

Do we innovate as we believe we do?

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Abstract

Purpose – This research study assessed the mindset of individuals regarding their perception of innovation as a means for successful product or process improvement and their perception of thought processes that underpin innovative practices. It investigated the attitudinal foundation for the development of training, development and assessment of structured innovation methodologies.

Design/methodology/approach – A combination of qualitative and quantitative research gathered through an anonymous survey designed to explore the basic understanding of innovation and included open-ended questions supported more integrated perceptions of innovation in the sampled population's own experiences. The participants of the survey and research were drawn from the public, but it focused more specifically on demographic groups known for their interest in innovation, either as practitioners or teachers.

Findings – The results found, overwhelmingly, survey participants believed innovation is a skill; however, they also believed, inconsistently, that innovation itself is an unpredictable, unstructured and unsystematic process.

Practical implications – At a practical level, exploring the propensity for individuals or groups to believe defined innovation practices can be effective and that these practices can be learned, measured and improved drives the overall effectiveness of training and organizational leadership. With research, we can make training professionals aware that the mindset of potential innovators is to favor a belief in brainstorming and random success. Doing so can significantly impact the preparation of training and development programs for developing structured innovation capabilities.

Originality/value – Training a new generation of innovators, especially young children, requires care so that they internalize the right mindset and the right tool strategy to be the best innovators possible.

Keywords Innovation, Creativity, Entrepreneurship, Mindset, Brainstorming, Training, Learning

Paper type Research paper

Introduction

Why examine the innovation mindset?

Our original motivation for this research was to form the basis for training and coaching around structured innovation, especially for young children, as demonstrated often by Boyd (2015). The researchers formed a partnership leveraging their separate careers as education and engineering professionals as a means to bring their own form of innovation to the learning process.

There is a great emphasis today on creativity, innovation and entrepreneurship; however, there is little direct information or tools available to develop skills that enable a lifetime of success in these topics, beginning even at the youngest grade levels. According to the Partnership for 21st Century framework, the ability to be creative and innovative will set



apart learners from those who do not demonstrate these skills. Gilchrist (2019) described five traits that were lacking in the workplace as critical thinking, adaptability and flexibility, communication, leadership and innovation and creativity, and that this posed a global challenge. Glassman and Opengart (2016) stated “innovation and creativity are skills that organizations have indicated are critical to success and which may be lacking in college graduates” (p. 121).

International Society for Technology in Education (ISTE) standards for students include ensuring students are innovative designers. Taddei and Budhai (2017) believed, “young children become innovative designers when they have opportunities to think creatively and to solve and think through open-ended problems.” According to the (ISTE, 2017) standards, teachers should “model and nurture creativity and creative expression to communicate ideas, knowledge, or connections.” In addition, the four Cs, critical thinking, communication, collaboration and creativity (National Education Association, 2014) are the basic skills all students will need in the 21st century. According to the Association of American Colleges and Universities, students need opportunities to become innovative designers and teachers need tools to help them acquire these skills. ISTE Standards for students, Standard 4, Innovative Designer states, “students use a variety of technologies with a design process to identify and solve problems by creating new, useful or imaginative solutions.” However, Valentine *et al.* (2018) stated “explicit instruction on how students may actively enhance their creativity skills was effectively non-existent.”

As the researchers began the process of collecting quality, teachable and easily remembered innovation methods, many techniques arose. Boyd and Goldenberg (2013) discussed a structured innovation process called systematic inventive thinking, and they believed that anyone can learn these skills, even young children. Valentine *et al.* (2018) believed “if students are taught how to apply idea generation heuristics early on in their studies while they are more susceptible to being able to make use of such information, this may help to further improve their level of creativity in their later years of study.” This structured innovation process aligns closely with the ISTE Student standard for innovative designer, which states that students should “know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems” (ISTE, 2016).

Can we train innovation before we believe in the possibility for success?

