ADVANCED DESIGN THINKING

A new course to foster innovation and creative-problem solving

A proposal to the Engaged Practices Innovation (EPI) Grant Program
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ABSTRACT

"Design thinking" is a creative problem-solving methodology developed at Stanford University, which enables interdisciplinary teams to tackle complex, open-ended challenges across many different domains.[1-3] In this proposal, we aim to build on the success of the introductory course "Design Thinking and the Art of Innovation" (DT) by piloting an advanced version of the course, called "Advanced Design Thinking" (ADT). ADT is being developed as a direct response to the demand, articulated by students who have taken DT, for a further opportunity to hone their innovation skills. Encouraged by student feedback about DT, we believe that ADT can continue to employ high-impact practices of project-based learning, service learning, and collaborative research to increase student engagement and retention, while helping to prepare our students to be innovators in an ever-more-rapidly changing world and job market.

INTRODUCTION AND BACKGROUND

In recent years, curricular programs in design thinking have been established at northeastern campuses including UMASS, Dartmouth, Williams, Smith, Middlebury, Wesleyan, Amherst, Olin, and Harvard.[4,5] Meanwhile, education policy research rings ever more frequently with imperatives to incorporate design thinking at all levels of education.[6-8] At UVM, the first design thinking initiative was the three-credit interdisciplinary course "Design Thinking and the Art of Innovation" (AS 095), taught by Eugene Korsunskiy since Spring 2015 and open to all students. This course has enjoyed overwhelmingly positive student feedback, as evidenced by end-of-semester evaluations (Appendix).

In DT, students learn innovation skills that are widely applicable to different domains and content areas. These skills include conducting primary research, critical thinking and data analysis, idea generation, prototyping with physical and digital materials, managing team dynamics, and presentation/communication skills. Students work in teams on three projects, producing ideas and prototypes

that range from products to software to services (Figure 1). One of the most significant outcomes of developing these skills in a design context is students' increased confidence in their creative abilities.[9]
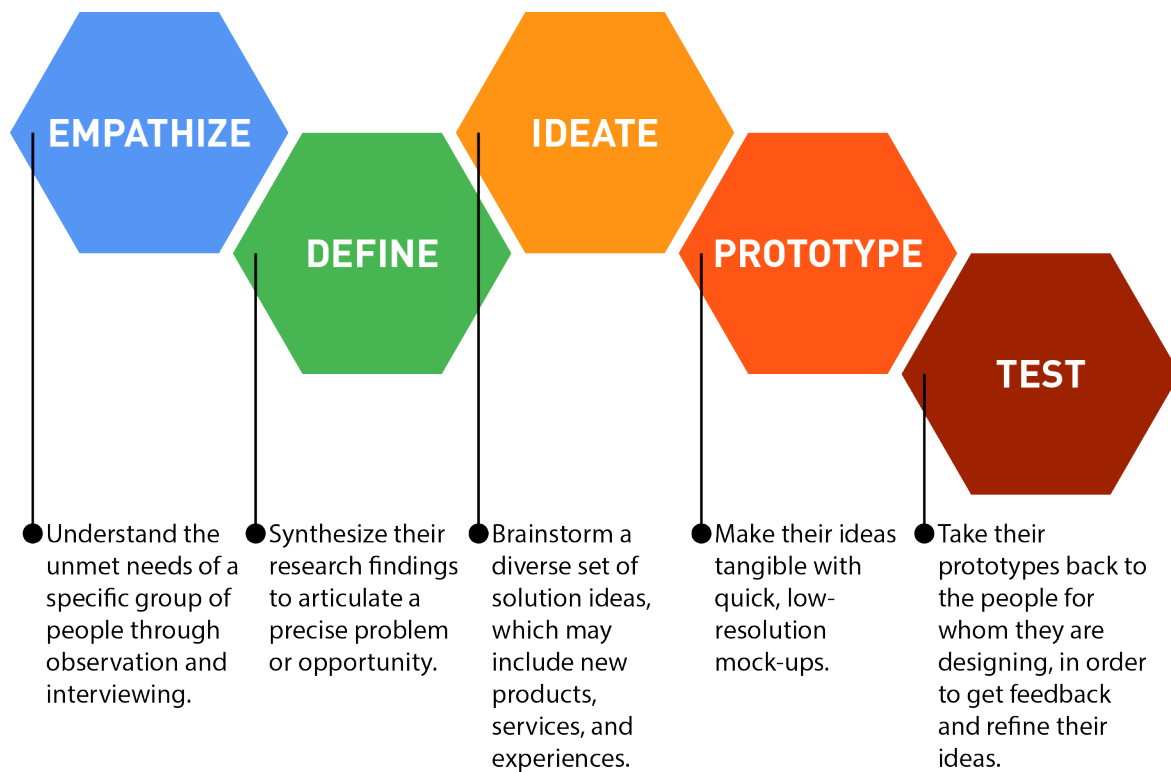

