

Open Innovation Platform  
University - Enterprise  
Collaboration

# Implementation of Flipped classroom in an intensive TRIZ\* course

## Systematic Creativity and Inventive Thinking

JURE Conference, Tampere  
August 26-29, 2017

Iuliia Shnai

Lappeenranta University of Technology

Co-funded by the  
Erasmus+ Programme  
of the European Union



# Table of Contents

1. Introduction to Flipped classroom
2. Doctoral research and Current study
3. Theoretical background
4. Course redesign: Methods and Elements
5. Data gathering
6. Results and discussion
  - 6.1. Attitude
  - 6.2. Workload
7. Conclusions and recommendations



# Flipped classroom

JURE Conference in Tampere, August 26-29, 2017

OIPEC

# Doctoral study

Transition to flipped classroom within different initial conditions



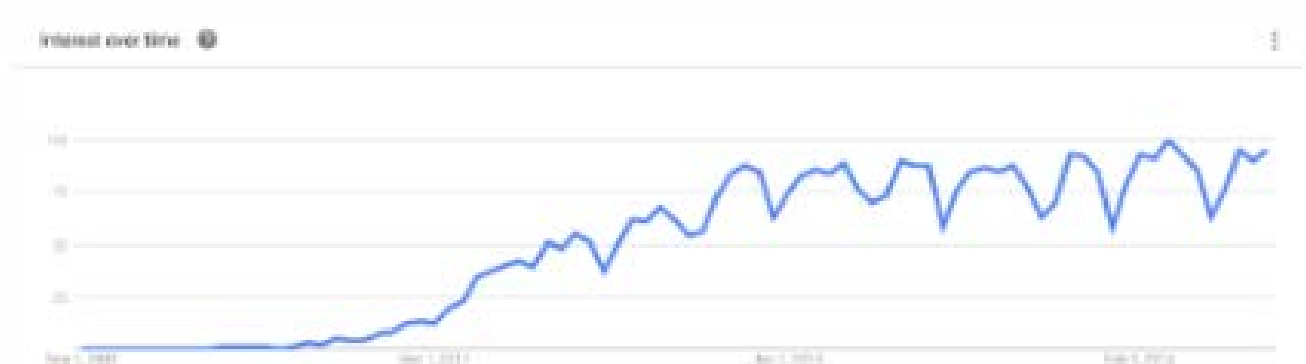
Algorithm provided for implementers to make preliminary estimations of the resources and other conditions beforehand to improve and simplify the process of courses development

**Aim of this paper** is to study the flipped classroom implementation effect on intensive TRIZ course from **perception** and **workload** perspective from both students and teacher

# Trends and theoretical background

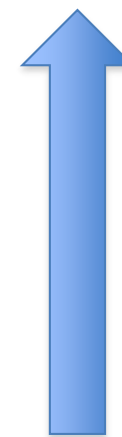
- Student's perception
- Workload
- Professor's barriers
- Professor's time-investments

## Google Trends



## Scopus Papers

2017- 235  
2016 -460  
2015 - 422  
2014 - 185  
2013 -79  
2012 -14



# Systematic creativity and Inventive problem solving (TRIZ)

- Summer school intensive course (since 2011) and winter school intensive course (since 2016) 78 hours = 3 credits
- Amount of participants : approx. 40
- Fields of study: Engineering and management

# Course re-design and implementation

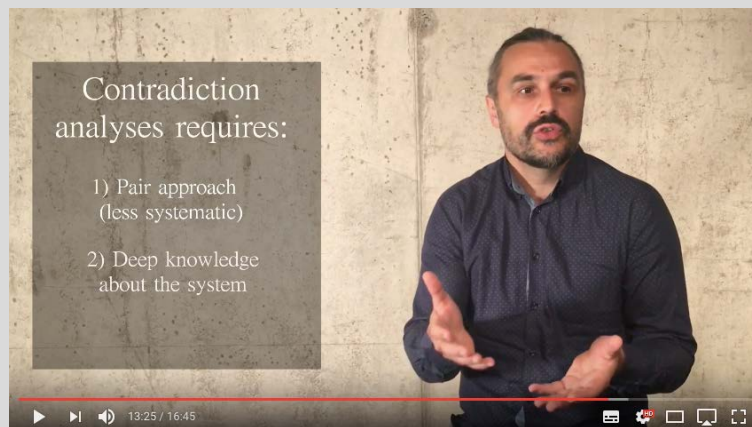
Systematic creativity- TRIZ basics (78 hour in total)

