Module 1

INTRODUCTION

A shared vocabulary is essential for effective communication. So, we must begin our journey by exploring the rationale for this book and defining several pivotal terms.

RATIONALE

Why Read This Book?

The reason to read this book is simple: it can help you develop ideas, solve problems, and pursue innovation. Ideation (the development of concepts) helps us to expand and refine our initial ideas. Implementation (the process of putting a plan into effect) helps us to turn our concepts and intentions into actions. This can result in innovation: the development of an improved product, process, or service.

There are many general-audience books that emphasize connections between ideation and innovation, but none offers the interdisciplinary and hands-on approach most beginners need. This workbook is designed to fill that gap. It is especially aimed at college undergraduates, yet it is sufficiently self-explanatory to be used by highly motivated readers outside of a classroom.

Perhaps you don't consider yourself to be a creative person, and you aren't sure you can develop new ideas. If so, you've been selling yourself short. Humans are naturally creative! Taking it step by step, you can discover unexpected abilities and realize hidden potential. Even if the exercises are unlike anything you have done before, they can help you expand your thinking and enrich your life.

What Are the Main Characteristics of Creativity?

Creativity provides us with the capacity to identify hidden possibilities in any situation and develop new connections. Rather than passively accept things as they are, the most creative people seek improvements and devise alternative courses of action. Whether they are composing music, inventing a new product, developing a business, or engaging in scientific research, the most creative people seem to see the world afresh every day.

Why Is Creativity Important?

Creativity drives scientific breakthroughs, sparks innovations in every conceivable field, and inspires social change. As a result, more and more businesses and nonprofits list creativity as one of their primary strengths. In response, coursework in entrepreneurship, innovation, creative inquiry, and design thinking is rapidly being added to curricula in universities and colleges worldwide.

How Does the Creative Process Work?

As shown in figure 1, creativity tends to shift from empathy, definition, and ideation to prototyping, testing, and critique. As we work our way forward, new opportunities as well as new obstacles appear. We often have to circle back to expand on an earlier step. Prototyping and testing are especially important. These steps turn abstract ideas into tangible objects and actions that can lead to crucial revisions.
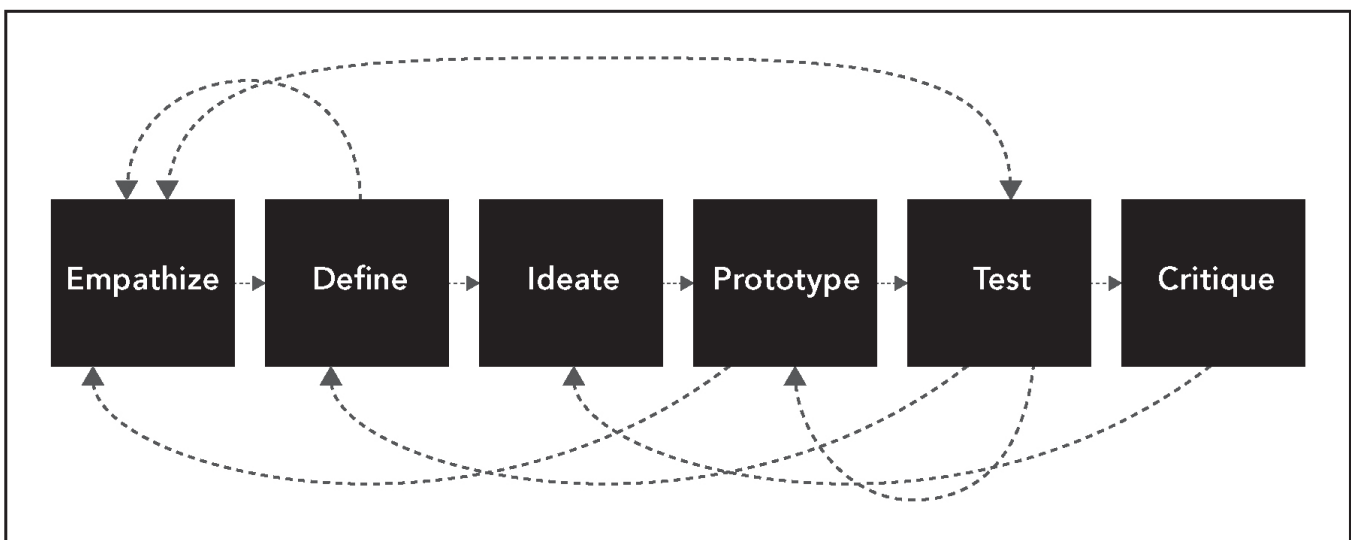

Figure 1. Design process. Forward movement is often interrupted by both setbacks and new insights. Source: Rachel Perrine and Mary Stewart.

In recognition of this one-step-forward-and-one-step-backward process, three premises will be reinforced throughout this book:

- The more ideas that we develop, the greater our chances of finding a great solution.

