

A Corporate Fitness Centre for Innovative Capabilities: New Insights on how Creativity Training can Develop Creative Competencies, Creative Confidence and a Creative Team Culture

Christian Byrge

Vilniaus kolegija,

Faculty of Business Management, Vilnius, Lithuania.

Abstract

Design Thinking, Brainstorming, Lateral Thinking, Creative Problem Solving... Most creativity methods focus on facilitating short term enhancements of creativity during workshops and meetings. However, research on creativity training suggests that it is possible to make real advancements in creative competencies and confidence, thus making creativity become like a habit. This paper explores how a 12-week creativity training program affected nine teams involving more than 240 managers and employees at a large multinational medical company. The results provide deeper understanding for how teams develop a common language about creativity, how they produce more ideas, how they think up more perspectives, how they are more confident in complex problem-solving tasks as well as how they consider their new creative competencies meaningful for their everyday work tasks. The paper provides practical recommendations for how managers and leaders can develop more innovative teams.

Keywords: Organizational Creativity; Creative Competencies; Innovation; Innovative Process
Innovative capability; Creative Process.

Introduction

Creativity is important for innovative activity (Sarooghi et al., 2015), for making better decisions (Brøndum et al., 2018), for developing original solutions (Grant, 2016) that can provide differentiation and competitive advantages (Brown, 2008). Creativity is also important for envisioning how new technologies may create opportunities in the market and for the organization (Verganti, 2011), and for challenging and replacing declining ideas with more valuable new ideas (Byrge & Gómez, 2019).

There are lots of effective applied methods for temporary enhancement of creativity, including Design Thinking (Brown, 2008), Lateral Thinking (de Bono, 1992), Creative Problem Solving (Parnes, 1992), Mind Mapping (Wycoff, 1991), Brainstorming (Osborn 1953), TRIZ (Altshuller, Shulvak, Rodman & Fedeseev, 1997), and The Creative Platform (Byrge & Hansen, 2015).

However, creative methods are often used like dieting programs, resulting in astonishing results for a short period of time, but which often reverse or stop working when no longer fully facilitated. If you want to achieve lasting weight

loss, you can replace the dieting programs with a lifestyle change. The same might be the case for creativity. In order to make lasting creative advances, you may need to learn how to be naturally creative, and you may need to gain a new creative confidence (Byrge, 2020).

What if it would be possible to develop creativity as a set of competencies and as a confidence, so that creativity becomes like a second nature for employees (and managers). Developing creative competencies and creative confidence may be a gamechanger for managers to start “managing creative employees,” rather than spending their time primarily “managing short term processes for creativity”.

Research on creativity training is quite clear that creative competencies can be developed through training. In their meta-analysis of 70 creativity training programs, Scott et al. (2004) found that “well-designed creativity training programs typically induce gains in performance with these effects generalizing across criteria, settings, and target populations.” Recent studies also found a significant effect on creative self-efficacy from creativity training (Byrge & Tang, 2015; Hänninen et al., 2020). Creative self-efficacy is a confidence in one’s own creative ability that brings a higher tolerance for the risk of failure and negative social evaluation that is often associated with creative performance (Tierney & Farmer, 2002). Research has found a relation between creative self-efficacy and creative production (Choi, 2004; Redmond, Mumford, & Teach, 1993; Tierney & Farmer, 2004). While creative competencies may provide potential for creativity, it seems that creative confidence plays a role in turning this potential into creative performance.

Most of the research on creativity training has been conducted as laboratory-like experiments using standardized pre- and post-tests for measuring creative performance. There are only few focused on creativity training in company settings and they provide little insight into how creativity training may result in more creativity during everyday work tasks (see for example Birdi et al., 2012).

This paper examines the effects from a 12-week creativity training program integrated in a large multinational medical company across nine teams involving more than 240 employees and managers. It explores how the new creative competencies and the new creative confidence are changing everyday work tasks.

A Creativity Competency Model

Creativity training programs date back at least to the 1960’s, where Freedman (1965) tested the effect from association training. Over the years, more advanced creativity training programs have been developed and tested on a variety of audiences using a variety of training content and methods of delivery

(Tang et al., 2018). It seems that researchers tend to design creativity training programs based on their own individual perspectives on creativity (Caughron et al., 2011). Therefore, we are still in need of a generic model for designing creativity training programs.

However, researchers provide some emerging notions for a creativity competency model. For example, in their study of innovative entrepreneurs, inventors and CEOs, Dyer et al. (2009) identified five “discovery skills” important for innovative thinking. Also, in his work on the famous creativity test (TTCT), Torrance (1974) identified 17 variables that are distinct and measurable for creative people. And, in his competency hierarchy model, Byrge (2020) identified 20 creative competencies that can be advanced through training. Byrge (2020) also suggested a hierarchy where creative competencies are categorized according to the expected level of creative impact from the training.

A conceptual analysis of previous research on creativity training revealed a 2-dimensional creativity competency model (see figure 1). The first dimension defines three ambition levels for creativity: Being more creative in everyday problem-solving as the lowest ambition; being more creative in innovation processes as the medium ambition; and being more creative in works that have potential to transform entire industries as the highest ambition level.

In order to understand the level of ambition, it is possible to use an analogy from football. The lowest ambition level is to learn how to play football (how to be creative). The middle ambition level is to learn how to play against professional teams (learn how to work creatively on a professional level). And the highest ambition level is to learn how to set new standards for what football is (learn how to set new standards in the industry).

