

# LearnxDesign

The 3rd International Conference for Design Education Researchers

## Designing Financial Literacy: Research x Community

for the 16 February LEAVE BLANK Author's First Name(s) LAST NAME<sup>a</sup>, Second Author's First Name(s) LAST NAME\*<sup>b</sup> and Third Author's First Name(s) LAST NAME<sup>a</sup>

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### **Abstract:**

*Financial literacy is of critical importance both globally and locally, yet existing financial literacy programs tend to neglect the behavioral factors that drive financial decision processes (Yoong, 2011). We assert that effective designs for financial literacy and other behaviorally-driven decisions must utilize both data-based and qualitative approaches, and that design students need training to achieve this balance.*

*The authors present here a framework for an undergraduate design course that draws on evidence-based research to identify the financial literacy needs of economically-vulnerable individuals in New York City, and encourages students to develop critical thinking about the methodologies and underlying assumptions of existing financial-literacy programs. The framework also helps students to incorporate multiple techniques of research, and draws on theories of financial behavior and visual communication; then it helps students expand their design skills as they create financial-literacy materials with a community partner.*

*The framework presented here is widely applicable beyond financial literacy, to any domain in which behavioral and cultural factors drive decision-making.*

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

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## Introduction

In any discipline there are pedagogical approaches that become commonplace and normative. Qualitative research has held a preeminent place in design education in the last thirty years: 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 an ethnographic approach is necessary for the design to be effective. We present here a framework for a design course in which other research methodologies—including pedagogical frameworks, quantitative research and bodies of scholarly theory—play an equally large part. We discuss the rationale, structure and progression of the course, *Special Topics in Strategic Design and Management: Visualizing Finance*, that is being offered for the first time in Spring 2015. For their final project, students will produce comic strips depicting financial behaviors; these will then be used by our community partner to enrich their financial counseling programs with low-income individuals.

The course structure is influenced by the theory of Dialog Education (Vella, 2011), a pedagogical method for changing habits of mind and behaviors. The course content is informed by three major elements: quantitative research; the intersection of several scholarly theories (behavioral economics, theories of metaphor, narrative visualization and storytelling); and the wicked problem of financial capability. Students use data from more-traditional survey research, along with substantial investigation of relevant theories from numerous disciplines, to gain insight into the experiences and behaviors of their end users.

In this paper, we present the complex theoretical strands that relate to financial behaviors, and the use of a variety of methodologies that enable students to create relevant and useful narrative visualizations for financial literacy. In the process of creating socially-valuable designs, students will acquire design skills and understanding of an important global problem, as well as insights into their own and others' financial attitudes and decisions.

### *The Global Problem of Financial Literacy*

*Special Topics in Strategic Design and Management: Visualizing Finance* is 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 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 to a country's economic health 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 stepped up their public education efforts (c.f. the Financial Literacy Research Consortium, <http://www.ssa.gov/pressoffice/pr/flrc-pr.htm>, [Wise-up, Money.gov](http://www.wise-up.gov)). The OECD and the World Bank have made efforts to increase the reach of financial literacy programs worldwide (Klapper & Husnain, 2009; Yoong, Mihaly,

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Bauhoff, Rabinovich & Hung, 2013). Despite these efforts, surveys have found persistent low levels of financial literacy globally (c.f. Lusardi & Mitchell, 2011). At the same time, there has been an increasing recognition that the initial 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 behavioral psychology and behavioral economics, a few newer programs incorporate the complexity of factors which affect how individuals make decisions.

Research from behavioral economics (Kahneman 2003, 2011) suggests that individuals’ financial behaviors do not stem from “rational” decision-making processes but are affected by systemic biases due to limitations in information, available time and concentration, as well as pre-existing beliefs and cultural conditioning. As Young (2011) notes, individuals’ limited attention causes their decision-making to be disproportionately affected by the most recent or most apparently relevant information, as well as increasing 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 metaphor underlying the framing of a financial situation is crucial, and that individuals’ decision-making is affected by their fundamental conceptual metaphors about money (Shön & Rein, 1994). Finally, financial behaviors is also largely dependent on the society and culture of the individual (Henrich, Boyd, Bowles, Camerer, Fehr, Gintis,... Tracer, 2005).

