

ENGineering and INdustry Innovative Training for Engineers (ENGINITE)

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A3 course

Innovation, Entrepreneurial and Intrapreneurial skills

Prepared by GrantXpert Consulting



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Contents

1.	Part A – General Information	.3
2.	Part B - Module overview & key learning outcomes	.4
3.	Part C – Problem based learning scenario	.6
4.	Part D - Pre-module preparation	.7
5.	Part E - Module overall presentation	.9
6.	Part F - Post module-Post training	33



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1. Part A – General Information

Title: Innovation, Entrepreneurial and Intrapreneurial Skills

Keywords: leadership, creativity, team work, interpersonal skills, entrepreneurship, innovation, innovation management

Authors: Christina Achilleos, Dr. Celia Hadjihristodoulou, Dr. Stephanie Apserou

Duration: 1 day online reading/study on Google Classroom and 1 week f2f

Language of material: English and Greek

Type and number of sessions:

-online session day 1 (2.5 hours session): Introduction to ENGINITE and PBL, ice-breaking activities, introduction to the problem

-online session day 2 (2.5 hours session): Case study discussion, asking the group questions of what they think their real task is. No straight answers will be provided by the tutor.

- f2f day 1 (2.5-hours session): presentation of the problem, grouping, setting the contract of the team's learning and exchange mode, code of ethics, identification of learning issues within the groups, class-wide discussion of learning issues. Session 1 theory presentation. Completion of the BMC V1.

- f2f day 2 (2.5hours session): group work, interviewing process, progressing on learning issues and solutions, Session 2 theory presentation. Completion of the BMC V2.

- f2f day 3 (2.5-hours session): interviewing process, reflection time, Session 3 theory presentation. Completion of the BMC V3.

- f2f day 4 (2.5-hours session): possible industry leader visit and discussion with the group, teams present their progress to the tutor, interexchange between the group members, Session 4 presentation. Completion of the BMC V4.

- f2f day 5 (2.5-hours session): module overview presentation the PBL way, interviews with the group, Completion of the final BMC V5.

Number of participating engineers: 20-25 young engineers

Group's setting: Mixed gender, multidisciplinary groups of engineers, 5-7 members in each (per guidelines of PBL literature)



2. Part B - Module overview & key learning outcomes

Overview: The course aims to introduce young engineers to the concept of Innovation, and particularly in understanding how to manage innovation under the creative process of creating new innovative products/services, or participating effectively in corporate innovative processes. Upon completion of the course, young engineers will have explored the necessary Entrepreneurial and Intrapreneurial skills and capabilities essential to enable them to successfully participate in or lead complex projects with tight schedules, limited resources, yet at the same time with high quality results. The parameters of the real-world industrial workplaces are constantly changing, hence problems need to be overcome; thus, young engineers need to be properly trained. For this purpose, this course will prepare the engineers to solve their everyday work challenges with an entrepreneurial zest! The course is applicable to young engineers who will either run their own business or work for another business. Given the opportunity to address real industry cases in combination with the infused Problem Based Learning (PBL) approach which will be used during the course, it is expected that engineers will gain the desired innovation and entrepreneurial skillset. Creative and critical thinking skills, understanding leadership and adopting effective innovation culture, embracing creative processes that lead to new innovative products/services/processes, self-management and teamwork skillset, applying proven business models to boost innovation, along with a holistic grasp of the project-at-hand are just some of the capabilities that engineers need and will acquire through this course. Good practices and live talk sessions from industry leaders will also be available as participants' tools.

Key learning outcomes:

Upon completion of the course, participants should be able to:

- Understand the concept of Innovation, particularly Innovation Management
- Enable young engineers to develop their analytical skills through introducing them to a real innovation management design project



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- Enable young engineers develop critical thinking and insight to improve their effectiveness as engineers working with solving real work problems
- Enhance entrepreneurial and intrapreneurial knowledge and skills through theoretical and practical application either by working on cases individually or in teams
- Recognise the key drivers of innovation and understand the critical role of effective leadership
- Strategise about how to create an organisational culture to support innovation
- Understand how innovation fits the Business Model Canvas, and how essential it is for effective Innovation Management

*At the end of the course, each participant will have the opportunity to create their personal list of entrepreneurial skills needed to cope within an ever changing innovative and complex industry. Therefore, trainees will have the opportunity -after being exposed to the course material and exercises- to think creatively and derive to their own skillset, which will be a proof of how they have indulged to critical thinking introduced to them.