EMPATHIZE — Understand the unmet needs of a specific group of people through observation and interviewing.

DEFINE — Synthesize their research findings to articulate a precise problem or opportunity.

IDEATE — Brainstorm a diverse set of solution ideas, which may include new products, services, and experiences.

PROTOTYPE — Make their ideas tangible with quick, low-resolution mock-ups.

TEST — Take their prototypes back to the people for whom they are designing, in order to get feedback and refine their ideas.

Figure 1. What students do during the course of a design thinking project.

The projects on which students work in DT are real-world challenges assigned in collaboration with organizations like Efficiency Vermont, Burton Snowboards, Lake Champlain Chocolates, and the Flynn Center. For this reason, DT has been designated a Service Learning course, utilizing the high-impact practice of community partnerships.[10] We expect that ADT will also be designated a Service Learning course.

ADT will take the DT experience one step further: rather than working on three shorter projects assigned by the instructor, students will work on a single semester-long project of their own devising. The course will thus utilize the high-impact practice of capstone project or "culminating experience."[10] Being self-assigned, the project will increase student engagement by bolstering students' sense of agency and ownership of their educational experience.[11,12]

PROJECT DESCRIPTION

Eugene Korsunskiy will be the primary instructor of ADT. Steven Kostell and Erik Monsen will lend their subject-matter expertise to enhance student understanding of the technical and business factors of the innovation process, and will each lead two class sessions.

ADT will be divided into three phases, each corresponding to one central question of the design thinking methodology:

1) What should we make?
2) How can we make it?
3) How can we make it happen?

These questions are illustrated, respectively, by the intertwined considerations of the human, technical, and business factors integral to interdisciplinary innovation (Figure 2).
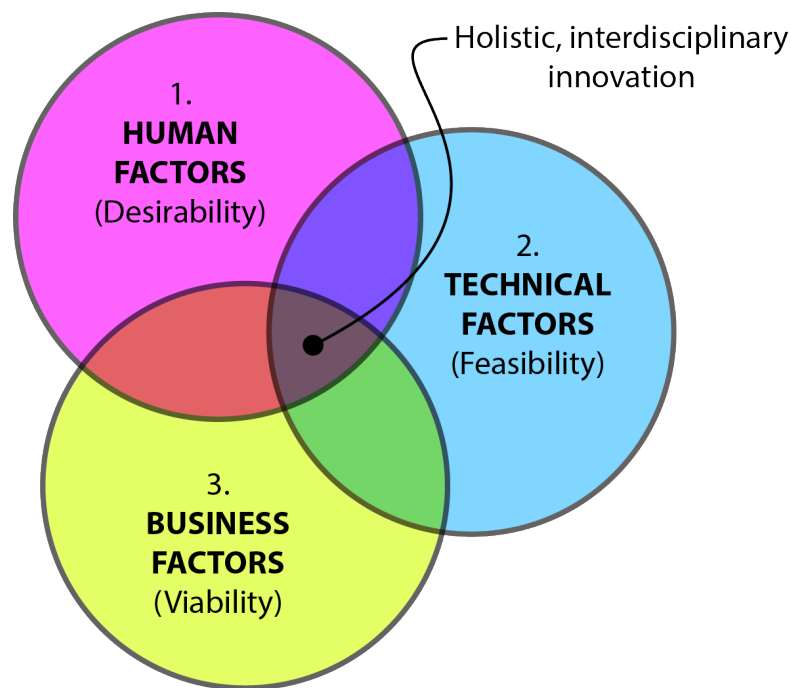