As the researchers progressed in training development, it became clear that beliefs toward innovation practices were key to allowing learners, even young ones, to internalize innovation best practices. Innovation is process-oriented and not a blue-sky or brainstorming activity (Thota and Munir, 2011). During training development, it became clear that as part of the challenge to building training for structured innovation we needed to first understand the receptiveness of individuals to the idea of applying any systematic method of innovation to a problem set, as well as their receptiveness to the idea that applying a method could produce superior results. Hence, there were two questions that required research, as follows:

RQ1. Do individuals believe innovation is a skill that can be learned and applied systematically?

RQ2. Do individuals see applying specific practices of innovation as better than random?

Thus, our research study examined the perceptions of individuals who may benefit from the ideas associated with innovation or with a structured innovation process. This led the researchers to want to explore the mindset across a range of demographic groups, including groups that are classically characterized as being at the forefront of innovation, such as engineering or professional organizations. As such, our research examined participants’

perceptions toward their views of innovation and of the key tenets used in the use of a structured innovation tool.

As stated, the specific purpose of this research analysis is to assess the mindset of individuals regarding their perception of innovation and innovative thinking processes, with the goal of establishing the basis for the development of training, development, and assessment of structured innovation methodologies. As a general framework, [Figure 1](#) presents the interrelations between the definition of a skill and its implications within a belief structure surrounding innovation methodologies. This research explores the mindset that separates belief in researched practices from belief in random success.

Background

In exploring the subject of a mindset toward innovation as a skill, we need to build a foundation for study that includes a modest definition of mindset and of a skill.

Is a definition of innovation needed?

This is an obvious question, and there are many definitions of innovation; however, whether it is defined is not the concern of this research. Whether perceived as creating something new, something better or just modifying something; innovation can happen in a wide range of circumstances. That individuals wish to employ some form of innovation toward a goal of improvement is all that is needed to enter a discussion of the mindset toward innovation as a skill and a discussion of the motivations for wanting to practice the skill and the methods well.

What are innovation methods?

Here again, there are dedicated books and large repositories of methods for innovation, mostly unconstrained by resources, time or money. The researchers are familiar with many such methods; however, what has been the motivation behind the research is to differentiate between innovation via random, so-called “brainstorming”, processes and more structured, methodical and measurable processes. Indeed, central to the concept of applying a process approach to innovation is the question of whether creativity and innovation are innate or learned abilities. It is a strong point by [Dyer et al. \(2011\)](#) that “Nurture trumps nature as far as creativity goes” (p.22). However, further research is needed to assess whether this is a widely held belief.

[Blank and Newell \(2017\)](#) described the importance of innovation as a process and the importance of not relying on “unconstrained activities with no discipline” (p. 1). The focus on structured innovation methods is based on the recognition that without constraints in resources, real innovation is limited to comparably few major techniques ([Boyd and Goldenberg, 2013](#)).

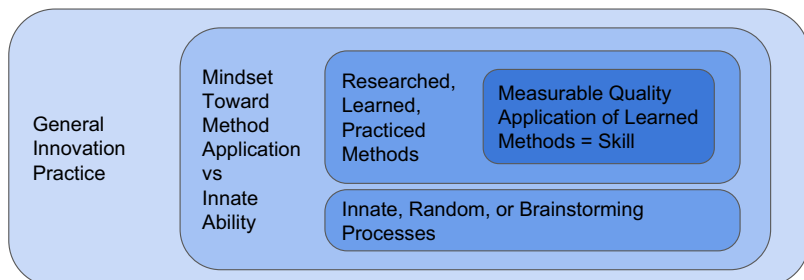


Figure 1.
Interrelationships
within the innovation
mindset

Furthermore, any methods that rely on random generation of ideas have been shown to be less likely to produce workable solutions (Boyd and Goldenberg, 2013; Rietzschel *et al.*, 2014). Although previous research suggests that idea quantity correlates strongly with the number of good ideas generated, quantity has been found to be unrelated to the quality of selected ideas (Rietzschel *et al.*, 2014).