Competency group / Ambition	Problem Discovery	Idea Development	Solution Finding	Acceptance Making
Industry breakthroughs require competencies to...	... challenge what others consider standard.	... imagine scenarios that defy current logic.	... spot novel ideas & ethical considerations.	... persuade key gatekeepers, in spite of resistance.
Innovation processes require competencies to...	.. discover important values & needs of users.	.. combine ideas across domains and professions.	... curiously explore wild ideas with an open mind.	... express ideas to an interdisciplinary audience.
Creative problem solving requires competencies to...	... identify areas of potential for improvement.	... perform focused production of alternative ideas.	... elaborate ideas without judgement.	... present new ideas to colleagues and leaders.

Figure 1: Creativity Competency Model

The second dimension defines four groups of creative competencies: Competencies related to problem discovery as the first group; competencies related to idea development as the second group; competencies related to solution finding as the third group; and competencies related to acceptance making as the fourth group. You need problem discovery competencies to get a good starting point for your creative efforts. You need idea development competencies to increase the number of ideas and directions of thinking. You need solution finding competencies to make more ambitious and learning oriented decisions. You need acceptance making competencies so that your ideas will be accepted by gatekeepers, stakeholders and others.

First, you identify your ambition level for creativity. Next, you identify the group of creative competencies that you need. Now, the model will show you the specific creative competence you need to develop for your organization. For example, organizations with ambitions to become better at solution finding in everyday problem-solving should develop competencies to elaborate ideas without judgement. Organizations with ambitions to become better at problem discovery in their work on transforming the industry should develop competencies to challenge what everyone else considers standard. And organizations with ambitions to become better at acceptance making in innovative processes should develop competencies to express ideas to a complex interdisciplinary audience, for example by using a mix of communicative means like video presentations, roleplay, prototypes and a pitch.

Designing a Creativity Training Program

Now, imagine you want to design a creativity training program developing competencies to combine ideas across domains and professions. What training content should be used in such a creativity training program? Tang et al. (2018) identified how training programs can include everything from creativity theory and discussion, stories of fictive and real-life role models, creativity tools, practical exercises and workshop activities, counselling, written assignments as well as role-playing, acting and creative movement of the body. Yet, there are not universal models for creating creativity training content.

However, researchers do provide emerging notions for such a model. For example, Scott et al (2004) found that the more successful creativity training programs use “realistic exercises appropriate to the domain at hand.” Such exercises may include problems related to trainees’ everyday work tasks. Yet, Byrge (2020) found that general creativity (non-domain) exercises can help trainees get used to the new competencies in a “sandbox” experience. Domain related exercises can create fear of judgement or make trainees lose face because wild ideas may be negatively evaluated by colleagues as lack of knowledge about the domain. Byrge (2020) suggests a 2-step model, where step 1 in a creativity training program would be dominated by general creativity

exercises. As the trainees gain confidence in the new creative competencies, they would move on to step 2 that would be dominated by domain related creativity exercises.

Dyer et al. (2009) suggest a four-step training model: A. Understand, B. Practice, C. Experiment, and D. Gaining confidence. They emphasize “the importance of rehearsing over and over the behaviors (...) to the point that they become automatic”, and even suggest to practice on a daily basis. Kelley & Kelley (2012) find that creative confidence may be the most important element and suggest that “half the battle is to resist judging yourself.” Byrge (2020) suggests that the trainees go through certain phases during the practice: The most important ones being the intermediate phase where they master the new competence as a tool, and the final phase where they master the new competence like a second nature.

A metaphor from football (soccer) training may help us better understand the need for practice and confidence. If you want to become good at football, then it only helps a little to watch televised football matches or to discuss football over a pint of beer. In football the coach can help you understand your areas of improvement, and can help design a training program to make you make those improvements. Continuous practice will eventually make you master the new football competencies like a second nature during your gameplay.

The same is the case for creativity. We need to develop systematic creativity training programs to advance from merely understanding creativity, to mastering it like a second nature. It is possible to design the training programs as a three-step model:

- Provide understanding on the selected creative competencies and how they can be practiced.
- Facilitate a period of frequent practice using general creativity exercises and domain related creativity exercises.
- Support and assist experiments in using the newly acquired creative competencies on everyday work tasks, meetings, projects, etc.

Step one will help the trainees master the new creative competencies as a concept. Step two will help the trainees master the new creative competencies as a tool (or method). As the trainees move from step one to step three, they will gain multiple successful experiences in applying the new creative competencies. This will help develop their creative confidence and will eventually turn the new creative competencies into a habit for the trainees – to become like a second nature.

Creativity Training in a large Multinational Medical Company

During a 2-year period the author followed the implementation of creativity training across five production management teams (118 managers), three sourcing operation teams (104 employees and managers) as well as one quality expert team (19 employees and managers), in a large multinational medical company. The production management teams were implementing creativity training in order to improve their Lean production activities. The sourcing operation teams were implementing creativity training in order to improve their innovation sprint activities. The quality expert team were implementing creativity training in order to improve their complex problem-solving activities.

Following a discussion based on the creativity competency model (figure 1), all teams decided to implement a creativity training program developing competencies to “combine ideas across domains and professions” and to “curiously explore wild ideas with an open mind.”

The expectations for the training were as follows:

- Teams would develop a common language about creativity.
- Teams would produce more novel ideas.
- Teams would think up more alternative perspectives before making decisions.
- Teams would be more confident performing complex problem-solving.
- Teams would consider the new creative competencies meaningful for their everyday work tasks.

