3.3. INSTANTIATING OPEN INNOVATION: FROM INDIVIDUAL TO SOCIETY LEVEL

OPEN INNOVATION AT THE INDIVIDUAL LEVEL

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Abstract

This chapter consists of two modules. In the first module, we provide a theoretical overview of individual ambidextrous competences for Open Innovation. We categorize individual competences into professional, methodical, social, and personal competences, and discuss each of them. In addition, we suggest how these competences can support exploration and exploitation activities. In the second module, we provide a teaching case study in design thinking that aims at the development of individual innovation competences. We offer a detailed description of the teaching procedure, including pedagogical guidelines and teaching tips. The content of the two modules allows enriching teachers' and students' knowledge of innovation activities and developing their skills and competences in both creativity and organizational innovation.

This contribution is a reprint/extended and revised version of the article Hafkesbrink, J./Schroll, M.: Ambidextrous Organizational and Individual Competences in Open Innovation: The Dawn of a New Research Agenda, in: Mention, A.-L./Torkkeli, M. (Ed.) Open Innovation - A Multifaceted Perspective, World Scientific Publishing Co. Houston, Texas 77479, USA, ebook: goo.gl/tzSwff.

Prerequisite	Basic definition of Open Innovation, knowledge about ambidexterity in the open innovation process.
Objectives of the lecture	To impart knowledge about what individual competences are relevant for conducting open innovation processes. To develop open innovation competences through design thinking training.
Workload	Teaching; group work.
Learning outcomes	Knowledge **#40:** Innovation: to develop an understanding of the role of creativity and innovation for value creation and competitiveness. Skills **#3:** Creativity: to recognize and evaluate the creative process in individuals and teams and how it contributes towards increased innovation. **#8:** Creativity: to develop creative thinking skills and methods. Competences **#4:** Creativity: to apply idea generation tools to add value to the product/process/service/ business model in an organization. **#5:** Creativity: to know how to plan and manage a creative process. To apply creative thinking methods in innovation and personnel management. **#9:** Creativity: to apply techniques for inventive problem solving. **#65:** to apply methods and techniques utilized in Stage Gate or Design Thinking individually. **#80:** Organizational Innovation: to be able to evaluate and monitor organizational innovation. **#83:** Organizational Innovation: to implement change and develop leadership skills. **#84:** Organizational Innovation: to implement communication skills as a contributing factor to innovation. **#85:** Organizational Innovation: to be able to apply knowledge about the mediating factor of transformational leadership and their influence on innovation.

Reading List	Individual Competences Hafkesbrink, J., & Schroll, M. (2014). Ambidextrous Organizational and Individual Competencies in Open Innovation: The Dawn of a new. Research Agenda. Journal of Innovation Management JIM 2 (1), 9-46. Design Thinking Brown, T. (2008). Design thinking. Harvard Business Review, 86(6), 84-92. Leonard, D., & Rayport, J. (1997). Spark innovation through empathic design. Harvard Business Review, 75(6), 102–13. Lester, R. K., Piore, M. J., & Malek, K. M. (1998). Interpretive management What general managers can learn from design. Harvard Business Review, 76(2), 86-96. Stickdorn, M, & Schneider, J. (2012). This is service design thinking: Basics, tools, cases. New Jersey: John Wiley and Sons.
European Qualifications Framework (EQF) Level	Level 6, 7.

Lecture Content

The lecture has two main modules: (1) a general introduction into individual ambidextrous competences for Open Innovation, and (2) a special case study in design thinking as one of the important problem-solving methods.

Individual ambidextrous competences for Open Innovation

Ambidexterity is usually defined as the ability to develop and utilize new resources and competences (resource exploration) and at the same time make efficient use of already available resources (resource exploitation) (Bledow, Frese, Anderson, Erez, & Farr, 2009).

The findings of numerous empirical and theoretical studies show (cf. Hafkesbrink & Schroll, 2010) that, for opening up the innovation process, especially in the phases of idea generation and design, there is a need for more exploratory forms of organizational design to provide a maximum of

flexibility and knowledge absorption in the innovation process. This includes in particular cultural openness, dynamic adaptability of the structures and processes, IT-support, networking skills, collaboration capability beyond organizational boundaries, and the ability to identify new knowledge and technologies (see Figure 1).