The simple ideas that there are limited numbers of productive innovation methods and that there are more efficient methods for producing workable solutions are clearly important, but the relevance of these ideas is only important after innovators believe and thus internalize a mindset that innovation is a skill that can be learned, taught and measured for efficiency and effectiveness, like so many other skills.

Defining mindset

Paxton and Van Stralen (2015) defined mindset as:

...the confluence of our beliefs, feelings, values and attitudes, which guide our decisions, behavior and actions in the world. It is precisely the deep-seated dependence we have on our mindsets, which can open or close the possibilities we see in life and work, that make transformation so difficult (p. 13).

It is the belief that innovation can be learned that is at the heart of our definition for an innovation mindset, and this belief has been elaborated on extensively by Kuczmariski (1998), who defined the innovation mindset as follows:

- (1) Considering innovation as creative problem-solving, not blue-sky ideas and brainstorming.
- (2) Having a well-defined new product development (NPD) process.
- (3) Beginning the NPD process with front-end “problem identification” and “need intensity” research.
- (4) Using multifunctional teams with dedicated team members.
- (5) Developing compensation incentives to simulate an entrepreneurial environment.

We want to emphasize the first two elements because the remainder is focused on the implementation of an innovation practice. Entering that practice requires adopting the first two basic beliefs: innovation is not a random, brainstorming activity and innovation follows a process, and by simple extension, a process that can be documented, taught, learned and measured.

Defining skill

Innovation is a skill that can be taught, and it is not limited to one discipline but can be applicable to all disciplines (Glassman and Opengart, 2016). Other experts believed “most people can become more creative and innovative—given the right environment and opportunities” (Wagner, 2012, p. 16). Wagner (2012) described a successful innovator as possessing skills that include “curiosity, collaboration, associative or integrative thinking, and the ability to experiment and take risks” (p. 16). When individuals are able to apply associative thinking, they can “discover new directions by making connections across seemingly unrelated questions, problems, or ideas” (Kapasi and Davis, 2017, p. 41). Learning from other industries and how they innovate is one way to innovate faster (Kapasi and Davis, 2017).

The researchers’ working definition of a skill is as a human ability that is learned versus innate, teachable, measurable and that uses any form of tool, process or technique within human ability or resource limitations. A skill can be studied independent of the person

performing it and can be evaluated for improvements in technique, resource utilization or timeliness. This definition affords the means to recognize survey responses that reflect the application of a skill. By this definition, a practice of innovation that relies on luck or random success cannot be a skill.

Gale (2017) stated “building this skillset requires training, mentoring and real-world experiences that together teach employees how to figure out what customers want, and then think strategically about how to give it to them” (p. 32). Figuring out what customers want and then acting strategically are both elements of the innovation skillset.

Contrary to the belief in an innovation skill and process set, brainstorming along with “out of the box” thinking has been encouraged as a way to lead to new innovations with results that may provide “a flurry of ideas that, while appealing, are just too far out, given the company’s brand image or capabilities” (Mazursky *et al.*, 2014, p. 1). However, by our working definition, brainstorming is not a skill. Working from known solutions toward new, creative options increases the probability of success (Boyd and Goldenberg, 2013). While unexplained (i.e. random) successes do occur, relying on them is unpredictable and resource intensive (Rietzschel *et al.*, 2014).

A reliance on brainstorming, which focuses on generating many ideas quickly, has been shown to lack effectiveness in generating quality ideas (Rietzschel *et al.*, 2014). It also presumes that there are no systematic methods for rapidly generating quality ideas. Indeed, application of systematic processes for creativity and innovation has been shown to increase the probability of success in identifying suitable solutions to problems (Rietzschel *et al.*, 2014). Accordingly, Rietzschel *et al.* (2014) stressed the importance of using narrow boundaries to lead to more effective brainstorming. We are more likely to find a workable, novel solution to a problem if we first generate many possible solutions and only then evaluate their potential against the constraints imposed or goals defined by the problem statement (Rietzschel *et al.*, 2014).