	Before	In			After
<b>Traditional course</b> Summer and winter school 2015		Lectures with exercises 24 hours	Team and project work 20 hours	Project presentations 8 hours	Independent work 26 hours
<b>Partly flipped course</b> Summer school 2016	Video preparation 3-4 hours	Lectures with exercises 20 hours	Project work (in groups) 20 hours	Project presentations 8 hours	Independent work 26 hours
<b>Partly flipped course</b> Winter school 2016	E-learning platform preparation 6-7 hours	Lectures with exercises 20 hours	Project work (in groups) 20 hours	Project presentations 8 hours	Independent work 26 hours



# Blended elements

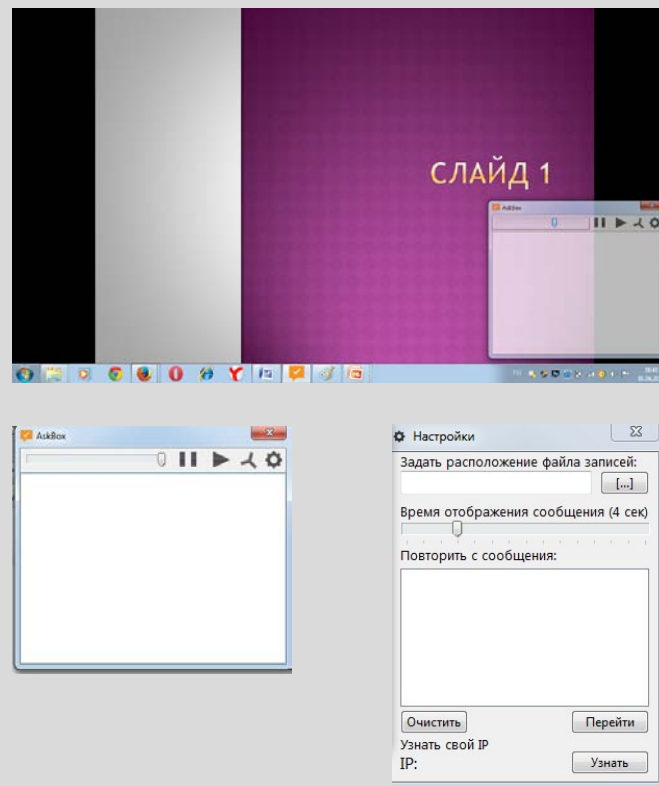
## Videos



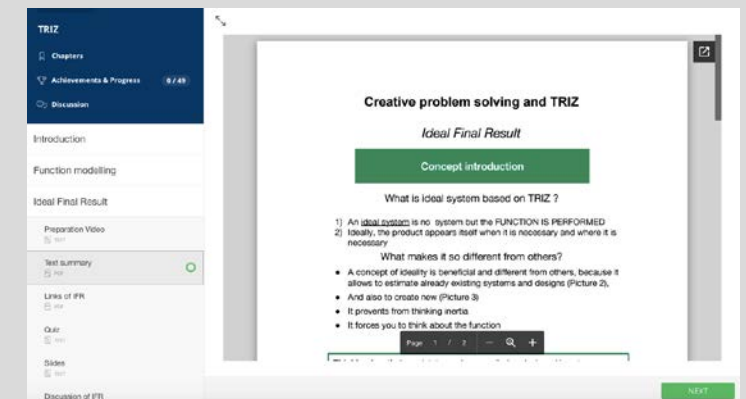
Video on camera  
Text-overlay video

[Link to videos](#)