In contrast, for later phases of the open innovation process, rather exploitative forms of organizational design are needed, which ensure efficient exploitation of new knowledge. Thus, product development and production are dependent on reliable and stable organizational structures that are used to retain obligations and routines. In this respect, less the appropriation, but rather the transformation and exploitation of knowledge are central organizational performance factors:

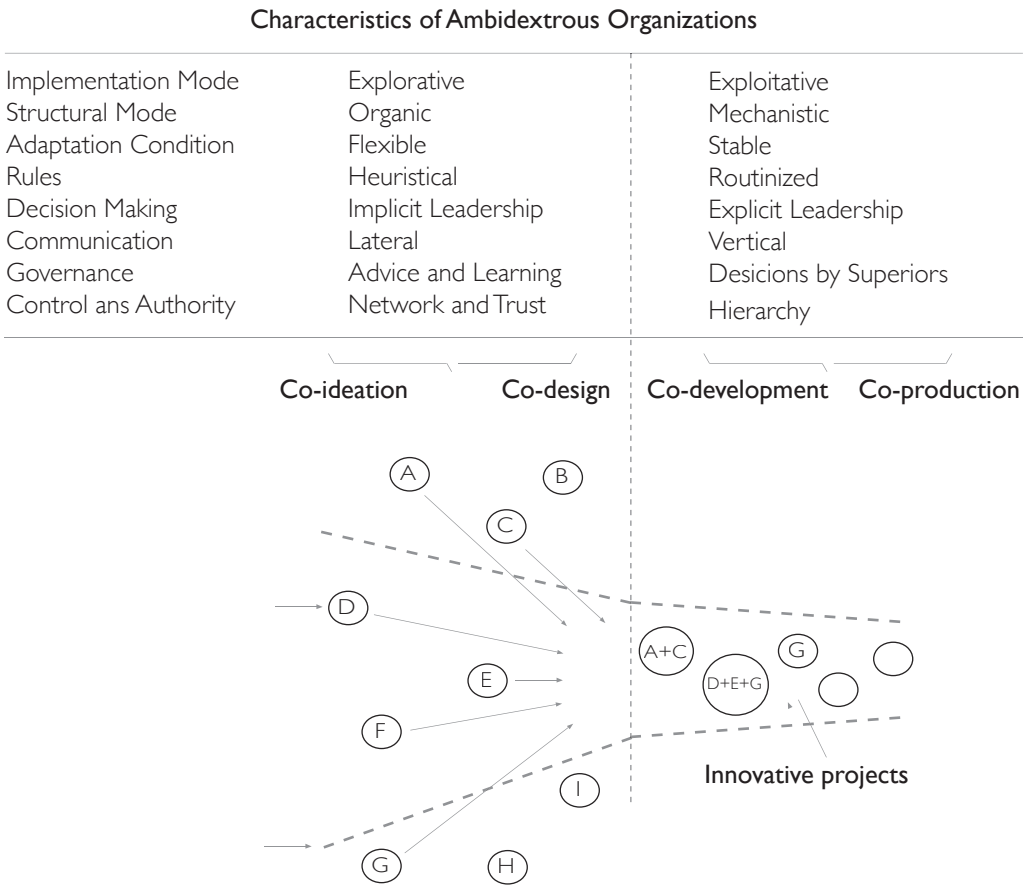

Figure 1. Characteristics of ambidextrous organizations in the OI Process (Source: Hafkesbrink, Bachem & Kulenovic, 2013)

According to the different organizational modes needed for exploration and exploitation, in the debate on individual competencies, also two fundamentally different work situations have to be distinguished (Erpenbeck & von Rosenstiel, 2003).