Incorporation of these factors into financial literacy programs has been slow despite the substantial evidence that an increase in financial literacy is not correlated with changed behaviors (Schmeiser & Seligman, 2013; Fernandes, Lynch & Netemeyer, 2014) and that more context-based techniques such can be more effective in improving some financial behaviors (Drexler, Fischer & Schoar, 2010). Many existing programs solely deliver financial information (c.f. Money Smart, an online program hosted by the FDIC [https://www.fdic.gov/consumers/consumer/moneysmart/overview\\_program.html#boi](https://www.fdic.gov/consumers/consumer/moneysmart/overview_program.html#boi), or the Five Tips series hosted by the Federal Reserve <http://www.federalreserve.gov/consumerinfo/fivetips.htm>). Recently, both the OECD and the World Bank have expanded their focus from financial literacy to financial capability (Yoong 2011; Yoong et al., 2013). Explicit in this new direction is an understanding that financial behaviors are affected by a host of (non-cognitive) 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 guidelines 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](http://www.oecd.org/daf/fin/financial-education/OECD_INFE_High_Level_Principles_National_Strategies_Financial_Education_APEC.pdf) ). JumpStart’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](http://www.jumpstart.org/assets/files/2015_NationalStandardsBook.pdf)).

The importance of behavioral and social factors in individual’s financial decision-making suggest that the creation of financial literacy programs must 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 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*

The emphasis on personal experience and story-telling is important not just in the creation of financial literacy materials, but in the educational process itself. The theory of Dialog Education informs the pedagogical structure of our course, as well as the financial literacy workshop with which students are collaborating. Developed in the early 1980s by Dr. Jane Vella, Dialog Education emphasizes engagement in active learning tasks in which participants “(1) draw from their own experience; (2) engage with new information and skills; (3) work with the content; and (4) reflect on its relevance to their own lives (personal and professional)” (<http://www.globallearningpartners.com>).

This four-part learning sequence can also be summarized through the four i’s (Vella, 2001, p.33):

1. Inductive work - connecting learners with what they already know

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2. Input - a learning task that invites them to examine new input (concepts skills, or attitudes)
3. Implementation - a learning task that gets learners to do something directly with the new content
4. Integration - a learning task that integrates this new learning into their lives.

The sequencing of *Special Topics: Visualizing Finance* takes students through a first project that explores their own financial decisions (inductive work), then readings and design activities to add understanding and skills (input), then a second project in which they apply these insights and skills (implementation), and a final project that synthesizes this into a visual story (integration: in this case for a target audience).

A deep method of inductive work that also begins the acquisition of design skills was the *MoneyWorkshop* which our students participated in during their first week of classes. This workshop, developed by Kirsten Bonde Sørensen, uses a method she terms *generative design* (Bonde Sørensen, 2011, p.3-4). This is a participatory practice based on developing new knowledge out of pre-existing understandings: "... 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 this workshop, participants visualize their financial past and present using "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 engages 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).

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 these with design practices. Generative design helps students work at a deeper level, as illustrated by Sleeswijk Visser, F, Steppers, P, J and Van der Lugt in Figure 1.

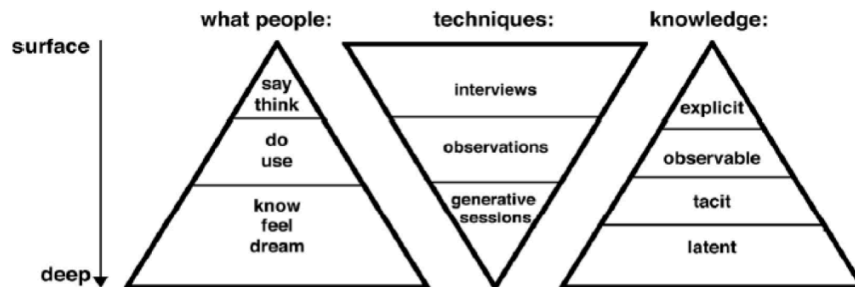


Figure 1. Sleeswijk Visser, F, Steppers, P, J and Van der Lugt, R's model showing how different levels of knowledge about experience are accessed by different techniques (2005.pp 4)

This diagram visualizes the relations among how people act, what they know and how they feel. The bottom level 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 and behavior.