Combine Ideas across Domains and Professions

The combination of ideas is central to cognitive perspectives on creativity (Ward & Kolomyts, 2010), but it is also evident in business innovation perspectives on creativity (Martins et al., 2015). Dyer et al (2009) suggest that the “insights required to solve many of our most challenging problems come from outside our industry and scientific field”, while Bouquet et al. (2018) point out that creativity is to “... apply an existing solution from one domain to another”. However, which combinations that lead to great innovations are difficult to predict (Kirby (2012). de Bono (1992) specifically stresses the importance of making random combinations to explore new directions of thinking.

Imagine having to innovate processes related to a supermarket checkout. We need an unrelated random object, profession or organization to help generate new inspiration: Let’s choose “Airport.” We now search for related problems or interesting features related to an airport. The airport security checks have some related problems that are worth trying to combine with the supermarket checkout. Airport security checks often ask airplane passengers to put their jackets, belts, hand luggage, liquids, phones, tablets and computers into plastic

boxes, and to put these plastic boxes onto a belt taking them into a scanning area. In the supermarket, such plastic boxes could be hanging onto the shopping carts for customers to put their goods into while shopping. Once they arrive at the checkout, there is no need for them to remove all their products from the cart and place them onto the belt. Instead, they simply detach the plastic boxes, with the products inside, from the cart and put them onto the belt. Taking 2-4 plastic boxes from the cart and onto the belt would be easier, faster and more comfortable than having to move each individual product to the belt. Also, the stability of the plastic boxes may reduce the risk of damage to soft products like fruit and vegetables. This is an example of how to combine ideas from airport security checks with the supermarket checkout.

The training exercises developing competencies to “combine ideas across domains and professions” were designed to provide multiple positive creative experiences similar to the example above.

Curiously Explore Wild Ideas with an Open Mind

Curious exploration is considered as a fundamental element for successful innovators, entrepreneurs and creators. Considering the “world as their laboratory” (Dyer et al., 2009), creative people do not mind exploring what may result in a dead end. Such a result is not a failure, rather it is considered new learning. In the search for better solutions, creative people postpone making up their mind while searching for new perspectives that extend or challenge their current understanding. Dyer et al. (2009) found that innovators set up so-called ‘improbably thought’ experiments to initiate creativity, like “what if we were legally prohibited from selling to our current customers?” It is about dismantling deeply held assumptions (Kyrbi, 2012), to better see the problems and ideas from new perspectives. Bouquet et al. (2018) find that expertise makes it difficult to keep an open mind, thus reducing the chance for new insights”. They suggest that asking uninhibited questions like “what if...?” can help steer away from this unconscious blinding.

Imagine working for a large doctor’s clinic. One of the leaders suggests installing a drive-thru system similar to that at McDonalds and Burger King. Patients could then sit in their car and be seen by their doctor through the window – as an appointment-free faster service for those who are busy. You may instantly like or dislike the idea. However, the key is to defer making up your mind about this idea. Also, do not share your immediate opinion about the idea to others. This will only put you in a situation of positioning, thus potentially leading to an endless argumentation where you try to defend your ideas while attacking others’ ideas. Curious exploration is not about winning an argument, rather it is about learning as quickly as possible. It is about having an open mind so you can truly understand others’ perspectives as well as perspectives that are beyond that of your team. Now, first you explore only the potential positive

consequences that may derive from this idea. Focusing only on positives will create a cognitive spiral effect that will make it easier for everyone to come up with even more positives. It is also easier to understand all these positives because everyone has an open mind, not trying to argue for or against any particular position. Next, you explore only the potential negative consequences that may derive from this idea. And finally, you explore potential alternative ideas that may bring about some of the same identified positives without having the same identified negatives. This is an example of how to curiously explore a wild idea like a “drive-thru system at a doctor’s clinic” with an open mind.

The training exercises developing competencies to “curiously explore wild ideas with an open mind” were designed to provide multiple positive creative experiences similar to the example above.

Research Procedure

The creativity training program was implemented across the nine teams using the following six steps.

- The author conducted a series of meetings with team managers discussing ambitions, rationale and the intention of the creativity training program related to each team.
- The author designed a 12-week creativity training program for each team: the first six weeks developing competencies to “combine ideas across domains and professions,” and the final six weeks developing competencies to “curiously explore wild ideas with an open mind.” Domain related creativity exercises were co-developed with team managers and team ambassadors. All training exercises were designed based on the exercise design system developed by Byrge (2020). See figure 2-5 for examples of exercises from the training program applied for the 12-weeks training.
- Each team participated in two workshops (a kickstart workshop and a mid-way workshop). During these workshops the teams were introduced to the ambitions, rationale and intention of the training. The workshop included several creativity training exercises similar to those in the training program.
- The 12-week training period was divided into two six-week phases with a short break in between. In the first training phase the teams met 10-15 minutes per day, five days a week, to perform creativity exercises. They performed these exercises in pairs that rotated every day, so that they had a chance to experience being creative with several different team members in a one-to-one setting. In the final training phase, the teams met 20-25 minutes per day, two/three days a week, to perform creativity exercises. They performed these exercises in small groups of 3-5 that rotated once a week, so they had a chance to experience being creative with many different team members in a team setting. The training exercises were

scheduled (whenever possible) in the mornings in order to increase the chance for a positive transfer effect to other activities during the work day.