Our hope is that by exposing the true beliefs and mindsets of potential innovators and specifically the disconnect between beliefs and actions, we will generate a pathway for changing mindsets and thus improve methods for better training and ultimate internalization of innovation practices. As noted by Baas *et al.* (2015) as follows:

Lay beliefs not only pertain to what creativity is and which personality characteristics may be conducive to creative achievements, but may pertain also to the processes, mind states, and circumstances that facilitate or inhibit creative thinking. However, and despite abundant research, we know little about lay persons’ beliefs about these processes, mind states, and circumstances that are conducive to creativity. (p. 340)

Methodology

The researchers used a survey developed by Boyd and Goldenberg (2013) wherein certain beliefs and expectations around a structured innovation method were explored. Contained within that survey were questions that asked broader questions regarding the general mindset toward innovation. It was these questions that are the focus of our initial research because they provided insight into the potential challenges of teaching any method for innovation, structured or otherwise.

This survey was structured as a binary system of responses which elicited clear preferences and allowed for the strongest conclusions in evaluating the results. The anticipated number of respondents was expected to provide sufficient data points to observe spreads of opinion and to mitigate the use of a Likert or other variable scale approaches.

The subjects of the survey and research were drawn from the public, but it focused more specifically on demographic groups ranging from educators and administrators, through individual businesses, public organizations, as well as business groups, community groups

and professional organizations interested in innovation. The anonymous survey was shared via social media and also through professional discussion boards geared towards these types of interest groups.

Wienclaw (2019) described survey research as having “the advantage of allowing the researcher to collect information on non-tangible constructs, such as feelings, attitudes, and opinions, that are difficult to collect directly” (p. 1). In addition, collecting both qualitative and quantitative data allows researchers to “better understand and describe human behavior” (Wienclaw, 2019, p. 1).

Findings

The participants were asked to complete the survey to collect their perceptions of a structured innovation process. (Appendix A). There were 122 responses to this survey.

The survey respondents had varied years of experience in their field with over 36 percent having more than 20 years and 30 percent with less than 10 years of experience. This reflects a broad range of experience levels. When asked, “Your role in innovation for your organization,” more than 38 percent reported playing a strategic role in leading, planning and organizing innovation projects with the remainder of the participants reporting playing a participating role in innovation. The survey consisted of 15 binary questions asking for respondents to choose the statement they agreed with most, three demographic questions and two open-ended responses to gather qualitative data on their thoughts on innovation strategy and stories of innovation. The 15 binary questions were categorized and coded, indicating which of the two responses were indicative of a structured innovation mindset vs an unstructured innovation mindset.

Key survey questions

For this paper, we will focus on the following key questions (questions 5, 6, 7, 8, 11,14) as indicative of a mindset around structured innovation and innovation practice. Each question was structured as an indicator of a favorable or unfavorable belief toward some aspect of innovation or innovation practice –the innovation mindset. Table I presents the responses that are aligned to favorable viewpoints toward a structured innovation mindset. Each question was given a shorthand label to identify the key concepts in that particular question.

[For reference, the remaining questions in the survey address attitudes toward specific practices related to structured innovation and are not the specific focus of this paper.]

In Table II, the percentages reflect the participants who chose the response that was aligned with a structured innovation mindset. What is most apparent is the difference between the responses to the skill vs gift question, question 7 and the remaining questions. Fully 75 percent of respondents believe innovation is a skill that can be learned, yet when queried about the elements of such a skill (questions 5, 6, 8, 11, 14 and 15) and of their own approach to innovation, their responses indicate that there is little, if any, skill or planning involved.