Both Dialog Education and Generative Design put the experience of the learner at the forefront, with an emphasis on past experience (emotional, cultural, etc.) as a vehicle for new knowledge and behavior. In the *Special Topics: Visualizing Finance* course, these ideas arise in three contexts: in student insights about their own (and others') financial behaviors; as embodied in the narrative visualizations that the students create; and as experienced by future viewers. But while Generative Design and Dialog Education both seek to draw out latent knowledge and underlying conceptual and behavioral patterns, the creation of Narrative Visualization seeks to articulate conceptual and behavioral patterns by focusing on a narrative framework that encompasses a range of emotional and cultural specifics (Fry et al. 2013, 2014).

Because the factors that drive individual behavior are so complex and so audience-specific, it is crucial that content developers and designers use a multiplicity of approaches to research 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 both 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.

### *Modes of Research: Informational and Experiential*

While qualitative and design-based research techniques like Generative Design give deep insight, other types of research serve other purposes. In the field of financial literacy, more-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.

Researchers in this community have recently begun to conduct some user-centered research, such as 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.

Even the diary research can have limitations, as Sleeswijk Visser (2009) observes:

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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)

When considering research methodologies to inform the students’ design efforts, conducting qualitative research—especially among low-income populations—is quite difficult 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.

Instead, students will draw upon data generated by research conducted by one of the authors (Overby et al., in process). This survey research sought to investigate demand for financial-literacy topics among New York City financial-counseling programs that serve low-income individuals. Telephone surveys with counselors/directors asked

- Which financial topics the program addresses.
- Which of these topics occur most frequently.
- Which topics appear to cause your participants the most anxiety/unhappiness.
- Which topics are easiest to resolve/most difficult.
- What cultural, emotional, or psychological factors seem most important in your participants’ financial decisions.

*Table 1 The results of the surveys*

**2014 Survey of NYC Financial Literacy Programs**

numbers indicate sum of responses: for each respondan 0 = not mentioned; 0.5 to 2 = mentioned with increasing intensity

	Budgeting	Credit	Debt	General Finance	Money Mgmt	Savings
Specified on website	1	12	11	9	10	10
Offered	8.5	12.5	10	5	8.5	8
Most frequent	2	10	7	1	2	2
Most anxiety-provoking	2	3	6	3	2	0
Easiest to resolve	1	8	4	0	1	2
Totals	14.5	45.5	38	18	23.5	22

Categories are those identified by the Office of Financial Empowerment, NYC Department of Consumer Affairs

Total programs surveyed 21



The results of this research provide user-centered evidence of the topics and behaviors that are best candidates for students' narrative visualizations. This type of data-based research is not the only or best methodology, but we emphasize it here in contrast to the dominance of qualitative research in design education. Multiple methodologies are necessary in this course and in other design courses, because each is limited. When designing a course students must be exposed to all of these methodologies, and to understand the advantages and limitations of each.

### *Integrating Multi-Disciplinary Theories in a Design Course*

*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. This work is supported by scholarly theories across several disciplines, which we present to students "just in time" when needed for the understanding and creation of the materials students produce. This approach makes the theory self-evidently relevant for students, and insures its integration into the narrative visualizations they create. These topics are

#### *i. Financial Literacy initiatives (and critiques)*

Based substantially on the work of Lusardi et. al. (2011, 2013) and Yoong et. al. (2011, 2013), the purpose and importance of financial literacy is discussed. Students critically examine the proportions of programs devoted to certain issues and the communities for which these programs are intended. Students review 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 is to develop student understanding of the current financial literacy landscape and to identify opportunities for intervention.