## Activation feedback system



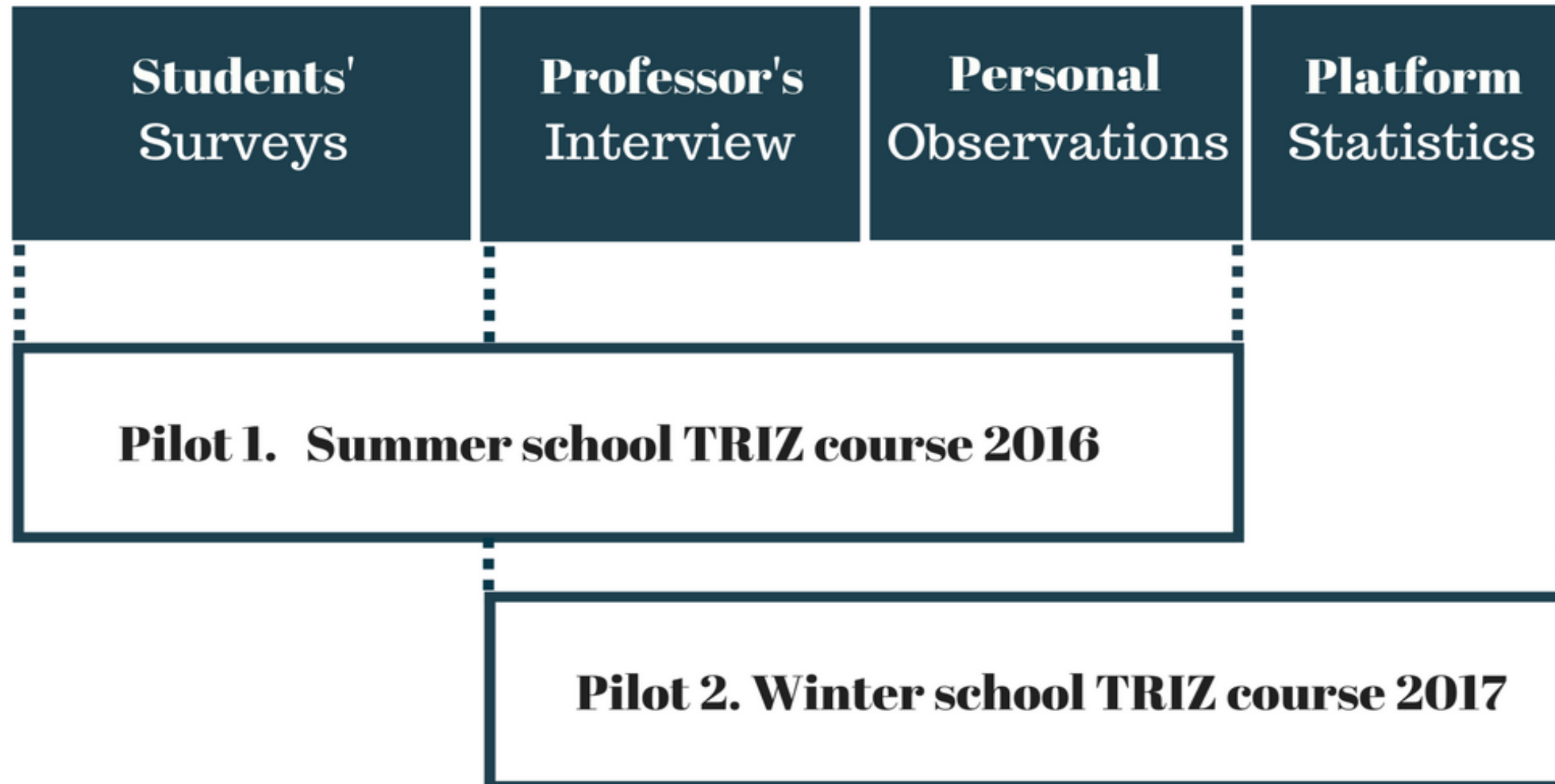
## E-learning open platform



[Link to platform](#)