- By focusing on the most promising of our initial ideas and then developing them, we can avoid squandering time, money, and energy.

- A great idea never saved a bad solution. Even the cleverest idea is worthless if it doesn't really solve the problem.

What Is Creative Inquiry?

Creative inquiry is a problem-solving process that combines a wide range of ideation strategies with targeted research and purposeful critical thinking. Because creative inquiry emphasizes the development of compelling questions as well as the presentation of convincing answers, it encourages exploration, risk-taking, and independent thinking.

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Creative inquiry began as a premise, has evolved into a collaborative teaching and learning process, and is now stimulating wider exploration of ideas and their implications across many disciplines. More volatile than traditional university coursework, it can take many different forms, depending on the teacher, the students, and the institutional context. In all cases, though, creative and critical thinking work together to advance viable solutions to significant problems.

Why Complete the Exercises in This Book?

Creative inquiry requires personal initiative and is best developed through active learning. The readings in this book make a lot more sense when they are connected to the exercises. This calls to mind an old proverb: "I hear, and I forget; I see, and I remember; I do, and I understand." By doing the exercises, you can apply the book's content to your own life.

ORGANIZATION

What Are the Eight Modules?

Creative Inquiry: From Ideation to Implementation is organized into eight modules. This introduction provides the rationale for this book, its orga-

nization, and its essential terminology. In module 2, three short warm-up exercises provide a lively introduction to the hands-on working method we will use. In module 3, the ideas you develop through these exercises are expanded through four creative challenges. In this section, we will focus on understanding user needs, incremental and transformative change, the importance of clear problem definition, and the value of targeted research. An extensive discussion of idea-generation strategies (module 4) and idea-selection strategies (module 5) follows. Creativity requires exuberant ideation; implementation requires careful selection and practical action. Because both are so important, modules 4 and 5 are especially robust. Their exercises set the stage for module 6: a capstone project. This project gives you a chance to define a problem of personal significance and then to design a solution. Module 7 consists of seven interviews called innovator insights. These can help you understand the ideas that have inspired innovations and the obstacles that entrepreneurs have overcome. The concluding eighth module includes a special section on internships, which provides practical advice to readers seeking hands-on experience and a potential career springboard. This book ends with practical advice on writing, a glossary, and examples of further resources.

Whose Stories Will Be Told?

The interviews focus on the achievements of inventive people who have done extraordinary things. In this book, you will meet

- an entrepreneurship mentor who has helped to redesign numerous Canadian businesses,

- a scientist and educator who emphasizes problem solving in his teaching,

- a biomedical engineer whose inventions transform patients' lives,

- an engineering project manager and writer who uses creativity in both disciplines,

- an interior designer committed to improving housing for homeless populations,

- an independent filmmaker whose projects publicize social problems and solutions, and

- an entrepreneur who is working to connect leadership, education, and community in Puerto Rico.

Each interview ends with engaging and encouraging down-to-earth advice.

What Strategies Will You Learn?

Upon successful completion of the exercises in this book, you should be able to

- use research as an essential aspect of innovation,

- identify connections between creative and critical thinking,

- develop and utilize multiple ideation techniques,

- improve an initial idea through multiple iterations,

- clearly identify and overcome obstacles, and

- begin to connect your coursework to your career.

How Can You Apply These Skills?

Truly creative people develop a strong capacity for thinking outside the box. To increase your self-motivation and encourage independent thinking, all of the exercises in this book are designed to help you develop the skills you need to pursue a self-designed project that is personally significant. As a preview, a concise outline for this project follows. The expanded description begins on page 56.

By understanding the overall direction of this book, you can begin collecting ideas and identifying resources at any time. Being on the lookout for potential mentors or collaborators is especially important. Someone almost certainly knows more than you about the research you plan to pursue. Talking with that person can help you focus and move forward. Maintaining a small notebook with your ideas and potential resources will help you keep your notes organized and active.

CONCISE CAPSTONE PROJECT OUTLINE

Title: Give your project a descriptive and memorable title. You want it to stand out, and the title itself can help define your intentions.

Investigator(s): Who will complete the work—a single person or a team?

Problem Description: What will you do?

Significance: Why is it important?

Audience and Users: Who will gain from the result?

Potential Supporters: Students are surrounded by helpful people, including instructors, other students, advisors, and possibly a college leadership center or technical assistants in a lab. Successful entrepreneurs seek out venture capitalists and value their advice as much as their money. What might any (or all) of these folks contribute to your project?

Targeted Research Questions: What more do you need to know about this problem in order to reach an effective solution?

Research Resources: What books, videos, workshops, websites, or other resources can help you solve your problem?

Ideation and Selection Strategies to Use: You will develop ideation strategies through the exercises in this book. Which ones are most likely to be helpful here?