Innovation as a skill

The researcher's regard question 7, skill vs gift, as a summative query regarding the general beliefs around innovation as a skill. As previously noted, 75 percent of respondents believed that innovation is a skill that can be learned. The remaining questions all addressed sub-elements of what might be defined as a skill. In other words, a skill is made up of the elements identified in these remaining questions.

It is easy to see that responses to these other questions (questions 5, 6, 8, 11, 14 and 15) all fall below 50 percent, with most falling at or below 27 percent in favorability toward seeing innovation as a skill.

Number	Question text	Shorthand label	Response favorable to a structured innovation mindset
5.	A. When I innovate, I “brainstorm” ideas out of my head B. When I innovate, I follow a series of steps to find ideas	Process vs Brainstorm	B
6.	A. Innovating is predictable and not risky B. Innovating is unpredictable and risky	Predictable vs Unpredictable	A
7.	A. The ability to innovate is a gift that you are born with B. The ability to innovate is a skill that you can learn	Skill vs Gift	B
8.	A. I prefer ambiguity when pondering new ideas B. I prefer clarity when pondering new ideas	Clarity vs Ambiguity	A
11.	A. Innovating is a random, improvisational, back-and-forth experience B. Innovating is a systematic, linear experience	Systematic vs Random	B
14.	A. Innovation can be scheduled. It can occur anytime I want B. Innovation cannot be scheduled. It occurs randomly	Scheduled vs Unscheduled	A
15.	A. Innovation is an unstructured process B. Innovation is a patterned, “template” process	Structured vs Unstructured	B

Table I.
Key survey questions

Question	Short title	Favor	Oppose	% favorable
5	Process vs Brainstorm	31	91	25
6	Predictable vs Unpredictable	19	103	16
7	Skill vs Gift	92	30	75
8	Clarity vs Ambiguity	51	71	42
11	Systematic vs Random	33	89	27
14	Scheduled vs Unscheduled	44	78	36
15	Structured vs Unstructured	26	96	21

Table II.
Survey results for key questions (*n* = 122)

Considering that the target group of respondents was predominantly made up of individuals within learning and professional/technical career avenues, one might expect that beliefs regarding elements of a skill and belief in a skill should be more consistent; however, this is not the case, as shown in the data.

In response to question 11, systematic vs random, 27 percent of respondents favored a systematic approach to innovation. Additional comments indicating a belief in “randomness” or “luck” in innovation practice include the following:

It was random and accepted at top levels because it was a culture that appreciated new ideas.

One participant shared the importance of collaboration and risk-taking as part of the innovation process:

I'm a strong believer in collaboration, risk taking and always looking for a problem to solve or better way to do something. Ideas should be fluid to evolve and breaks need to be taken to digest what has happened. These are the reasons I like working in academia and not much else.

Likewise, another respondent reiterated: "Working with [a] group of open and creative people is the best way for me to develop new things."

Providing opportunities for individuals to work together was stressed in this participant's comment:

Allow creativity, enable people to work together (make sure they are given the time) and let them know generic problems to be solved with the basic frameworks. Let them make a run at it and give them a chance to share the best ideas with executive leadership. You never know. There just may be a diamond in the rough.

One participant responded: "Creativity is also a skill that can be learned, and innovation is often the product of creative thinking." Another person stated: "It is a mindset that can be acquired."

These findings are striking and explain why teaching any type of innovation methodology can be difficult, at best. If we define a "skill" as something that can be taught, structured and measured, then believing innovation practices are a skill should presuppose a belief that innovation can be structured and is predictable. Why there is such a clear disconnect is the subject of further research and study.