(1) On the exploration side, it is about divergent self-organized processes with creative, partially or totally open goal attainment situations that often require a deviation from known patterns of action (Wang & Rafiq, 2009). Here, skills are re¬quired that help to enhance variety and effectiveness ("doing the right things"). (2) On the exploitation side, it is about convergent requirement-driven processes, i.e. meeting external requirements in much more familiar, experience-based situations, where it makes sense to build skills that reduce variety and support efficiency orien¬tation.

The core challenges in exploration and exploitation to cope with in OI are displayed in Figure 2. In this sense, individual competencies to cope with ambidextrous challenges of resource exploration and exploitation need to develop:

- combinative and focusing skills in the area of professional competencies
- complexity management and variety reduction skills in the area of methodic competencies
- cooperation and hierarchical skills in the area of social competencies
- self-reflective and authority skills in the area of personal competencies

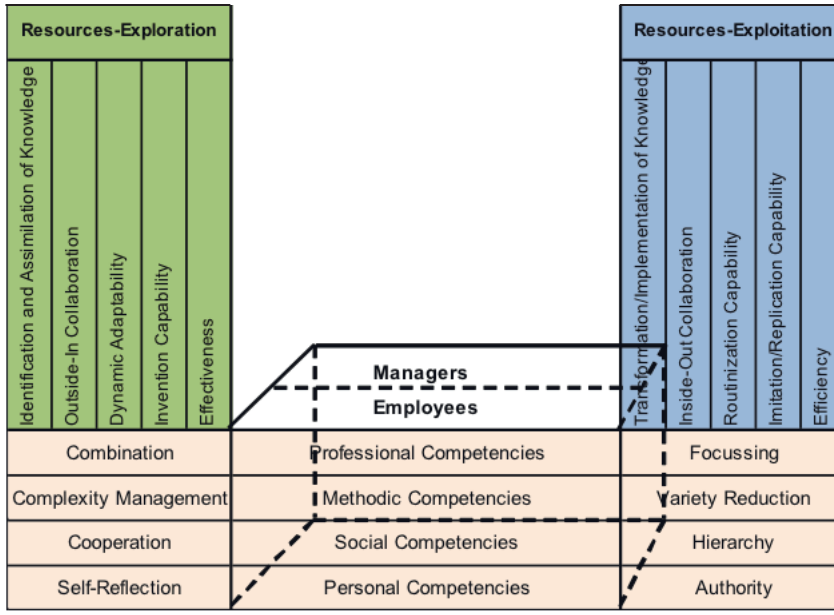

Figure 2. Principal challenges of individual competencies to cope with in exploration and exploitation

In this lecture, these individual competencies will be differentiated by using the dimensions of *professional, methodical, social and personal competencies* (Hafkesbrink & Schroll, 2010).

Professional competencies are those skills that help to cope with typical occupational tasks and requirements based on a self-organized process, i.e. to solve problems creatively with specialist knowledge and to be able to classify and evaluate meaningfully knowledge that is relevant for task fulfillment. Professional competencies are key features in the innovation process, thus also in OI. In resource exploration, it is important to identify and translate new specialist knowledge for the organization's innovation process. There the focus is primarily on access to new knowledge, either in the form of trend reports and market studies (explicit knowledge) or in the form of so-called 'tacit knowledge' (Hess & Rothaermel, 2008), bound to e.g. university research personnel. On the other hand, in resource exploitation it is about en¬riching existing knowledge incrementally with experience along a chosen technology path, with the aim to optimize the expertise based on the existing (business) processes.

On this background, it seems reasonable that broad expertise is beneficial to the exploration process, as diverse knowledge for different domains and tasks is available (Schudy, 2010). In contrast, specialized knowledge is more conducive for exploitation processes, because specialists dispose of very deep knowledge in their own field and can use it effectively to apply knowledge in more or less known situations (ibid).

Methodical competencies are defined as skills to identify, procure, process, store, and use professional knowledge. They serve as a bridge in the innovation process: on the exploration side, methodical skills bridge the process of knowledge identification and knowledge acquisition in relation to external partners. In the transition from exploration to exploitation, methodical skills support the assimilation and transformation of knowledge within the organization, i.e. the translation of existing external knowledge to internally understandable knowledge (ter Wal & Salter 2011; Lane & Lubatkin, 1998).