#### *ii. Finances (and economics) of the poor*

Students will read Tirado's (2014) personal experiences of being working poor in the US, as well as academic investigations of poor people's financial behaviors and attitudes via financial diaries (Collins et. al., 2009; U.S. Financial Diaries, <http://www.usfinancialdiaries.org>). Students are encouraged to develop an understanding of the dynamics of what is often broadly referred to as the "poverty trap," to develop an understanding of sources of income, habits, problems and decision processes 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 is to develop students understanding of and empathy for the individuals and communities they are designing for and with. The careful research process reported in the financial diaries projects will also reinforce the importance of well-constructed methodologies in validating results.

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*iii. Behavioral finance and decision-making*

The work of behavioral psychologists and pioneers of Behavioral Economics, (c.f. Kahneman 2011) describes the many emotional and cultural aspects of financial decisions making. Among these are cognitive biases that affect people’s decisions and the heuristics, or mental shortcuts that people use to figure out complex situations involving risk, probability, affordability and other life decisions.

The goal of this is to make students aware that emotional and cultural factors drive decision-making, and that such concepts as biases and heuristics are important to depict when designing financial literacy materials.

*iv. Metaphor theory*

Through reading selections from linguists Lakoff and Johnson’s (1980) ideas about conceptual metaphor, students will begin to identify their own everyday uses of metaphor and consider why we use metaphor and how it functions. Students also explore Schön’s theory of “generative metaphor” in which metaphors can give rise to new understandings and basic assumptions (framings).

The goal of this is to develop students’ understanding of the power of metaphor (text- or image-based) in facilitating comprehension and retention of new information; also to recognize metaphor’s potential for influencing behavior. Students will then explore ways to integrate visual metaphor in the design of financial literacy materials.

*v. Storytelling and visual narrative*

Readings from the storytelling guides of comic book artists such as Eisner (Eisner 2008) and McCloud (McCloud 1993) present design techniques regarding framing, gestalt ideas such as use of the gutter, condensation of story and word/image dynamics, and demonstration of their use in storyboarding and cartoon-strip prototypes.

The goal of this is to develop students’ visual storytelling capabilities in the design of financial literacy materials.

**NEW MATERIAL IN THIS SECTION (TO ADD IN LATER IF PERMITTED):  
IMAGES FROM THE CLASS ILLUSTRATING OR EXEMPLIFYING EACH CONCEPT I. - V.  
SEE REQUEST LETTER.**

## ***Practice and Partnership***

The interwoven strands of theoretical context will inform three student projects during this course. While the first project is drawn from students’ own financial decision-making experiences, the second and final projects are in collaboration with an organization that provides financial education programs for low-income individuals.

### **Background**

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 partners 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 targets 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) and the principles of Dialog Education (a proprietary methodology disseminated by GLP). A team of about a dozen NTFP individuals—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 fictional composite derived from the experiences of the team, highlighting the financial topics and questions that “we wanted people to think about when they read the story.” [The story] was 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.”

The NTFP/GLP collaboration produced the “Getting Ahead” financial literacy workshop ([https://neighborhoodtrust.org/wp-content/uploads/2014/05/NTFP\\_Getting-Ahead\\_Brochure.pdf](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 week-long training led by GLP (T. Phillips, personal communication, 16, Feb., 2015).

### **The projects**

Project 1 uses photographic fumetti to depict a financial decision from our student’s lives. The student demographic in our design school is primarily (not exclusively) from the upper income quintile worldwide. Because of this, and the ages of the students themselves, their range of financial decisions and experiences is quite narrow and they tend to focus on consumption and cash management (budgeting) topics such as impulse buying or choosing public transportation over taxi services. Basic needs are not generally addressed, as these students have little experience in budgeting for survival. This exposes an interesting gap between the experiences of the student producers of financial literacy materials for low-income adults, and consumers of it (in this case the clients of NTFP). Project 1 in some senses raises students’ awareness of their own (usually limited) experiences with money, and encourages them to position and reflect on themselves as actors in their own financial dramas.

In projects 2 and 3, the saliency of the topics has been established in advance by the community partner. Therefore the emphasis of these projects is on depicting someone’s decision process, using design skills, research findings and theoretical frameworks to develop culturally sensitive and effective financial literacy material. The validation and

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testing of the resultant narrative visualizations will be undertaken in collaboration with our community partner.