Innovation as a structured process

The researchers focused specifically on questions 5, 6, 11, 14 and 15 as indicators of a belief in innovation as a structured process. The aggregate of these responses clearly demonstrated that respondents believed innovation is an unstructured, random, unpredictable and unplannable process. In question 5, process vs brainstorm, 25 percent believed that innovation follows a series of steps and processes when gathering ideas. In question 6, predictable vs unpredictable, only 16 percent responded that innovation was predictable. When asked if innovation followed a linear process, in question 11, systematic vs random, 27 percent of respondents believed this to be true. In question 14, scheduled vs unscheduled, 36 percent of respondents believed innovation to be structured and not random. In question 15, structured vs unstructured, 21 percent of respondents chose innovation as a patterned/templated process.

One respondent described innovation as a "brilliant flash of the obvious" – an elegant solution to a complex problem or a creative idea that you cannot believe no one thought of before. While another respondent described innovation structure as something that comes after an unstructured process:

I find that openness and flow are critical to innovation, meaning that one must let go of the "norm" and allow the creative process to flow through them. It requires a letting go of what is and even what "could be" to allow Whatever to come through. Whenever I have revised a part of a course, part of my home or even part of my life it has never come from my structured, linear, "comfortable" thinking; instead it has arisen out of necessity and openness. The structure then comes with the trial/error period that resulted in that innovative thinking and then the actual execution of it.

Additional comments indicating a belief in "randomness" or "luck" in innovation practice include the following: "Employers strategy: keep time for employees for free brainstorming. No forcing—that's left to intuition."

We asked participants to share any thoughts on innovation strategy. One participant provided the following in-depth analysis of lessons learned:

1) Understand the problem very well before creating a solution. 2) Technology for technology's sake usually leads to failure. The technology must solve a business problem. 3) Changes in the product at

the beginning are cheap, and costly later in the development. 4) Trust the people who sell to your customers, as they'll tell you what the customers want, sometimes more clearly than the customers can, and they understand your competition, too. 5) Innovative products can usually attract interest, but if not, a good solution will not achieve lasting success. 6) Don't throw good money after bad (as we saw with the founder "improving" a product that nobody wanted). 7) Make sure the market is big enough to justify the product. . . . 8) Founders need to be steadfast but can be deaf to the truth heard from the marketplace. The more you realize you do not know everything the better the solutions you create. 9) The devil is in the details. It's the non-intuitive part of the real world that will determine a product's success or failure. People are often the biggest and least-predictable variable.

One participant stressed the importance of organizations promoting the innovation process:

Organizations must promote innovation and be nimble in embracing productive change, engaging in positive risk-taking. Yet, too often, the "tried and true" approach is immutable, because of fear of new expenditures. So, they employ a pound foolish and penny-wise approach. But the old adage of "it takes money to make money" invariably holds true. As does, "nothing ventured, nothing gained." Leadership scholars Jim Kouzes and Barry Posner argue that is ultimately a self-defeating strategy. They insist that innovation, and empowering employees, is the key to success, by encouraging new research, on new markets, and implementing new, efficient and effective strategies to keep pace with, and surpass, competitors in a crowded field.

Multiple participants mentioned the importance of problem-solving related to customer needs as motivation and strategy to innovate. For example, one participant stated: "Successful innovation often comes from a detailed understanding of the customer's needs. Of course, some are solutions to unknown needs; smart phones." Another participant stated, ". . . we would innovate by working closely with our customers, understanding their day to day problems and working with them to find solutions." The need to adapt to customer's needs was captured in this quote: "We figured out what mattered to each audience and changed the program." The participant responses described innovation as driven by problems they faced and then by choices they needed to make. For example, this participant stated, "For any given problem, if there is more than one path to a solution, take a few steps for each possibility, and once the best approach becomes apparent, follow it to completion." These responses demonstrated a skillset which included finding out what the customer needed and acting strategically to address their needs (Gale, 2017).

These innovation strategies are often seen as the results of "brainstorming" processes; however, they are elements of an innovation skill. Again, as reflected on by Gale (2017), figuring out what customers want and then acting strategically are both elements of the innovation skillset, and discussion of them necessarily implies an understanding of innovation as a skill. As such, research into the nature of a problem or the constraints of valid solutions represents a bonafide process step that should be recognized as the foundation for innovation skill development.