Methodical competencies for variety enhancement (e.g., *abstraction skills, mastery of different learning techniques, multitasking, mastery of research techniques, design thinking*) support processes of exploration fundamentally, as they are likely to generate new expertise for the organization, as well as enable the transition to a new technology path or business model. By contrast, methodical competencies to support experiential learning (e.g., *coaching, ability to integrate opinions, modeling skills, structured thinking*) rather support processes of exploitation (in the sense of decreasing variety), as incremental improvements in existing processes, products, etc. on the existing technology path or business model are reached.

Social competencies play a supporting role in all stages of the OI exploration and exploitation process, as all related transactions require social-communicative interactions. However, social skills

on their own do not enable either the generation of new information and solutions (Kauffeld, Frieling & Grote, 2002) or the exploitation of existing knowledge. Instead, they only support the exchange of information, serve as the mechanism to understand com¬munication partners and should help to establish necessary social relations that un¬derlie the exploration and exploitation process.

Personal competencies reflect the personality of active players. This competence dimension is the basis for the acquisition of social-communicative, methodological and technical/professional skills. For exploration activities, such personal skills are asked for that put the actor into a learning mode to capture new knowledge. For exploitation activities, such personal skills are conducive to support the application of knowledge in the context of a known issue.

Studies on the competence of innovation staff in *knowledge exploration and invention* (Kaltenegger 2008) highlight the following personal skills:

- Creativity, initiative, commitment, curiosity, flexibility, frustration tolerance, value orientation, spontaneity, and discipline in the implementation (op.cit., p. 109),
- Self-reflection, openness to experience (e.g. active imagination, independent thinking, curiosity) (Barrick & Mount, 1991; Costa & McCrae, 1992),
- Aesthetic appreciation, varied interests, appeal through complexity, high energy, independent judgment, autonomy, intuition, self-confidence, conflict resolution, etc. (Barron & Harrington, 1981; Comacchio & Bonesso, 2011, p. 5).

During the phases of *knowledge exploitation and implementation*, the share of creativity, personality, and variety enhancing personal competencies may be lower, since such personal competences are in demand that focus on routines, such as *authority, assertiveness/persistence/persistence, patience, strength of character (advocacy of beliefs), ambition, accuracy, punctuality, diligence, execution, and reliability.*

To summarize:

For individual competencies that support e*xploration activitie*s, attributes are needed that are directed at:

- combining and expanding knowledge (professional skills),
- coping with complexity in the context of variety enhancement (methodical skills),
- cooperation in the framework of interaction relationships (social skills)
- self-reflection in personal action routines (personal skills).

For individual competencies that support exploitation activities, the attributes should focus on

- knowledge concentration (professional skills),

- simplification and narrowing of variety (methodical skills),
- hierarchy for control of work processes (social skills),
- authority in the implementation of personal action (personal skills).

Innovation actors must deal regularly with the inherent tensions between these properties, especially in OI processes. The question is whether the ambidextrous skills are available that resolve these tensions, or at least pair together those complementary skills that are able to reduce the tensions and make them manageable.

Based on our analysis, Figure 3 displays the relevant me¬thodical, social and personal competencies along the dichotomic axes of exploration and exploitation:

- To accomplish the day-to-day work and innovation tasks, certain constitutive interdisciplinary competencies must exist, such as patience, stress-resistance, self-confidence, emotional stability, etc. These competencies provide the basic enabling levers for acquiring social and methodical competences for exploration and exploitation (Quadrant I).

- Interdisciplinary exploitation competencies (1st order competencies) serve as a lever to reduce variances with the aim of best possible exploiting of existing professional knowledge. These are e.g. process management skills, time management skills, adaptive learning skills, timeliness, diligence etc. They provide the ground for incremental improvements of existing processes and for routinizing business models (Quadrant II).

- Interdisciplinary exploration competencies (1st order competencies) serve as a lever to enhance variance with the aim of exploring new potentials and professional competences. These are e.g. creativity, openness, generative learning, transformational leadership, reorganization capabilities, etc. They serve as a basis for (radical) innovation processes (Quadrant III).