Projects 2 and 3 will use characters and circumstances based on the financial story of a low-income single mother (“Emma”), from the NTFP “Getting Ahead” curriculum. During this five-week workshop, “Emma’s Story” provides a narrative arc that echoes the trajectory of topics covered (see Table 2).

*Table 2 A synopsis of key features of “Emma’s Story” adapted 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 has not yet begun at the time of writing. Students will use “Emma’s Story” as a narrative framework for the experiential and reflective dimensions of Dialogue Education, which students will seek to further support through the visualizations they generate. Students will attempt to illustrate how Emma could utilize rules of thumb to assist with her financial planning and decision-making. As students move away from telling their own stories to working with the constraints and complexities of a fictional archetypical financial literacy client, they begin to incorporate aspects of behavioral/heuristic theory while testing the ways that metaphor can enrich and reinforce the workshop’s content elements.

Project 3 will entail the deepest engagement with our community partner. In this module, students will gather information from financial counselors and from community members in locations near Neighborhood Trust Credit Union. They will then work in teams to create behaviorally-oriented narrative visualizations (comic strips or animations) to

support the “Getting Ahead” workshop. Students begin this project in March, 2015; details are still to be determined.

NEW MATERIAL IN THIS SECTION (TO ADD IN LATER IF PERMITTED):  
EVIDENCE FROM THE CLASS, CO-DESIGN AND ASSESSMENT, SEE REQUEST LETTER

## *Conclusion*

Through the sequence of these projects, students move from examining their own experience to incorporating results of research and creating relevant and useful design output. Course outcomes reflect this complex process, as students

- a. reflect on personal financial decisions (project 1)
- b. relate these insights (from a.) to theories of behavioral finance
- c. identify the most-important topics to illustrate, validating their hunches against existing research data
- d. question whether storylines can affect behavior
- e. develop visual narratives
- f. apply aspects of behavioral finance and metaphor theory to storylines
- g. apply visual design techniques to storylines
- h. gather insight/critique from community partners
- i. integrate insight/critique into designs
- i. learn about target population: identify the financial realities of low-income individuals, and validate these identifications from secondary research
- j. query community members about content relevance and cultural relatability of designs

The clear need for behaviorally-oriented financial literacy materials requires designers to develop narrative visualizations of complex and culturally-embedded stories. A rich theoretical background and multiple research methodologies help students design within the complicated space between financial information and emotional and cultural patterns of financial decision-making. Students use a framework in which quantitative and ethnographic methods interact with and complement each other: a dynamic widely applicable beyond financial literacy, to any domain in which behavioral and cultural factors drive decision-making.