- At the end of the training period each team participated in a short end-seminar. During this seminar the teams were reminded of the ambitions, rationale and intention of the training. The seminar included discussions on how and where to apply these new creative competencies and confidence in everyday work tasks.
- After the end-seminar the teams continued their training following one of three approaches. One team introduced obligatory monthly creative sessions applying the new creative competencies on relevant domain problems; three teams were encouraged to participate in regular innovation challenges; and five teams were continuing with weekly creativity exercises (a mix of domain related and general creativity exercises).

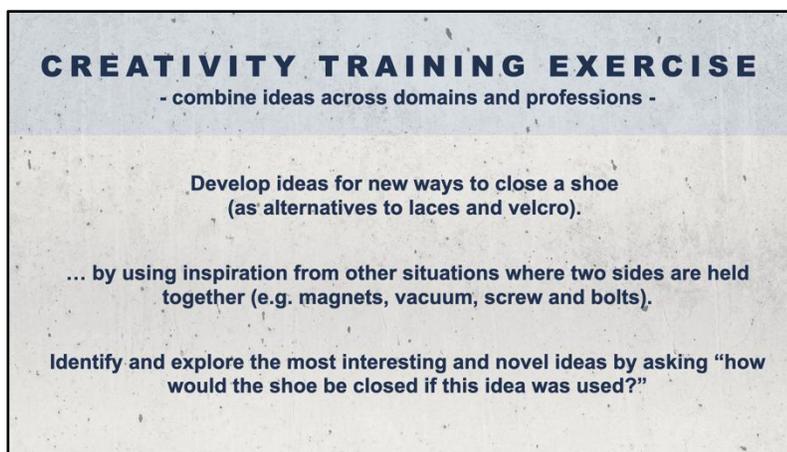


Figure 2: First example of an exercise to develop competencies to combine ideas across domains and professions.

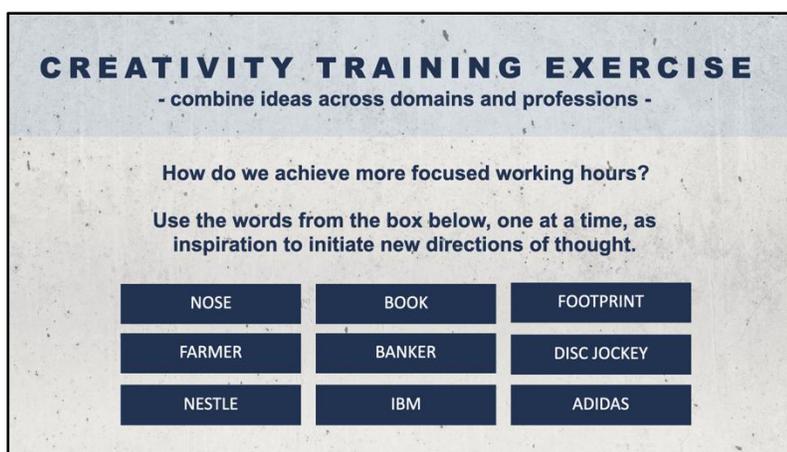


Figure 3: Second example of an exercise to develop competencies to combine ideas across domains and professions.

Data was collected before, during, and after the implementation of creativity training. The first data was collected five months prior to the first

team's kickstart workshop (P3). The last data was collected 12 months after the first team's end-seminar and two months after the last team's end-seminar (P5). The primary data was collected using the following three key sources:

- The author played a role as an engaged scholar in the planning, execution and reflection on the creativity training. This provided a deep and broad insight from team managers, employees, human resource managers, training coordinators and creativity ambassadors.
- The author performed a total of 27 semi-structured interviews with team managers and selected employees as well as training coordinators. The interviews were primarily focused on understanding how the training affected the daily work life for the teams.
- The author conducted two surveys for each of the five production management teams, a total of 10 surveys. These surveys were focused on understanding the engagement in the creativity training, the motivation for becoming more creative, and the transfer of the new creative competencies to everyday work tasks.

CREATIVITY TRAINING EXERCISE
- curiously explore wild ideas with an open mind -

The majority of leadership positions in the company are male. Imagine that for the next two years we would only promote and hire female candidates for future leadership jobs.

STEP 1 Think up only potential positive consequences from this idea.
STEP 2 Think up only potential negative consequences from this idea.
STEP 3 Think up only potential alternative ideas.
STEP 4 How may your daily work tasks benefit from a curious open mind?

Figure 4: First example of an exercise to develop competencies to curiously explore wild ideas with an open mind.

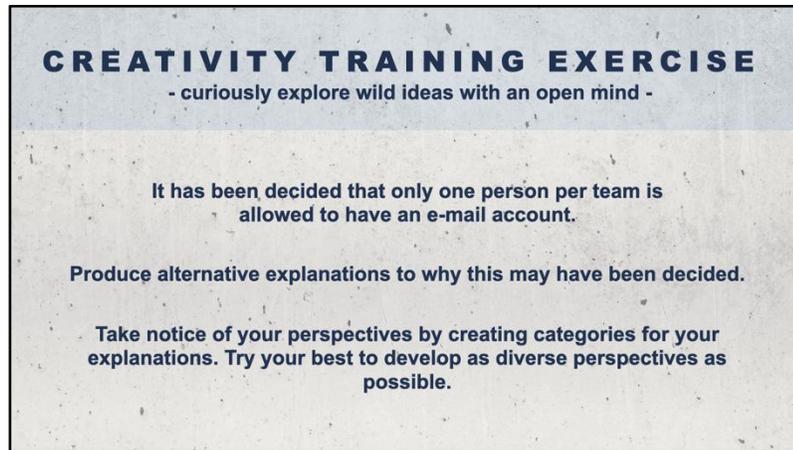


Figure 5: Second example of an exercise to develop competencies to curiously explore wild ideas with an open mind.