- Ambidextrous interdisciplinary competences (2nd order (meta-) competences) serve as a lever to solve role conflicts in balancing exploration and exploitation processes. These are e.g. dialectic (relativistic) thinking/trade-off or synthesis thinking, emotional ambivalence, knowledge brokerage, topsy-turvy thinking, paradoxical cognition etc. (Quadrant IV).

We assume for all individual interdisciplinary competencies that the development re¬quirements of these competencies do not alter significantly as the size of the organization changes, but we consider – as a result of SMEs' scarce resources – that SME managers and employees have to play more complex hybrid or ambidextrous roles in day-to-day business and in innovation compared to large companies (cf. Hafkesbrink, Bachem & Kulenovic, 2013).

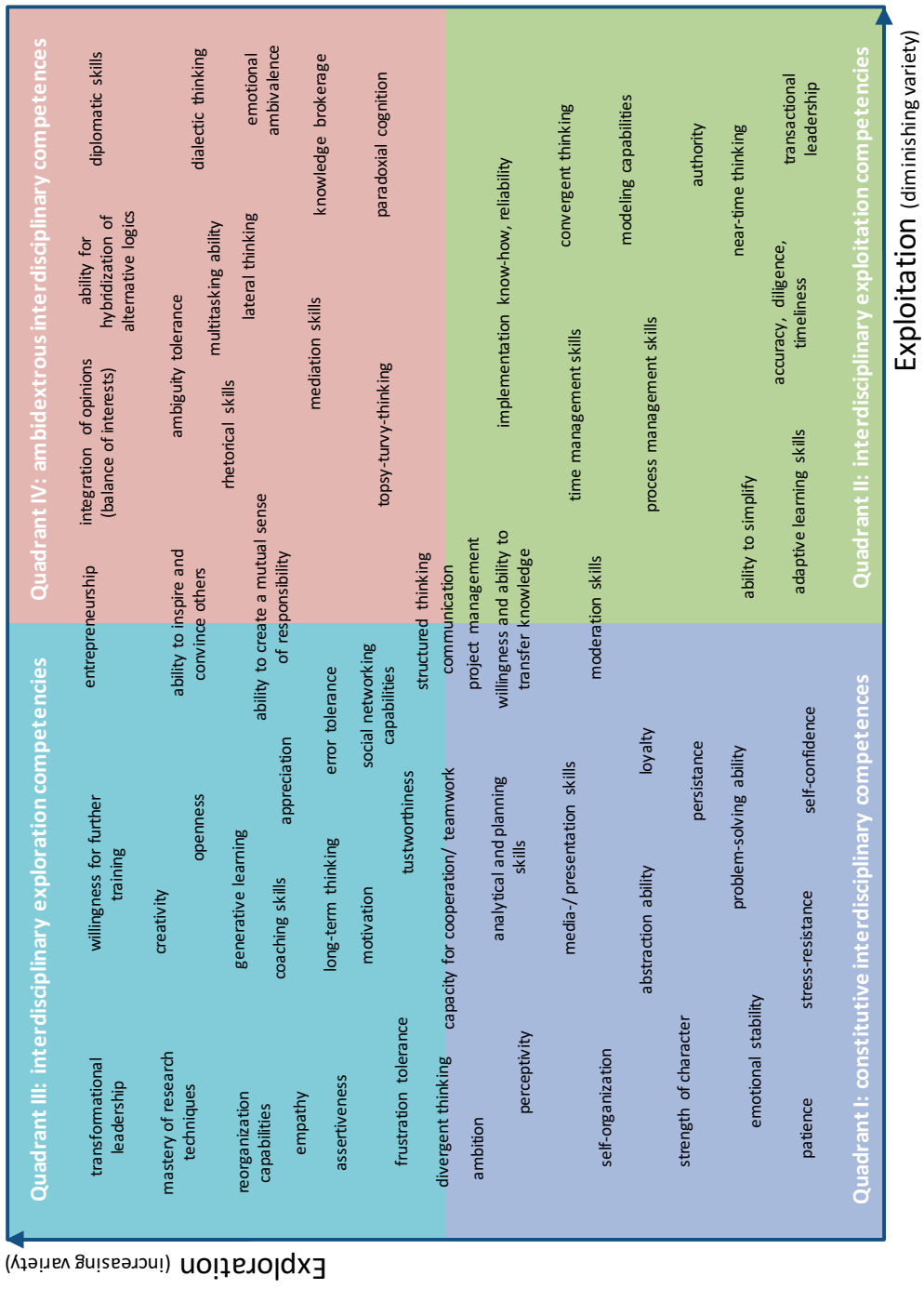

Figure 3. Individual interdisciplinary and ambidextrous competencies (Hafkesbrink & Schroll, 2014)

Design Thinking Case Study

Design thinking is a problem-solving methodology, "a human-centered innovation process that emphasizes observation, collaboration, fast learning, visualization of ideas, rapid concept prototyping, and concurrent business analysis" (Lockwood, 2009, p. xi). Design thinking strongly relies on practice, and many often describe it as "what designers do", referring to design methods and tools (Kimbell, 2012). The main objective is to create a new emotionally and functionally appealing user experience (Seidel & Fixson, 2013, Liedtka, 2014). Applying design thinking thus means focusing on users and user needs and requires an iterative process that continuously goes from observation of users to idea generation and testing (Brown, 2008).

Glen et al. (2015) provide a practical guidance for teaching design thinking in business schools. They outline six main phases of the design thinking project: problem finding, observation, visualization and sense making, ideation, prototyping, and viability testing. The authors recommend planning the teaching with respect to these phases. Thus, students should start with problem finding and developing an initial problem statement, even if they feel discomfort when dealing with ill-defined tasks. Next, students have to learn how to form empathy for the end user. This is the core of design thinking and relies predominantly on direct observation and interviews with users. Students then try to visualize and make sense of the data. Several techniques are available, including customer journeys, personas, and