Figure 2. The design thinking approach to creative problem-solving.[13]

In the first phase (roughly one-third) of the course, students will self-group into teams and consider the first question, exploring potential project topics and conducting primary research to identify a specific issue on which to work. Eugene Korsunskiy will lead the students through this exploration.

In the second one-third of the course, students will consider the technical details of their concepts. Steven Kostell will teach several tools and techniques for hands-on design, including digital design software, as well as methods for effective brainstorming. In the final one-third of the course, students will consider the viability of their ideas. Erik Monsen will instruct the students on creating viable business models, and on other supporting entrepreneurial tools, in order to help students to ensure that their product/service meets a market need and creates sustainable value for customers and end users. The students' final deliverable will be a working prototype of their product, software, or service, which will be presented at UVM's end-of-semester Student Research Conference.

Critical to the success of a course is the physical space in which it is taught.[14] We have been working with the Office of the Vice President for Research and the Provost to create a new innovative space for student-centered teaching at UVM (Hills 20). ADT will be one of the first semester-long courses to take place in this room. Part of the requested EPI funds will go toward outfitting it with supplies and equipment needed for design work, including brainstorming and prototyping materials. In part to fulfill the cost-share requirement of this grant, the OVPR has committed and begun spending $8,550 to furnish the space per our specifications.

ADT will be a three-credit course. DT will be a prerequisite for ADT. We aim to pilot ADT with ten students; so far, nine have expressed interest in participating. In future semesters, we will set the enrollment at 20. After the Spring 2017 pilot, ADT will be improved based on our learnings and offered again each subsequent spring semester. DT and ADT will both be part of a new Design Thinking minor, currently under development in the College of Arts and Sciences.

DISCUSSION

Student feedback from DT (Appendix) reveals a high level of student engagement in this course. Research conducted at other institutions has also shown a link between design thinking and student engagement.[15,16] ADT will amplify the success of DT by allowing students to pursue a capstone-style

project of their own devising, thereby utilizing high-impact practices of project-based learning and service-learning, and enhancing them through a structure of a self-directed educational experience.

ADT fits into what Provost Rosowsky has called a growing "ecosystem of innovation" at UVM and in Burlington.[17] With the establishment of VCET and Generator in Burlington, as well as the Entrepreneurship Forum, the new innovation space in Hills, and other efforts at UVM, the University is well-positioned to become a breeding ground of the next generation of creative problem-solvers. Integral to this strategic positioning is the thoughtful combination of educational efforts at the intersection of the humanities and technology.[18] As an important part of this ecosystem and a natural inhabitant of this intersection, ADT—through its encouragement of creative thinking, collaboration, and experimentation—will help students develop skills crucial for the 21st century economy, and become empowered innovators.[19]

ASSESSMENT PLAN

Because of the structural similarities between ADT and the BioFabLab course, which Eugene Korsunskiy co-taught with Andy Mead in Spring 2016 with the support of an EPI grant, we here copy and affirm—with Dr. Mead's permission, and the substitution of "ADT" for "BioFabLab"—the "Assessment Plan" portion of the EPI grant proposal which Mead & Korsunskiy submitted in 2015:

The small size of ADT limits any quantitative assessment of efficacy in either attraction/retention, or learning efficacy. However, its size and seminar format will confer flexibility and foster student feedback. Therefore, the assessment of the course will take the form of an assessment of the process. Course instructors will hold regular meetings throughout the semester. With input from students, we will prepare a report on what we learned, on successes and failures, and what we plan to do differently in the Spring 2018 version of the course. This, together with final project materials, will be submitted as part of our final report on the project.