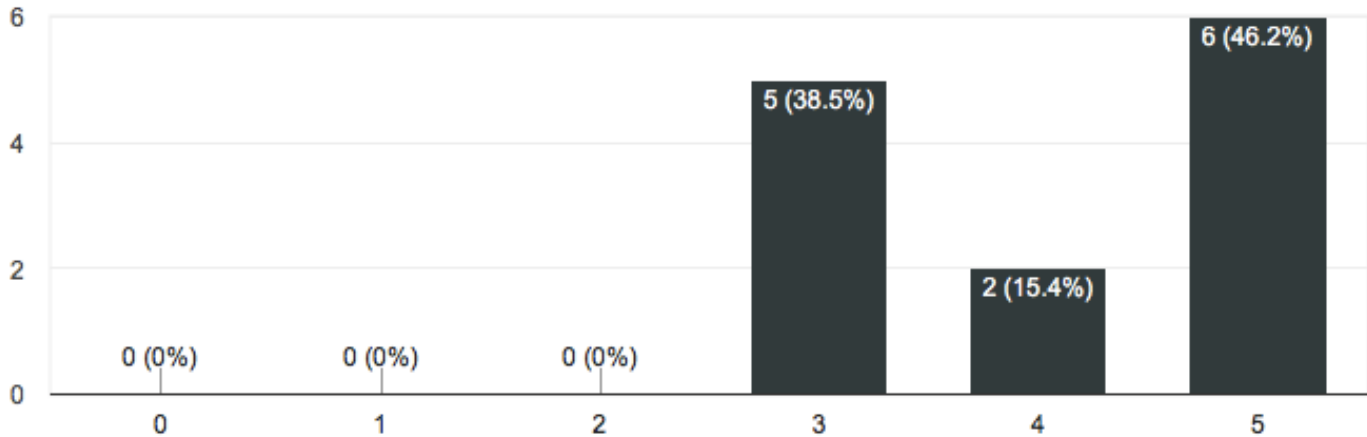
# Data Gathering



# Results: Video configuration and Frequency of the video use

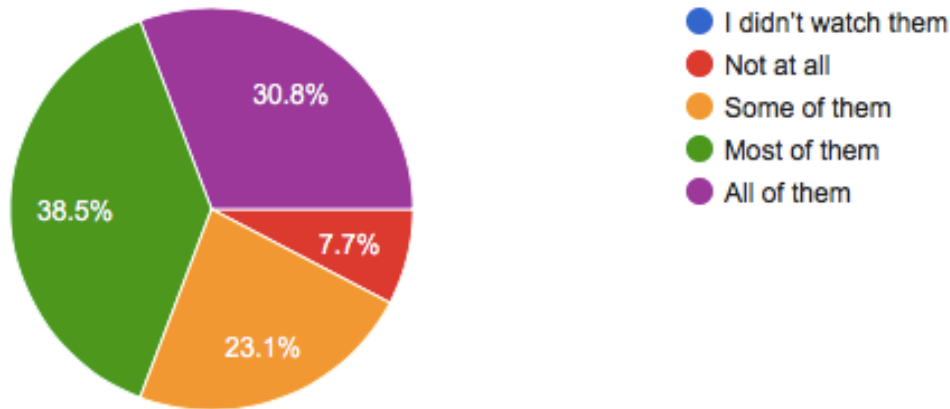
1.1. In the first week of the summer school, I sent you 5 videos. How many videos were you able to watch?