Results

A conceptual analysis of the data resulted in the following findings.

Teams would develop a common language about creativity.

The team managers expected that the teams would develop a common language about creativity. One of the first signs of this new language was seen in the demystification of the term “creativity.” It quickly became accepted that creativity is not simply an artistic talent reserved for those born this way. Nor is it just an alternative definition of innovation.

Interactions on creativity evolved to include more elaborate definitions of creative thinking, creative behavior, creative problem solving as well as formal procedures for what is meant by a creative meeting, session or workshop. One of the team managers reported how he saw “a clear improvement” in developing a language of creativity in his team. He gave an example of how he uses a picture from one of the creativity training exercises as a symbol for when he expects creative efforts from his team. When he shows the picture at the start of a meeting or project work, then team members quickly get into the creative mode.

The emergence of a new language about creativity was particularly clear when the teams were doing work, attending meetings or performing innovation challenges with other colleagues, who had not attended the creativity training. There were several reports of how much easier it was being creative with other creativity trainees than with colleagues from teams that had not participated in the training.

The new language about creativity also gave new understandings about when to be creative and how to be creative. One employee reflected “who knew it was possible to practice creativity – that it is not just for the yellow Insight profiles,”

while another reported how he had never before (before the training) been aware of “... what helps initiate a creative process, and when creativity may be valuable”.

A team manager suggested that the emergence of this new language on creativity seemed to help establish a common cross-team, cross-department and cross-site culture for how to solve complex problems together.

R1. Teams would produce more novel ideas.

The team managers expected that the teams would produce more novel ideas as a result of the training. It is possible to define novelty on a relative scale, where ideas that are historically new (new to mankind) are at the highest level, while ideas that are only new to the individual are at the lowest level. In between these extremes we will find ideas that are new to the team, new to the organization, new to the industry, etc.

There was a consistent experience that it became easier to produce more ideas and ideas of higher novelty, although only few managers and employees experienced producing something that they considered historically new. One reported how he had not seen any of those “... I am blown away” -type of ideas. Rather he experienced that the training gave a good “... space for being creative with colleagues.” An employee explained how the training had allowed her to “... think up wild thoughts and bring about crazy ideas,” and she elaborated how “... some of these ideas may end up being genius.”

Another reported how her team had “... become far better at thinking up new ideas.” She explained how her team for years had been using Lean for continuous improvement of their processes, and how the training felt like a “higher level of Lean, where more ideas and more advanced ideas were introduced.” She elaborated: “At first I thought it seemed silly to spend time practicing creativity, but now I have learnt to produce ideas on command.”

The analysis also revealed an increase in the creative perseverance for producing more ideas. One employee reported: “I push myself for more ideas each time I need to make a decision, and if I have few (ideas) – then I ask somebody, not directly involved, for help to produce more ideas.” Another employee had started consequently asking fellow colleagues to consider more solutions during everyday problem-solving meetings. Yet another reported: “I feel that I am now able to squeeze out more ideas that I have inside of me.” A manager explained how she often hears her employees talking about their “great inventions” over a cup of coffee, after finishing a daily training exercise.

R2. Teams would think up more alternative perspectives before making decisions.

The team managers expected that the teams would think up more alternative perspectives as part of decision-making processes. The notion is that more alternative perspectives would provide a better foundation from which to make decisions. That it would disrupt the traditional strong positioning that takes place during decision making processes and thus lead to a more curious open-minded process.

One of the team managers explained how he had started systematically presenting several alternative perspectives as well as their pros and cons, when he delivers his recommended solutions to his superior. He made it clear to his employees how he also expected them to do the same, when they present ideas to him. He wanted to know what other ideas they had considered before making up their mind about which solution they consider to be the best. An employee explained how, when a fellow colleague approached her with an idea, she would ask them: “Can I hear your alternative ideas.” There was a clear cross-team effect on how employees and managers started to expect their colleagues to be more open minded in creative problem solving. A team manager even suggested that the training has helped “...ease the communication on ideas among people and leadership.”

However, the most consistent effect was more related to how both managers and employees found themselves to be more open minded. One employee reported how she could now more easily overcome her “negative attitude” towards other peoples’ ideas, and explained how she now tried “being the first one to challenge my own ideas.” Another reported that it was now easier to follow other peoples’ perspectives. That it was even easier to stay open minded in trying to understand why a colleague may have done something that, at first, may seem like a bad idea. A third employee reported how they have become “... better at exploring new directions of thinking.” Yet another employee explained how she has “... started to think bigger and evaluate all possible consequences for the case” explaining how it helps “...not to drive yourself into a frame.” The most consistent experience was related to how it became easier to accept alternative opinions and learn the assumptions behind these opinions – to temporarily try to look at the problem from the same perspective as colleagues.

R3. Teams would be more confident performing complex problem-solving.

The team managers expected that the teams would become more confident performing complex problem-solving. The notion was that an increased level of creative confidence would increase the likelihood that the new creative competencies would result in actual creative thinking and behavior.