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BUDGET

Item	Cost-Share	EPI
Instructor Salary	**$5,717 (CAS)**	**$0**
The College of Arts and Sciences (CAS) will cover Eugene Korsunskiy's salary for teaching this course ($5,717), as well as Steven Kostell's salary for leading two sessions of the course. The Grossman School of Business (GSB) will cover the salary of Erik Monsen for his contribution to leading two class sessions.		
Equipment and Supplies	**$8,550 (OVPR)** **$300 (CUPS)**	**$10,000**
This includes ideation and prototyping tools, materials needed for prototype fabrication, and new equipment for Hills 20 to optimize the room for ADT (including additional whiteboards and similar equipment). This also includes $8,550 which the Office of the Vice President for Research (OVPR) has committed and begun spending to outfit Hills 20 for ADT and similar courses. The cost-share also includes $300 made available by the Office of Community-University Partnerships and Service Learning (CUPS) to support supplies needed by students in this Service Learning course.		

Total project cost: $24,567

Cost-share offered by CAS, CUPS, and OVPR: $14,567

Funding requested from EPI: $10,000

APPENDIX

SELECTED QUOTES FROM STUDENT EVALUATIONS OF THE INTRODUCTORY DESIGN THINKING COURSE (UNABRIDGED EVALUATIONS AVAILABLE UPON REQUEST):

In their own words, the students learned…

How to really get out of my comfort zone and out into the community.

The importance of getting ideas out of my head and into the world to see if they will work.

Real world experience is important and often more rewarding than just having ideas and doing things without putting them out in the world.

[The value of] reflection—that is where you learn the most.

To approach questions from more points of view.

That it's okay to have bad ideas, but it's important to test and try everything and take chances to figure it out.

Ideas can come from really unexpected places if you let them.

It's okay to completely rethink an idea.

How to manage different personalities in a group.

Thinking by doing—testing instead of theorizing.

Not to be self-conscious of my own ideas.

Thinking by doing & taking a more needs-based approach to problems, instead of purely intellectual.

Conceptual tools to use in any domain.

Harnessing a creative mindset in an environment that favors more unilateral thinking.

It's okay to have bad ideas! They help you find your way to good ones!

How to brainstorm & get my creative thinking going.

Work can be fun.

How to work to the strengths of a group & organize time effectively.

How to be a more productive member of a team.

I'm capable of much more than I thought I was!

In their own words, how did the students grow or benefit from the class?

I've definitely grown more confident in my ability to be creative and generate good ideas. I now see areas of my life and others that can be improved through design thinking.

My ability to work with a group has gotten better.

I've become a lot more responsible: communicate w/ group if something is wrong/going on, get my work done on time, all the time.

This class helped me realize I have the potential to create actual designs that could be implemented, and now I want to pursue it as my career!

I'm more comfortable giving presentations. Public speaking has never been my strong suit.

I am more willing to work collaboratively and have realized often the best work is done with others. I think many problems in the world could be solved through partnership and acceptance of ideas you otherwise may not come up with on your own.

I took away how to go about tackling problems and working within a group effectively.

I believe that I'm a much stronger player in group projects. I had to… really step up and speak my opinions, even when I was worried about judgment. I also feel like I am more accountable for all the work I complete due to this course.

[I have] better team skills (coordination, communication, humility).

[I have] gotten much more comfortable working in a group setting.

One way I have grown is in my creativity.

Through this class I have gotten a lot better at organizing my thoughts and steps for different tasks.

This class helped me grow my presentation skills and research skills.

[I have] more confidence in the work I make.

I've gotten much more comfortable letting go of perfectionism at the development phase in order to open myself up to new discoveries.

[I will be more] okay with making mistakes and not having everything be perfect on the first try.

This class helped introduce me to the idea of being "the change you want to see in the world."

What did the students think of the class?

This class has been an absolute pleasure, and has been, without a doubt, my favorite I've ever taken. Thank you!

This class was the most unique, creative and real-world applicable class that I have taken in my course at UVM.

This class has been really awesome! Ideas that can be applied in a lot of situations & applicable for most majors.

This class has been my favorite I've taken here.

This class is a huge contribution to UVM, more so than you may think.