13 responses



2. Did you watch them fully?

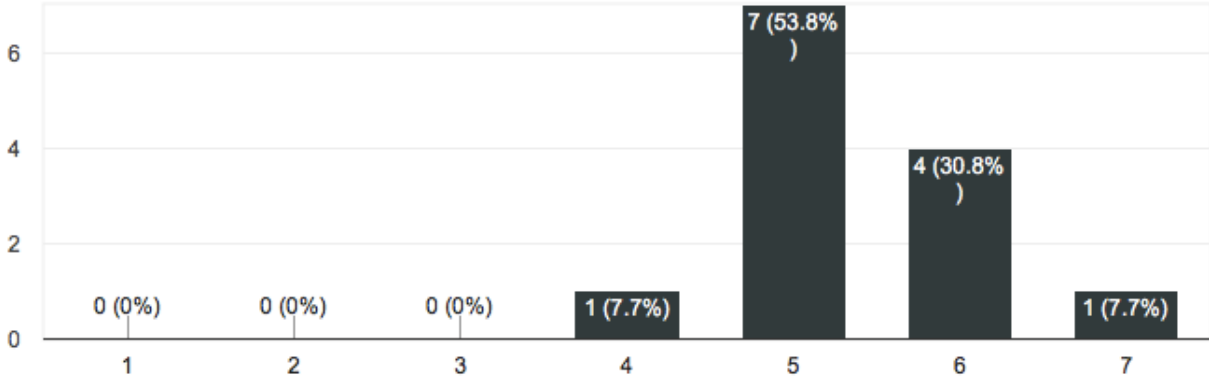
13 responses



# Results: General students perception

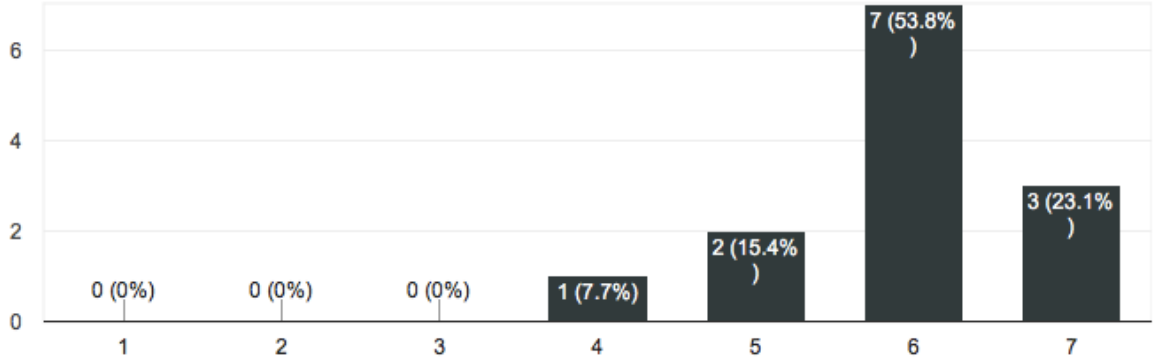
## 1. Videos increase learning (Deepening into material)

13 responses



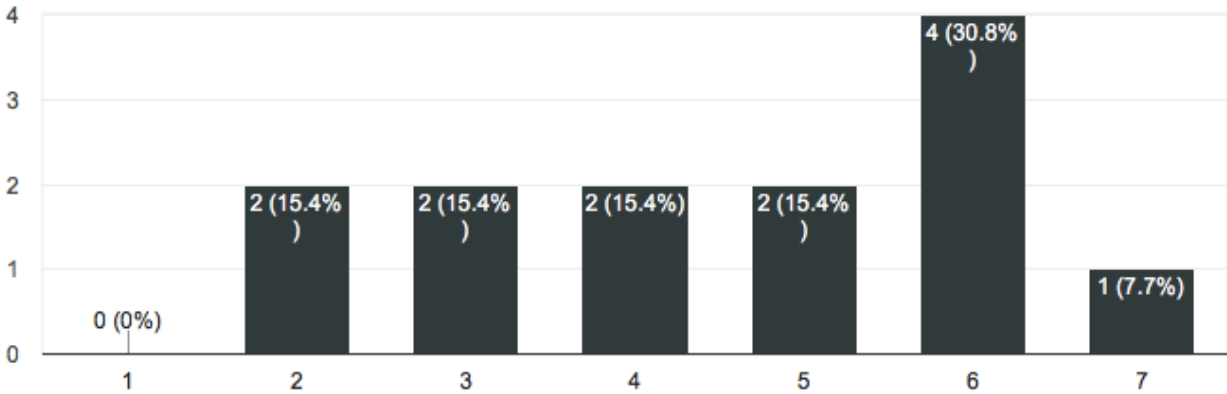
## 2. Videos increase understanding of the topic of the course