Mixed responses, indicative of beliefs in both a random and a structured innovation practice, were evident, as well. For example, one participant stated, "It comes from detailed analysis of a problem, which could be done by committee, but I find happens personally, mainly when in the bath or shaving!" Another participant believed "Innovation can either be templated and structured or can happen randomly at any point in time in my opinion." This participant response also illustrated the belief in a combination approach to innovation as follows:

Innovation may be as simple as using a known product in a different manner, or as complicated as devising methods and equipment to get to the moon. Neither instance relies on a random or highly processed approach, but a combination of both. It is dependent on leadership to recognize both, identify personnel who work in either of those approaches, and combine and encourage them to obtain optimum results.

Multiple comments carried the hallmark phrases (“blinding flash”, “flow”, “intuition”, “letting go”, “openness”, etc.) that surround innovation and creativity which includes many tales and folklore around the creative process but believe the truth behind most successful innovation efforts, which are most often focused, deliberate, measured and fact-based efforts leading to successful solutions. [Baas et al. \(2015\)](#) clearly corroborated this finding by stating “. . .people may overestimate the likelihood of creative ideas coming in a flash of insight and may underestimate the likelihood of creative ideas coming from deliberate and focused work. (p. 343)”

Conclusions

The increasing number of global challenges (e.g. in energy, resources and information) requires a new type and quality of creativity to address and solve problems, as well as a need to systematically build a new generation of diverse, multi-skilled innovators able to employ and share problem-solving skills and experiences across their lifetime. Training a new generation of innovators, especially young children, requires care so that they internalize the right mindset and the right tool strategy to be the best innovators possible. To do so, the researchers need to understand the mindset toward and receptiveness to key ideas around innovation strategies. We began with a survey of individuals who are already involved in or educators of innovation best practices.

Our principal questions were as follows:

RQ1. Do individuals believe innovation is a skill that can be learned and applied systematically?

RQ2. Do individuals see applying specific practices of innovation as better than random?

This survey was not an exhaustive, broad demographic assessment, but it targeted individuals whom the researchers believed had backgrounds and interests in innovation. The researchers expected highly consistent responses to the questions indicating not only an understanding of innovation but also of innovation as a practice.

On the first research question, the quantitative responses clearly showed that respondents believe innovation is a skill. On the second research question, quantitative responses showed that respondents believe innovation is essentially a random process of brainstorming and is unpredictable, non-schedulable and unstructured versus a direct, systematic, structured process that is predictable and can be planned. The second result was surprising and inconsistent if we define a skill as a set of tools and process steps that are learnable, teachable, measurable and that can be improved with practice.

The survey included an opportunity for open-ended responses to questions about innovation experiences. Contrary to their quantitative responses, textual comments suggested that respondents actually do apply process steps in their practice of innovation. The challenge will be in helping future innovators to recognize those steps as actual, structured steps in innovation.

Moving beyond the question of innovation as a skill or whether innovation follows a process, there is no perfect process to innovation. Research has been done that shows clearly that a random process of generating ideas is substantially less productive than following a structured approach ([Rietzschel et al., 2014](#)). A structured process starts with something that is already working and evolves from there by applying known transformations that have historically shown to be productive, both individually and together ([Boyd and Goldenberg, 2013](#)). Once a structured process is learned and examples of innovation are shown to be clearly derived from those structured steps, it is much easier to apply that structured process with speed and confidence so that the ideas are more likely to generate viable strategies for product or process improvement.

With the knowledge described above, following a structured process for innovation improves the likelihood of overall success (Boyd and Goldenberg, 2013; Rietzschel *et al.*, 2014). Just like so much of what we know, the innovation process has been researched and the steps and guidelines have been documented (Glassman and Opengart, 2016; Boyd and Goldenberg, 2013). This means we can teach it like any other skill, and we do not have to rely on random innate abilities (Dyer *et al.*, 2011). However, the findings showing the contrast between believing innovation is a skill and believing innovation is a random, unstructured process suggest there is much work to be done. This disconnect explains why teaching any type of innovation methodology can be difficult, at best.