empathy maps. This becomes an input for ideation, which takes form of brainstorming within cross-functional teams; in the case of students, the goal is to create diverse teams. The ideas are further prototyped and tested, using, for example, customer journey mapping, user scenarios, storyboarding, desktop walkthrough, and experience prototyping. Finally, the prototyped idea gets through viability testing, when students gather feedback on the desirability and feasibility of the suggested solutions.

Research shows that an action-based entrepreneurship training can make participants more skilful in identifying business opportunities (DeTienne & Chandler, 2004; Gielnik et al., 2015) and more entrepreneurial (Glaub, Frese, Fischer, & Hoppe, 2014; Rauch & Hulsink, 2015). We build our teaching (the combination of a lecture and a workshop) on the principles of action-based training with the aim to develop students' innovation competences and skills. By increasing the students' understanding of what design thinking is and how to apply the basic design thinking tools, we expect that students will become better in sensing market opportunities as they become more attentive to consumer needs and more capable of designing new solutions as they learn techniques for idea generation and testing. Not the least, it also contributes to improving the ability to work through the innovation process as it focuses on collaboration and communication during teamwork.

The content requires a 2-days teaching, consisting of a 2-hour introductory lecture and 4-hour workshop on the first day, and 3-hours workshop and 1-hour session with group presentations on

the second day. The introductory lecture includes the presentation of design thinking and the design thinking tools with the focus on interviewing, customer journey mapping, brainstorming, collaboration, scenarios, and experience prototyping. Some examples of the successful implementation of design thinking may be used (e.g., Yoo & Kim, 2015). The lecture should also include the discussion of challenges of applying design thinking in corporations (e.g., Kolko, 2015). In turn, the workshop relies on a teamwork with an ill-defined problem and a real customer, implies active use of the design thinking tools, and finishes with the presentation of ideas in front of other students to get feedback. A teacher and – if there are many groups – assistants, who have knowledge of design thinking, should facilitate the workshop in its full duration.