One team manager identified a significant difference in employees’ attitude

towards creative problem solving. She explained how her team “had become far more positive towards working on complex problems,” and that her team “seemed far more comfortable working creatively with colleagues.” She reflected on how her team used to be resistant towards taking on complex problems, and that they tend to postpone working on such problems. Now they seem to enjoy the complex problems, and they more often start working on them right away. An employee reported how the complex problem-solving ideation used to stall after a few ideas. Now, it seems easier to continue the production of ideas for such problems.

Managers and employees consistently reported how they had a “*wish for*” applying creativity in everyday work tasks. However, some managers and employees expressed how their lack of creative confidence, though improved during the training, was still a barrier for applying creativity across all kinds of work tasks. While most were confident applying creativity on individual work tasks and in work that obviously needed creativity, some reported that they were afraid how colleagues would react if suddenly a meeting would be conducted in a creative way. Also, some employees and managers were unsure if the creative efforts during a meeting would lead to the results they were hoping for. This fear would sometimes result in meetings and work tasks being planned in traditional (non-creative) ways.

It seems that the most important advancement in creative confidence was related to the individual level, and to a lesser degree related to the social level. This was most evident in their self-perception. One employee reported how, at the beginning of the training, she felt uncomfortable expressing her wild ideas. Now, she finds it increasingly fun, interesting and energetic. Another explains how she has learnt more about her creative strengths, and that she has experienced how it is okay “... to be strong in some creative processes and less strong in others.”

R4. Teams would consider the new creative competencies meaningful for their everyday work tasks.

The intention of the creativity training was to develop new creative competencies and confidence that could be integrated into everyday work tasks, not to introduce new alternative process methods or tools. As such, it was an expectation from team managers that the employees would transfer the new competencies into their everyday work tasks.

The analysis revealed what seems to be a three-step transfer of the new creative competencies to everyday work tasks. Step one was to perform the creativity training exercises. In this step, managers and employees seemed to prefer focusing primarily on gaining the new creative competencies and confidence, and less on using them in their work tasks. Step two was a period of applying the

new creative competencies during formal meetings and project workshops. During this step, it was necessary to have the organizer of the meeting or the workshop to facilitate the participants to be creative. Step three was a period where employees started applying the new creative competencies in their everyday work tasks. During this step, team managers started setting expectations for employees' creative performance.

The preparations for step one revealed critical issues to be handled as part of the planning of creativity training. In three of the teams, the managers were hesitating towards the amount of time needed for performing the weekly training, how they were supposed to measure the effect from the training during everyday team management, and how they could communicate the intention of the training to the trainees. Also, these team managers were all hoping for instant effects, as opposed to the other team managers that had a more long-term "journey" perspective on the effect from the training. In order to avoid confusion among trainees regarding the priority and intention of the training, it was decided to postpone the training for these three teams until this hesitation had been met with hands-on solutions. One of these solutions included a leadership tool for how to set expectations for creative thinking and behavior during everyday work tasks. Another solution was to have more training weeks with less training days per week. In one team it was decided to make a larger portion of the training exercises based on real problems directly related to the team (domain related creativity exercises). And finally, these team managers took an extra effort explaining how the new creative competencies were to help improve specific work tasks in the teams. Yet, these three teams were still having the most difficulties making the trainees comply to the training exercises, thus ending up with more cancelled training exercises than the other teams.

While step one and two were dominated by direct facilitation and structure, it seemed that step three was more dynamic and unpredictable. In some teams, employees quickly started applying the new creative competencies in all sorts of everyday work tasks and personal life situations, including budget discussions, strategic processes, workshops, house renovation, project work, interviews, stakeholder involvement, developing new test systems, inventing new kids' games, and developing a new online monitoring system, as well as for asking critical questions and handling production deviations. These applications of creativity were quite informal and sometimes the employees did not even recognize that they had applied their new creative competencies until after the meeting or after completing the work task.

However, other teams were focused on making a more formal transfer of the new creative competencies, like integrating creativity into the standards for how to conduct formal Lean processes or into the standards for how to handle formal

deviations in production. This formal transfer of creative competencies seems to be more complex. One manager reported that, while the "... training generally made sense, it was difficult to prioritize a formal integration of the new competencies - between all other business activities". He explained how he felt fatigue among some of his employees, and that they had difficulties seeing how it would benefit their formal work processes. He continued explaining how he and his team "... need to be patient. It can take some time for all to understand how we can use it in our daily business." Another team manager made his expectations clear, explaining how he would no longer tolerate statements like "I am not here to be creative; I am here to work." He repeatedly communicated how creativity should be part of how to perform everyday work tasks, not something separated from this. Setting clear, yet patient, expectations for the application of creativity seems to help get the momentum going. As one employee puts it: "He (the manager) has strongly communicated that we need to prioritize this. This made it easier. It helped keep the spirit high." She elaborates how this management support helped those intrinsically motivated for creativity to overrule those who suggest to keep doing it "the traditional way".

There was generally a positive experience of the creativity training across all teams. Although three employees felt negative towards the training and made it clear how it did not make sense for their everyday work tasks, most other employees either agreed or completely agreed that the training made sense for their everyday work tasks. Unfortunately, it was not possible to identify and interview these three respondents to better understand their supposedly negative experience about creativity or creativity training. The perception across the teams was consistently positive overall. One team even had an impressive feedback of five out of five on all questions related to the training and its effect on everyday work. One employee even reported how his future work role will be to "... think out of the box."

