did not always translate into successful designs. The authors later realized that they had emphasized the theoretical background over providing students more-immediate experiences to help them embody their characters' financial and social realities. This is an ironic echo to our own critique of the many financial-literacy programs that focus on conceptual—rather than—behavioral aspects.

In the successes that did occur, a crucial factor was our relationship with individuals in our partner organization, who became active participants in the design process. The partnership role will continue to evolve, particularly as the authors develop the comic strips more fully for effective use by the NTFP's financial counselors.

Overall, we conclude that community-engaged projects dealing with complex topics such as financial literacy CAN work—but it's important to be clear at the outset about the overriding purpose of the arrangement. Are the outcomes primarily pedagogical (such as 'how can one leverage multi-disciplinary research into more-effective financial literacy visualizations?'), or are they about design product ('how does one produce such a thing?'). Our primary lesson was that achieving both purposes would require more time, better integration between theory and practice, and more-structured empathy-building exercises.

Acknowledgements: Research assistants Maria Fernanda Flores Rodriguez and Priscila Williams provided invaluable support for the course and for this paper.

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