Pedagogical guidelines

It is up for a teacher to choose an experience to be designed, but it should be sufficiently easy for students to relate to (e.g., banking, public transportation). We use an example of shopping experience.

As a part of preparation for a class, the teacher agrees with two external persons on the participation in the training as customers (for example, students from another course). The customers should represent two competing shops/chains. A short general description of each person should be prepared, containing information about age, occupation, lifestyle, family, and interests. No obvious problem should be defined, but the person's shopping habits should receive a sufficient attention. In addition, the teacher prepares a general information about the shops (a short history, existing products/services).

After the introductory lecture, a teacher primes students into being representatives of particular departments (IT, customer service, seller, etc.) of one of the two shops. As a result, a teacher gets two groups (two companies) with the similar functional structure. Students then receive the general information about the corresponding company. In addition, they get 45 minutes to interview the relevant customer. Next, the teacher mixes students into "cross-functional groups" of 5-7 people (different functional roles, but from the same company), and the group work starts. Each cross-functional group should have sufficient space (better if they have each own group room), and the supply of auxiliary materials, such as marker pens and post-it of various colours, large paper sheets, and an example of a customer journey canvas. Then the ideation phase begins, when students brainstorm their ideas and visualize them. Customers should be available to the groups, regularly visiting them and asking whether they have new questions or want to discuss their ideas. The teacher with eventual assistants should also be available for the groups, continuously facilitating the workshop. As the outcome of the day 1, the groups should produce scenarios for their ideas (the detailed description of an imaginary customer experience with their new product/service).

Glen et al. (2015, p. 190-191) provide the detailed overview of challenges and solutions related to the facilitation of design thinking workshops. For each of the six main phases of the design thinking project, they describe challenges and the ways of handling them. The continuous encouragement of students, non-intrusive supervision, help, and the nourishment of their holistic perspective are the authors' key advises to teachers.

On the second day, students meet in two groups ("companies") according to the original division and discuss the feasibility of the ideas from the day 1 (1 hour). The cross-functional groups present their ideas by using scenarios and storytelling. Each "company" chooses the most feasible idea from their point of view. During the next two hours of the workshop, the companies finalize these ideas and prepare a presentation to the teacher and customers.

Evaluation questions

The last hour of the two-day session is devoted to the "companies'" presentation of ideas in the form of experience prototyping. In prototyping, students may resort to roleplay. In addition, they may use additional material (carton, paper, various objects) if they need it. They then get feedback from the teacher and customers with respect to desirability of the solutions. It is, however, important to continuously stress that it is OK to fail and make mistakes during the ideation and prototyping. The final feedback should be constructive and not negative. If a teacher finds it relevant, it is possible to organize it in the form of a competition, when a group, whose suggestion the teacher and the customers will evaluate as the most desirable, gets a prize. Teacher might decide to discuss the implementation strategies for each of the ideas.

Teaching tips

Teacher might use the examples of a persona (the fictional description of a customer) to demonstrate how the description of a real customer can be organized).

KEY TAKE-AWAYS

• Be aware of different individual competences needed for exploration and exploitation of knowledge in the Open Innovation process. On the exploration side, it is about divergent self-organized processes with creative, partially or totally open goal attainment situations that often require deviation from known patterns of action (Wang & Rafiq 2009). Here, skills are re-quired that help to enhance variety and effectiveness ("doing the right things"). On the exploitation side, it is about convergent requirement-driven processes, i.e. to meet external requirements in much

more familiar, experience-based situations, where it makes sense to build skills that reduce variety and support efficiency orientation.

• In that sense individual competencies to cope with ambidextrous challenges of resources exploration and exploitation need to develop both

combinative and focusing skills in the area of professional competencies
complexity management and variety reduction skills in the area of methodic competencies
cooperation and hierarchical skills in the area of social competencies
self-reflective and authority skills in the area of personal competencies.

• A Design Thinking exercise will make students better in sensing market opportunities, as they will become more attentive to consumer needs and more capable of designing new solutions when learning techniques for idea generation and testing. Not the least, it also contributes to improving the ability to work through the innovation process, as it focuses on collaboration and communication during teamwork.

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