The survey results raise questions regarding the effectiveness of any training methodology or the potential for internalization of any methods for a structured process or practice for innovation. If learners do not believe that innovation is a skill that can be trained and practiced in a way that affords process measurement and improvement, they are less likely to internalize the training of methods or practices for innovation. In short, when individuals believe that quality, researched innovation methods can be a successful route to product or process improvement, they will be willing to learn those methods and to support their implementation across the organization. Assessing the mindset first enables trainers and leaders to work effectively to build innovation as a practice for their organization.

In developing future training and instruction, it will be incumbent upon trainers to seek to educate learners that hallmark phrases (“blinding flash”, “flow”, “intuition”, “letting go”, “openness”, etc.) – phrases found in the textual comments, are not the reality for most innovation and that when they remove these phrases from their lexicon, they will begin to appreciate the development of innovation as a skill and as a process that is much less random than might have been believed earlier.

Furthermore, because beliefs are often tightly held, simply telling individuals that their beliefs are not supported by the research surrounding innovation is generally an ineffective path toward better understanding. Pathways that allow individuals to see for themselves that these old beliefs are unproductive need to be developed and tested (in true innovative fashion) before effective training can be presented, with an expectation of successful internalization of the ideas and methods.

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Appendix A - Survey

[The following survey questions are from the published survey by Boyd and Goldenberg (<https://www.insidetheboxinnovation.com/wp-content/uploads/files/are-you-an-innovator-quiz.pdf>)] The italicized line was added to provide additional context for the question for those not familiar with the history of Post-it® notes.

Are you an Innovator?

Place a check mark beside the statement you agree with most

1. A. Innovation occurs by adding features to a product.
B. Innovation occurs by taking features out of a product.
2. A. Innovation is finding problems that are solved by hypothetical solutions.
B. Innovation is finding solutions to difficult problems.
3. A. I am more likely to innovate when I work alone.
B. I am more likely to innovate when I work in a group.
4. A. Innovation is more about creating novel ideas.
B. Innovation is more about selecting the best ideas.
5. A. When I innovate, I “brainstorm” ideas out of my head.
B. When I innovate, I follow a series of steps to find ideas.
6. A. Innovating is predictable and not risky.
B. Innovating is unpredictable and risky.
7. A. The ability to innovate is a gift that you are born with.
B. The ability to innovate is a skill that you can learn.
8. A. I prefer ambiguity when pondering new ideas.
B. I prefer clarity when pondering new ideas.
9. *The glue on the back of Post-it® notes came from a mistake in making glues.*
A. The Post-it Note is a good example of innovation because it was spontaneous.
B. The Post-it Note is a bad example of innovation because it was spontaneous.
10. A. I feel responsible for innovating new ideas.
B. I feel others are responsible for innovating new ideas.
11. A. Innovating is a random, improvisational, back-and-forth experience.
B. Innovating is a systematic, linear experience.
12. A. Constraints on resources like time and money drive innovation.
B. Constraints on resources like time and money inhibit innovation.
13. A. Homogeneous groups are more likely to innovate.
B. Diverse groups are more likely to innovate.
14. A. Innovation can be scheduled. It can occur anytime I want.
B. Innovation cannot be scheduled. It occurs randomly.
15. A. Innovation is an unstructured process.
B. Innovation is a patterned, “templated” process.

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Additional demographic and open-ended questions included in the survey were as follows:

- (1) Your approximate years of professional experience.
- (2) Your role in innovation for your organization.
- (3) Tell us a non-proprietary story about a successful innovation. What was unique about it?
- (4) Any other thoughts on innovation strategy that you'd like to share?

Developing an
innovation
education
mindset

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