R5. Other results

During the 2-year period of this study, other teams in the medical company started implementing creativity training. Unfortunately, it was not possible to collect data from these teams consistently from both before, during and after the creativity training. However, it was possible to collect some data related to the design of the training as well as on the implementation of the training. An interesting finding revealed five unique approaches for making decisions on the design and implementation of the training: A top-down approach where the management made most decisions; an ambassador driven approach where one or two of the employees would make most decisions; a democratic approach where employees would vote about the most important decisions; and finally a voluntary approach where an internal HR or process consultant would make most decisions and employees would join the training on a voluntary basis.

There were also some interesting findings related to the method of delivery of the creativity training. Few managers and employees performed all scheduled training exercises. Due to sickness, holidays and urgent work matters, most managers and employees had to cancel one or more of their training exercises. In one team almost 20% of the employees had to cancel more than half of their scheduled exercises, while another team managed to make a highly effective rescheduling of the training to avoid cancellations.

The training program included both general creativity exercises as well as domain related creativity exercises (related to real problems in the medical company). The notion was that the general creativity exercises were easier, yet less motivating, to perform. The domain related creativity exercises were expected to be harder, yet more motivating to perform. However, there was a general understanding across most teams that the general creativity exercises were both more fun, meaningful and more motivating than the domain related creativity exercises. While everyone agreed that the expected results from the training was to apply the new creative competencies to everyday work tasks, most felt that working on general creativity exercises was more effective in terms of providing the necessary positive creative experiences with colleagues. More research is needed in order to clearly understand the relationship between domain related and general creativity exercises.

Recommendations for Managers on Creativity

The research and results in this paper provide the following new insights that can help managers and leaders develop more innovative teams.

- ***Want your team to become far more innovative?*** You may consider implementing creative processes or implementing a better idea collection and evaluation system in your team. However, you can also consider implementing creativity training in your team. This paper provides insight into how teams can practice their creative competencies, creative confidence and thus develop a creative team culture. It examines how creativity training can help teams develop a common language about creativity, produce more ideas, think up more alternative perspectives, and become more confident performing complex problem-solving. The paper also provides insight into how new competencies from creativity training are considered meaningful for everyday work tasks. Creativity training seems to have an important impact on building innovative habits in a team to become creative on a daily basis. This is distinct from the more process-oriented approaches that often need facilitation and are typically separated from everyday work tasks in both time and space. It is also distinct from the “idea-box” approaches where the notion is rather to collect and evaluate current

ideas in the team, and less so to build creative capabilities and a creative team culture. So, one of the most fundamental questions to ask yourself is whether you want a creative team or a creative method?" Creativity training can help you develop a creative team.

- ***What creative competencies to develop in your team?*** Your ambition level for innovation determines the type of creative competencies you need to succeed. So, what are your ambitions for innovation? To become better at everyday creative problem solving? To become better at performing innovative processes? Or to be able to make fundamental breakthroughs in your industry? This paper suggests a creativity competency model that connects ambitions for innovation with relevant creative competencies. The model groups relevant creative competencies according to the purpose of creativity: problem discovery, idea development, solution finding, and acceptance making. Go to figure 1 to evaluate which creative competencies you need to develop in your team in order to reach your ambitions for innovation.
- ***Build your own corporate fitness center for innovative capabilities.*** It is a good idea to think about creativity training as a fitness center for building innovative capabilities. Your goal is to make lasting changes, but in order to get there you need to practice. The first step is to build creative confidence. You need to provide your team with a series of successful creative experiences. Fear of judgement and pattern thinking can make it difficult to get successful creative experiences when working on real problems from your everyday work tasks. Therefore, it is a good idea to start off practicing your creative competencies on general problems from your personal life, such as problems related to cooking, shopping, hairdressing, shoes, beds, running, etc. Make sure the team members practice in small groups to ensure more interaction and less fear of judgement. Also, make sure that the team members try practicing with as many different colleagues as possible to learn each other's creative strengths and weaknesses. As creative confidence increases, you can include more exercises based on real work task problems in the training. Try your best to integrate the training exercises into your daily work tasks, for example in the beginning of your morning meetings or as a coffee break activity. Make sure that the training is integrated in a way so that it will eventually feel natural to perform the exercises as a daily routine in the workday. The more often you practice, the better. Try to think about the practice as short continuous training exercises. It could be designed as five-minute exercises twice a day, or as 10–20-minute exercises 3-5 times a week. Sometimes team members cannot perform their training because of sickness or urgent matters. Therefore, it is important to have a way to reschedule or retake the training individually

or with other colleagues. Make sure the managers and leaders are joining the training as often as possible. They will need to have the same creative experiences to know how to best support the application of the new creative competencies into everyday work tasks. Consider whether it is possible that the managers and leaders (or some training facilitators) could start the training before the other team members, so they could more easily help other team members apply the new creative competencies in a successful way.