3. Part C – Problem based learning scenario



You are expected to create a new breakthrough innovation and **convince** a group of investors on why they need to invest in your idea over other ideas.

Expect to be challenged! You are required to create a solid presentation addressing the problem to a group of investors. You are encouraged to use the BMC when analysing this problem and present meaningful and insightful data.







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4. Part D - Pre-module preparation

Background information (examples of industry trends on innovation)

Market products:

https://www.techadvisor.co.uk/feature/digital-home/best-robots-2018-3652561/

https://www.fullydroned.com/best-robot-toys/

http://medicalfuturist.com/kid-will-play-friends-learn-vr-teachers/

Market need links:

https://blog.ozobot.com/2018/04/10/competitions-tech-fairs-and-maker-fests-for-inventors-

and-robotics-hobbyists/

https://www.microsoft.com/inculture/digital-inclusion/unified-robotics/

Further readings:

https://www.boardofinnovation.com/blog/2017/01/05/100-sources-that-every-innovation-

professional-should-know-about/

www.steveblank.com/category/lean-launchpad/

Adair, J. (2009). Leadership for innovation. London: Kogan Page.

Davis K. (1977). Human Behavior at Work Organizational Behavior. McGraw Hill

Drucker, P. and Maciariello, J. (2015). *Innovation and entrepreneurship*. Oxfordshire, England: Routledge Classics.

Fisk, P. (2011). *Creative genius*. Chichester: Capstone.

Gassmann, O., Frankenberger, K. and Csik, M. (2014). *The business model navigator*. Harlow [etc.]: Pearson Education.

Green, K. (2014), Creative-thinking exercises for entrepreneurship class. *Journal of Business Cases and Applications*. 12, pp.1-10

Robbins S. P., *Organizational Behavior*. Prentice Hall, latest edition New Jersey: Pearson international, latest edition



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Case study additional material

You are strongly encouraged to approach the business model canvas to provide meaningful answers to the problem assigned to you – read the below sources well:

Download the Business Model Canvas here:

https://canvanizer.com/downloads/business model canvas poster.pdf

Download the Value Proposition Canvas here:

http://www.businessmodelgeneration.com/downloads/value proposition canvas.pdf

Further important case study readings:

1) <u>http://designabetterbusiness.com/2017/11/02/how-to-use-the-business-model-canvas-</u>

for-innovation/

- 2) <u>http://www.innovation-portal.info/toolkits/business-model-innovation/</u>
- 3) <u>http://www.innovationtactics.com/business-model-canvas-airbnb/</u>
- 4) <u>https://rbgn.fecap.br/RBGN/article/viewFile/1812/pdf_88</u>
- 5) <u>https://www.altexsoft.com/blog/business/using-business-model-canvas-to-launch-a-</u>

technology-startup-or-improve-established-operating-model/

https://archive.harvardbusiness.org/cla/web/pl/product.seam?c=25903&i=25905&cs=f85785d 3580feb87e2bce1535af10c2f





5. Part E - Module overall presentation







Session 1: Personal skills







Page 10



Entrepreneurial mindset. What is it?









Practical exercise

The envelope game - Get ready for some ACTION!



Entrepreneurs are leaders at heart!

Entrepreneurs are leaders willing to take risk and exercise initiative, taking advantage of market opportunities by planning, organizing, and employing resources, often by innovating new or improving existing products.





Page 12



Are you SANTA or an ELF?

Santa:

Entrepreneurship requires managing a wide variety of tasks as part of the business, from marketing and accounting to training, customer service and more. Can you wear multiple hats, as Santa does with Christmas, or do you prefer to be the elf that loves to execute specific tasks? Do you take initiative or do you want clear instructions? Santas make better entrepreneurs than elves do.







Questions are tough but so are you

Before you think you are an entrepreneur ask yourself:

- 1) What is your relationship with money?
- 2) Are you comfortable 'flying' blind?
- 3) Are you ready to commit?
- 4) Were you born for business?
- 5) Do you like to work with other people?

If you think you have what it takes to be an entrepreneur take this quiz to measure your entrepreneurship IQ.

Take this quiz: https://www.entrepreneur.com/article/247560







ENGINITE: A2 course

Risk is a constant variable



Skills yes, Passion OH YES!