## References

- Bonde Sørensen, K. (2011). Designing as a language for self-dialogue and value clarification: *Proceedings of the Design Research Society 2012: Bangkok* (Vol. 1, pp.151–171).
- Buchanan, R. (1992). Wicked Problems in Design Thinking. *Design Issues*, 24(2), 5-21.
- Collins, D. & Morduch, J., Rutherford, S., & Ruthven, O. (2009). *Portfolios of the Poor: How the World's Poor Live on \$2 a Day*: Princeton, NJ: Princeton University Press.
- Cross, N. (2007). Forty years of design research. *Design Studies*, 28, 1–4.
- Drexler, A., Fischer, G. & Schoar, A. (2010). Keeping it simple: Financial literacy and rules of thumb. *CEPR Discussion Paper No. DP7994*. Retrieved 27 Jan, 2014, from <http://ssrn.com/abstract=1707884>
- Fernandes, D., Lunch Jr., J., & Netemeyer, R.G. (2014). Financial literacy, Financial education, and downstream financial behaviors. *Management Science*. Preprint Retrieved 27 Jan, 2014, from <http://dx.doi.org/10.1287/mnsc.2013.1849>
- Fry A., Wilson J., & Overby C. (2013). Teaching the design of narrative visualization for financial literacy. *Art Design & Communication in Higher Education*, 12(2), 157-175.
- Fry A., Wilson J., & Overby C. (2014). Designing financial literacy with the other 90%. Proceedings from Cumulus Johannesburg Design with the other 90%: Changing the World. Johannesburg, S.A.: Greenside Design Center.
- Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H,... Tracer, D. (2005). Economic man in cross-cultural perspective: behavioral experiments in 15 small-scale societies. *Behavioral and brain sciences*, 28, 795-855.
- Holzmann, R., Mulaj, F. & Perotti, V. (2013). Financial capability in low- and middle-income countries : Measurement and evaluation. Washington, DC: World Bank. Retrieved 27 Jan, 2014, from <https://23.21.67.251/handle/10986/16293>.
- Kahneman, D. (2003). Maps of Bounded Rationality: Psychology for Behavioral Economics. *The American Economic Review*, 93(5), 1449-1475.
- Kahneman, D. (2011). *Thinking, fast and slow*. London: Penguin.
- Klapper L. & Husnain, B. (2009). Financial Stability and Access: The Importance of Financial Literacy. [sp]. Retrieved 7 June, 2014, from, <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:22042953~pagePK:64165401~piPK:64165026~theSitePK:469382,00.html>
- Lakoff, G. & Johnson, M. (1980). *Metaphors We Live By*. Chicago, IL: University of Chicago Press.
- Lusardi, A. & Mitchell, O.S. (2011). Financial literacy around the world: an overview. *Journal of Pension Economics and Finance*, 10(4), 497-508.
- Lusardi, A. & Mitchell, O.S. (2013). The economic importance of financial literacy: theory and evidence. The National Bureau of Economic Research Working Paper no. 18952. Retrieved 20 Jan, 2014, from: <http://www.nber.org/papers/w18952>.
- Mullainathan, S. & Shleifer, A. (2005). The Market for News. *American Economic Review*, 95(4), 1031-1053.
- Rittel, H. & Webber, M. (1973). Dilemmas in a General Theory of Planning. *Policy Sciences*, (4), 155–169.

- Sanders, E. B.-N. (2006). Scaffold for Building Everyday Creativity. In J. Frascara (Ed.), *Designing Effective Communications: Creating Context for Clarity and Meaning*. New York: Allworth Press.
- Schmeiser, M.D. & Seligman, J.S. (2013). Using the right yardstick: Assessing financial literacy measures by way of financial well-being. *Journal of Consumer Affairs*, 47, 243–262. doi: 10.1111/joca.12010
- Schön, Donald, *The Reflective Practitioner: How Professions Think in Action*, Basic Books, New York. (1984)
- Schön, D. & Rein, M. (1994). *Frame Reflection: Toward the Resolution of Intractable Policy Controversies*. New York: Basic Books.
- Sleeswijk Visser, F. (2009), *Bringing the everyday life of people into design*. (Doctoral dissertation). Retrieved 7 Feb., 2015, from <http://studiolab.io.tudelft.nl/manila/gems/sleeswijkvisser/sleeswijkthesis.pdf>.
- Sleeswijk Visser, F., Stappers, P, J. & Van der Lugt. (2005). Contextmapping: experiences from practice. *CoDesign: International Journal of CoCreation in Design and the Arts*, 1(2), 119–149.
- Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behaviour and Organization*, 1, 39-60.
- Tirado, L. (2014). *Hand To Mouth: Living in Bootstrap America*. New York: Penguin.
- Vella, J (2001), *Taking Learning to Task: Creative Strategies for Teaching Adults*. New York City: NY: Jossey-Bass, Wiley.
- Xiao, J., Sorhaindo, B. & Garman, E. T. (2006). Financial behaviours of consumers in credit counselling. *International Journal of Consumer Studies*, 30(2), 108-121.
- Yoong, J. (2011). Can Behavioral Economics be used to make Financial Education more Effective?. *Improving Financial Education Efficiency: OECD-Bank of Italy Symposium on Financial Literacy*. OECD Publishing. doi:[10.1787/9789264108219-6-en](https://doi.org/10.1787/9789264108219-6-en)
- Yoong, J., Mihaly, K., Bauhoff, S., Rabinovich L. & Hung, A. (2013). A Toolkit for the evaluation of financial capability programs in low-and middle-income countries. *Financial Literacy and Education Russia Trust Fund*. Washington DC: The World Bank.