Potential Obstacles: What obstacles do you anticipate upfront?

Criteria for Success: In your mind, what would constitute success?

Projected Timetable: What do you plan to accomplish each week?

TERMINOLOGY

What Terminology Will We Use?

For clarity, let's now define a few key words that inform the subtitle, *From Ideation to Implementation*. (Boldfaced terms are also included in the glossary.)

DEFINING IDEATION

ideation
the process of developing ideas and forming concepts

Ideation can be defined as the process of developing ideas and forming concepts. Three main words in our ideation definition are also significant. So, let's consider definitions for *process, concept,* and *form,* and why they are important.

UNDERSTANDING PROCESS

Process can be defined as a series of actions taken in order to achieve a particular end. Through a creative process, we can develop both our ideas and ourselves over time.

Why Is This Important?

Great ideas rarely burst forth clearly defined and fully formed. In fact, the more innovative the idea, the rougher it may be, at least initially. If no one has ever tried the amazing approach you propose, you will probably have to make a lot of mistakes before determining the best way forward. As a result, our ideas typically evolve through a series of versions known as **iterations.** Ideally, each iteration improves on the previous one until a satisfactory solution finally emerges.

This book is based on the premise that creativity is a human characteristic that anyone can cultivate through sustained effort. As a result, the self-reflections offered at the end of each major block of work encourage you to revisit and revise your initial ideas. Forget about the quick fix or simple talent. Both our creativity and our ideas tend to develop through iteration rather than through wishful thinking.

DESCRIBING CONCEPT

Concept (our next ideation key word) is complex and requires more explanation. Concepts tend to be broader and more abstract than ideas. For example, "When it comes to food, everyone should be self-sufficient" is a concept. "Let's grow a garden this summer" is an idea.

A concept may seem simple at first. For example, the basic concept behind the cell phone is this: in communication, mobility is an advantage. Because old-fashioned phones were anchored to buildings, the user had to go *to* the phone in order to make a call. Today, every user carries a cell phone. As we now know, this enables constant communication and offers all sorts of everyday uses, from GPS to social media and beyond. The mass-marketed cell phone now seems inevitable—but it was revolutionary when introduced in 2007.

Because concepts tend to be broad and abstract, they invite extensive investigation. *Time* is an example. We may begin at a basic level, with simple distinctions among past, present, and future events: "We went to the grocery store, we are buying four apples, and we will eat the apples tomorrow." Things get more complicated as soon as we add memory of the past and plans for the future: "As we ate the apples, we remembered

the time we picked fruit at my uncle's farm. Let's do that again next summer." Time becomes more complex still when we consider ways in which it can compress or expand depending on context. For example, two hours at a dentist's office may seem endless, while two hours watching a well-edited movie just fly by. And for a physicist, historian, epidemiologist, or paleontologist, time becomes even more meaningful and complex. In all cases, though, the concept of *time* drives our investigation, whether we tackle it at a very practical or more theoretical level.

DEVELOPING FORM

Form, the final component in our definition of *ideation,* creates a bridge between the words *process* and *concept*. Form can be defined as the tangible manifestation of an idea. An architectural idea takes form when a building is constructed; a political idea takes form when a campaign is launched or a law is passed; a cake is formed when flour, eggs, and other ingredients are combined and baked. Through form, our concepts shift from general intentions into tangible objects and actions.

DEFINING IMPLEMENTATION

implementation
the process of putting a plan into effect

This leads us to *implementation*, the last word in the book's subtitle. As noted at the beginning, **implementation** can be defined as the process of putting a plan into effect. Because truly innovative concepts are very difficult to implement, having a great idea is only half the battle. Implementation requires just as much skill as ideation does—and usually, a lot more fortitude and money! As a result, various aspects of implementation are discussed throughout this book:

- understanding user needs

- defining problems clearly to produce effective results

- researching existing solutions and understanding their strengths and weaknesses

- selecting the most promising option from a range of possibilities

- identifying hidden potential and overcoming obstacles

The ideation strategies in this book can be applied to any discipline. However, the actions we take and the obstacles we encounter become more discipline specific when we move toward implementation. To provide

examples of creativity in various disciplines, the interviews starting on page 75 offer personal stories from very different perspectives.

What Is the Role of Design Thinking?

Many of the exercises in this book are inspired by **design thinking**, a sequence of practices that helps people innovate effectively, especially in business. This methodology combines empathy, logic, imagination, intuition, and systematic reasoning to explore a wide range of possibilities and then develop the best to produce something new.

As a broadly based entry-level book, *Creative Inquiry* references design thinking practices while remaining readily accessible to all readers. Regardless of our disciplines, we can all benefit from a greater capacity for ideation and a deeper understanding of implementation. Those seeking degrees in engineering, design, or business often expand on this introduction through more extensive coursework in design thinking, management, systems design, and human-centered design.