Video: Entrepreneurship is the EXIT!







Page 16



Session 2: Teamwork







Page 17



What makes up a good team?







COMMISSION CANNOT BE HELD RESPONSIBLE FOR ANY USE WHICH MAY BE MADE OFTHE INFORMATION CONTAINED THEREIN

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Page 18



Action time – Frostbite







Page 19





Team work resistance vs. team work motivation



The ideal team player







Game-No communication, no team.







Page 21



Team building for innovation

Innovation Team Process

- Self organize (you create the process)
- Brainstorm and collaborate (all ideas count)
- Meet in person whenever possible
- Dedicate at least 20 focused hours per week (ideally 100%)
- Publicize progress (weekly status)
- Time box problems/solutions
- Seek out subject matter experts (SME's) as needed
- Meet with your advisory board frequently
- Plan for small, frequent wins (eventually they will snowball into bigger wins)

What do you think are some typical team problems?



- Do too much, too soon
- Conflicts over differences in work styles and personalities
- Too much emphasis on results
- Not enough emphasis on group dynamics, and team synthesis
- Unanticipated obstacles causes teams to give up
- Resistance to do things differently
- Lack of trust
- Lack of respect to team members
- Lack of respect to team's coherence
- Poor time vs. tasks allocation which causes missing deadlines





Never forget ↓

HIGH PERFORMING TEAMS

HAVE CRYSTAL CLEAR ROLES

Session 3:BMC

The Lean Startup: Evidence based Entrepreneurship

The BMC:







Form in teams on your own

Use the BMC to solve the problem assigned to you early on in this module

Each team is requested to create multiple versions of the BMC in order to track progress on solving the assigned problem. This will create a dynamic procedure amongst the team, which will show them how they advance, where they started and where they are heading.

In class exercise for all teams

Please answer each question and submit it back to your mentor: (100 words per question please) -Value proposition: What aspect of defining the Value Proposition for your project did you find the most difficult? Why? -Customer segments: Which of your project's Customer segments do you think it will be easier to validate? Why? -Channels: Select a channel of distribution and list 3 strong benefits and 3 strong challenges. Are you inclined to use these channels? Why?





In class exercise for all teams

Please answer each question and submit it back to your mentor: (100 words per question please)

-Revenue streams: List 5 different possible revenue models for your project. Which do you prefer? Why?

-Key partners: What are the most important things you need from partners? Why?

-Key resources/activities: What is or will be your project's core competency? Is it vital to providing the Value proposition? Why? -Cost structure: Identify 3 strategies for decreasing front-end fixed costs. What are the implications for each strategy?

Progress reporting

Please submit answers to your mentor at the end of each session (both online and f2f) as per below:

Hypothesis: Here's what we Thought Experiments: Here's what we Did Results: Here's what we Found Action: Here's what we are Going to Do Next

*Each team will present their answers orally and will expect questions from all the group









Innovation management is a combination of the management of innovation processes, and change management. It refers both to product, business process, and organizational innovation.

What makes a good innovative team

A variety of studies have shown that diverse teams are smarter, more creative, and examine facts more thoroughly.
The truth is you don't need the best people — you need the best teams. The problems we face today are far too complex to be solved by a lone genius working in isolation. That's why the best innovators tend to be knowledge brokers, who embed themselves into networks so that they can access that one elusive piece of insight that can crack a tough problem.





What makes a good innovative team

- Hire people interested in the problems you need to solve. If there is a true commitment to a shared mission, the ideas will come.

-Teams in which people speak in roughly equal amounts far outperform those in which one or two people dominate the conversation. So those mercurial Steve Jobs types who are spouting off ideas so often that nobody can get a word in may in fact be killing innovation.

What is innovation management?

Put simply, management innovation changes how managers do what they do. And what do managers do?

Typically, managerial work includes:

- Setting goals and laying out plans;
- Motivating and aligning effort;
- Coordinating and controlling activities;
- Accumulating and allocating resources;
- Acquiring and applying knowledge;
- Building and nurturing relationships;
- Identifying and developing talent;
- Understanding and balancing the demands of outside constituencies.





Innovation managers tend to:

- Commit to a bigger problem: The bigger the problem, the bigger the opportunity for innovation. While big problems don't always produce big breakthroughs, little problems never do.
- Search for new principles: Any problem that is pervasive, persistent, or unprecedented is unlikely to be solved with hand-me-down principles. Novel problems demand novel principles.