References:

- Altshuller, G., Shulyak, L., Rodman, S., & Fedoseev, U. (1997). *40 principles: TRIZ keys to innovation*. Technical Innovation Center.
- Birdi, K, Leach, D. & Magadley, W. (2012). Evaluating the impact of TRIZ creativity training: an organizational field study. *R&D Management*, 42, 4, 315-325.
- Bouquet, C., Barsoux, J-L., & Wade, M. (2018). Bring your breakthrough ideas to life. *Harvard Business Review*, November-December.
- Brown, T. (2008). Design Thinking, *Harvard Business Review*, June.
- Brøndum, K., Byrge, C., & Hansen, S. (2018). Business model creativity: A horizontal insight model. *Journal of Business Models*, 6, 2, 10-14.
- Byrge, C. (2020). *How to teach creativity*. Business Research & Business Design.
- Byrge, C. & Gómez, P. N. (2019). Think piece: New perspectives for the role of creativity in education. *Journal of Creativity and Business Innovation*, 5, 2019.
- Byrge, C., & Hansen, S. (2015). *The creative platform: A handbook in creative processes for education and worklife*. Frydenlund Academic.
- Byrge, C., & Tang, C. (2015). Embodied creativity training: Effects on creative self-efficacy and creative production. *Thinking Skills and Creativity*, 16, 51-61.
- Caughron, J. J., Peterson, D. R., & Mumford, M. D. (2011). Creativity training. In *Encyclopedia of Creativity*, ed. Mark A. Runco and Steven R. Pritzker, 311-317. Elsevier.
- Choi, J. N. (2004). Individual and contextual predictors of creative performance: The mediating role of psychological processes. *Creativity Research Journal*, 16, 187–199.
- Davis, G. A., & Roweton, W. E. (1968). Using idea checklists with college students: Overcoming resistance. *Journal of Psychology*, 70, 221-226.
- de Bono, E. (1992) *Serious creativity: Using the power of lateral thinking to create new ideas*. Harper Business.
- Dyer, J. H., Gregersen, H. B., & Christensen, C. M. (2009). The innovator's DNA. *Harvard Business Review*, December.
- Freedman, J. L. (1965). Increasing creativity by free-association training. *Journal of Experimental Psychology*, 69, 1, 89-91.
- Grant, A. (2016). How to build a culture of originality. *Harvard Business Review*, March.
- Hänninen, L. I., Byrge, C., Gómez, P. N., Tang, C., Brøndum, K., Dingli, S. M., & Xerxen, S. P. (2020). Testing the effects of digital gamified creativity training. *Journal of Creativity and Business Innovation*, 6, 5-17.
- Kelley, T., & Kelley, D. (2012). Reclaim your creative confidence: How to get over the fears that block your best ideas. *Harvard Business Review*, December.
- Kirby, J. (2012). Are We Being Creative Yet? *Harvard Business Review*, March.
- Martins, L. L., Rindova, V. P., & Greenbaum, B. E. (2015). Unlocking the hidden value of concepts: A cognitive approach to business model innovation. *Strategic Entrepreneurship Journal*, 9, 99–117.
- Osborn, A. F. (1953). *Applied imagination: Principles and procedures of creative problem solving*. Charles Scribner's Sons.

- Parnes, S. J. (1992). *A source book for creative problem solving*. Creative Behavior Foundation. Redmond, M. R., Mumford, M. D., & Teach, R. (1993). Putting creativity to work: Effects of leader behavior on subordinate creativity. *Organizational Behavior and Human Decision Processes*, 55, 120–151.
- Sarooghi, H., Libaers, D., Burkemper, A. (2015). Examining the relationship between creativity and innovation: A meta-analysis of organizational, cultural, and environmental factors. *Journal of Business Venturing*, 30, 714-731.
- Scott, G., Leritz, L. E., & Mumford, M. D. (2004). The effectiveness of creativity training: A quantitative review. *Creativity Research Journal*, 16, 4, 361-388.
- Tang, C., Byrge, C., & Zhou, Jizhong (2018). Creativity perspective on entrepreneurship. In *The Palgrave Handbook of Multidisciplinary Perspectives on Entrepreneurship*, ed. Romeo V. Turcan and Norman M. Fraser. Springer.
- Tierney, P., & Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal*, 45, 1137–1148.
- Tierney, P., & Farmer, S. M. (2004). The pygmalion process and employee creativity. *Journal of Management*, 30, 413–432.
- Torrance, E. P. (1974). *The Torrance Tests of Creative Thinking: Norms-Technical Manual*. Princeton, NJ: Personal Press.
- Verganti, R. (2011). Designing breakthrough products. *Harvard Business Review*, October.
- Ward, T. B. and Kolomyts, Y. (2010). Cognition and creativity. In James C. Kaufman & Robert J. Sternberg, *The Cambridge Handbook of Creativity*, Cambridge University Press, 93-112.
- Wycoff, J. (1991). *Mind mapping*. Berkley Publishing Group.

Corresponding author:

Author can be contacted at: cb@christianbyrge.com.

About the author(s):

PhD Christian Byrge is a full professor at Faculty of Business Management, Vilniaus kolegija University of Applied Sciences (cb@christianbyrge.com). Christian has been engaged in creativity research for more than 15 years. He holds a long list of publications related to creativity, including books, book chapters, scientific papers and hands-on creativity toolsets. His methods have been taught to more than 100.000 professionals from the USA, Europe, Asia, Africa and Australia. Christian is the co-initiator and co-designer of one of the most ambitious creativity courses, the five-month full time “Creative Genius Program” as well as one of the lead developers of the world’s first online training system for deliberate practice of creative skills, “Academy for Creativity”. Christian regularly gives inspiring and energetic keynote speeches, lectures, teaches courses, facilitate workshops and does counselling on how to nurture the individual, team and organizational creativity.