Amazing class, amazing teacher. Will never forget this class. I hope to take more in future.

Please build a major on this stuff.

What did the students think of the instructor?

Eugene is an amazing professor! He is extremely organized and passionate about the material he teaches. I couldn't have asked for a better professor to run this class.

Keep doing what you're doing. This class is inspiring and you are inspiring.

Thank you so much for truly teaching us by allowing us to learn, and for simply respecting us as colleagues! You are a ray of sunshine!

Eugene, you are honestly one of the best professors and life mentors I've had during my time at UVM–your knowledge, enthusiasm, personality bring out the best in us—don't change that! We love you!

Eugene is one of the best teachers I have had yet. He is positive, organized, and always treats his students with respect.

Really awesome job inspiring me to do my best.

One of the best professors I've ever had.

LETTERS OF SUPPORT

Starting on the next page, please find letters of support for this project from:

- **WILLIAM FALLS**, Dean of the College of Arts and Sciences

- **RICHARD GALBRAITH**, Vice President for Research

- **SANJAY SHARMA**, Dean of the Grossman School of Business

The University of Vermont

September 25, 2016

Brian V. Reed
Associate Provost for Teaching and Learning
85 South Prospect Street
348 Waterman Building

Dear Associate Provost Reed,

I am writing in support of the "Advanced Design Thinking" project proposal for the Engaged Practices
Innovation (EPI) grant, being submitted by Eugene Korsunskiy, Erik Monsen, and Steven Kostell.
As student demand for design courses soars, "Advanced Design Thinking" will an integral part of the
College's plan to meet this demand. This course will be part of the new Design Thinking minor, currently
being developed under my direction in the College. I believe that "Advanced Design Thinking" course holds
tremendous promise to increase student engagement and retention.

In partial satisfaction of the cost-sharing requirement of the grant, the College of Arts and Sciences will
cover the instructional salary for Eugene Korsunskiy, instructor of record for the proposed three-credit
course, in the amount of $5,717. The College will also cover Steven Kostell's salary for his time spent
teaching several meetings of this course.

Sincerely,

William Falls
Dean

The University of Vermont

Richard A. Galbraith, MD, PhD
Vice President for Research

September 27, 2016

Brian V. Reed
Associate Provost for Teaching and Learning
85 South Prospect Street
348 Waterman Building

Brian.reed@uvm.edu

Dear Associate Provost Reed:

I am writing to express my support for the "Advanced Design Thinking" project being proposed for an Engaged Practices Innovation (EPI) Grant by Eugene Korsunskiy, Erik Monsen and Steven Kostell.

"Advanced Design Thinking" will be an important part of enhancing the ecosystem of innovation and entrepreneurship on campus, because it will provide an organized and supported venue in which students will be encouraged to initiate entrepreneurial projects.

In part to satisfy the cost-sharing requirements of the EPI grant, I have committed and already begun spending $8,550 to outfit the new innovation classroom, located in Hills 20, in which "Advanced Design Thinking" will be taught. I believe that the design and entrepreneurship movement of which "Advanced Design Thinking" is a leading part will significantly increase student engagement at UVM.

Sincerely,

Richard A. Galbraith, MD, PhD

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September 27, 2016

Brian V. Reed, Associate Provost for Teaching and Learning
85 South Prospect Street
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Dear Associate Provost Reed,

I am writing in support of the "Advanced Design Thinking" proposal for the Engaged Practices Innovation (EPI) grant, being submitted by Eugene Korsunskiy, Erik Monsen, and Steven Kostell.

I believe that "Advanced Design Thinking" can lead to increased student engagement due to its project-based structure and its emphasis on community-involved learning and real-world application of student work. Design education like that embodied by this course helps to train our students to be successful innovators and entrepreneurs.

Erik Monsen will be involved in course development and will lead two class sessions during the semester. In partial satisfaction of the cost-sharing requirement of the EPI grant, the Grossman School of Business will cover Prof. Monsen's salary for his time spent teaching two meetings of this course.

Sincerely,

Sanjay Sharma, Ph.D
Dean, Grossman School of Business