Innovation managers tend to:

- Exploit the power of analogy: Leadership is not defined by the exercise of power but by the capacity to increase the sense of power among those who are led. The most essential work of the leader is to create more leaders.
- Indulge in invention & discovery: In a world swarming with new management challenges, you'll need to be even more inventive and less tradition bound than all those management pioneers who came before you. If you succeed, your legacy of management innovation will be no less illustrious than theirs.





The role of leadership in innovation management



Video: The 4 behaviors of innovative leaders





Page 29



Activity – Innovation Management

-You are provided with pens, pencils, paper, post-it notes, and markers.

-You are required to come up with your team with a single innovative solution using all of the above material.

-Explain who will use this new solution, why it is innovative, where will you sell it, value proposition, price, how will you promote it.

-Assign roles. Assign a leader.

-Elaborate how you worked with your team during presenting your solution!

The sun-care products challenge

Gather together with your team. You have 1H to think of alternative uses of sun-care products. Define the need clearly. Present your ideas in front of everyone and highlight the challenges you faced under this creative thinking process. Useful guidelines:

-Make a timely plan of how to go about solving the challenge

-Assign tasks and roles

-Research before your brainstorm

-Brainstorm

-Find the competitive edges of your ideas





Pay attention to the Innovation Funnel







Page 31



Innovation Management





Page 32

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6. Part F - Post module-Post training

Two individual reports will need to be delivered:

- 1) Group report
- 2) Personal report per participant

1) Group report

Participants are expected to complete a group report which highlights **the process** they followed when aiming to solve the given problem.

The report should particularly make reference to the below:

- Presenting a number of alternatives (solutions) that meet the problem.
- Presenting a number of advantages and disadvantages of each alternative.
- Choosing an optimal solution based on technological, economic and environmental considerations, as well as logical work time frameworks and anticipated difficulties.

Participants will present these reports in front of the group.

2) Personal report per participant

Each participant is required to submit a personal report. The participants are instructed to refer to the following points: a general description of the processes occurring in the group, what happened to the participant while working with the team; the construction and formation stages of the team; what was the unique contribution of the participant to the team; what did the others in the team contribute to the participant, major benefits earned in the module to be used further in the participants' career. Furthermore, the participants are requested to answer two questions: 1) in light of your experience in the module, what are the advantages and disadvantages of learning through problem-based projects? 2) Will you incorporate this approach in your learning style in the future?



Assessment criteria

Dimension	Criteria
Defining the problem /	The problem was clearly and unambiguously stated by the participants per
formulating the need for	PBL approach.
the innovative solution.	
Defining the new	The new innovative solution objectives are clearly defined, are compatible
innovative solution	with the problem definition and are attainable. Trainers guided and
requirements.	interviewed participants successfully towards this purpose.
Theoretical scientific-	The team has conducted sufficient research to support the project (problem
technological background	assigned to them). All information is clear, appropriate and correct. Covers
needed for the project.	topic completely and in depth. Information includes scientific, technological
	and social aspects relevant to the project.
Use of business models	The team has accomplished sufficient use of the business models provided
(BMC)	to them and has exemplified their use and value throughout the module.
Project planning per PBL	Participants have included in their project planning:
approach to solving a	-a number of alternatives (solutions) that meet the problem.
problem.	- a number of advantages and disadvantages of each alternative.
	- an optimal solution based on technological, economic and environmental
	considerations, as well as schedules and anticipated difficulties.
Soft skills.	Participants positively approached group exercises and games aiming to
	exercise leadership, innovation, entrepreneurial and intrapreneurial skills
	and have listed effectively the characteristics of entrepreneurs and
	intrapreneurs in f2f sessions. In session-interviews should have already
	directed the trainer to the level of understanding and absorbing this
	knowledge by the participants. Individual participant reports should also
	imply soft skills obtained.
References.	Complete list of all sources used as part of the PBL approach that assigns
	the responsibility to the participants to find their own sources of
	knowledge.
Documentation of the	The documentation includes importantly the BMC versions that the team



Page 34



project stages.	needs to complete consistently throughout the module, and final group and
	individual participant reports.





Consortium

This document has been produced by the consortium of the ENGINITE project