13 responses



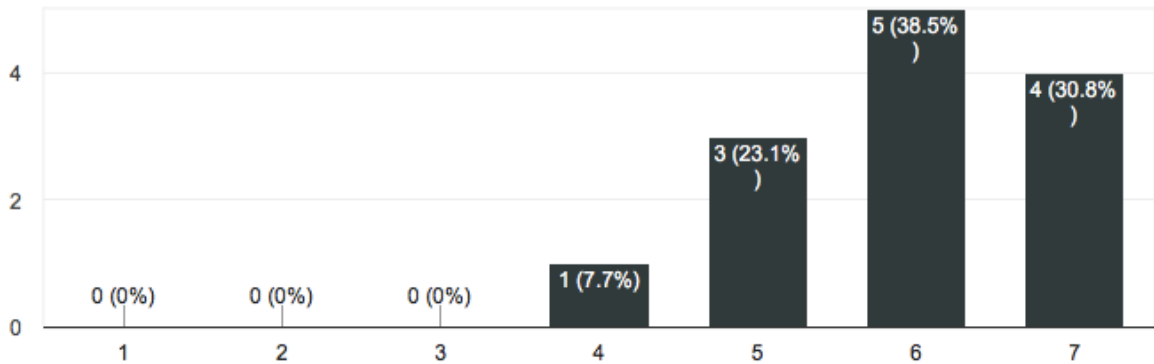
## 3. Videos allow to prepare more questions and comments beforehand for the class

13 responses



## 4. Preparation videos increase my interest and involvement in the future class (topic)

13 responses



# Results: Professor's perception

The prime challenges for professor distinguished in the paper include

- correct instructional design (design)
- effective bridging online and offline content (design)
- development of the online materials (resources, skills)
- appropriate time distribution (resource)

# Results

## **Workload**

“It was too much information for one course”.

“The preparation materials on the separate online platform looks like separate online course”

## **Videos**

“Actually I did not get the full idea what was explained in the videos, just partial understanding was in my mind. When I came to the lectures I had already idea and really easily fill all spaces by details and, finally, obtained the full picture of material”

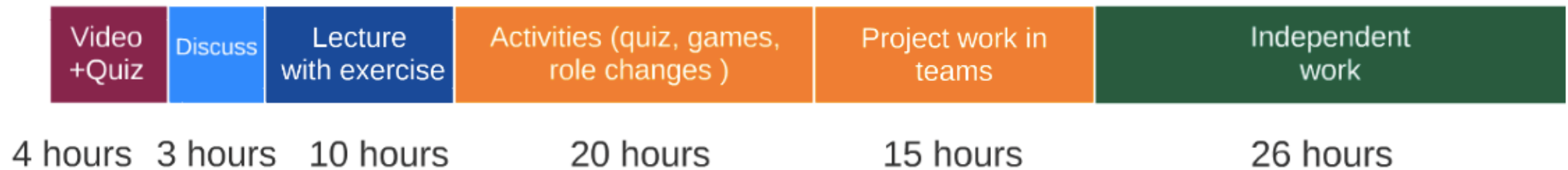
“Most useful application of these videos - comparing your own vision of a problem with professor`s recommendations and advices”

“It would be better to show the text as a whole and not type it because then you can concentrate on what is said instead of following the written text. Now I sometimes missed some sentences of the oral explanations because I was paying attention to the writing.”

# Conclusion

- Positive perception from both students and professor
- Course transition to blended form can be also disappointing and full of defects
- Workload can impact negatively on attitude and participation
- Increased time requirements can be eliminated with the assistance

# Guidelines, Discussions and Improvements



1. Do not increase the course time within the intensive course
2. Decrease the class time, when you add the preparation materials
3. Share the preparation course materials in advance
4. Add motivation (like quizzes) to increase the video views
5. Do not make quizzes too complicated
6. Make the preparation materials «not optional» but required
7. Keep the video duration as 10 minutes approximately
8. Build the bridge between online and offline materials
9. Video density is higher than normal lecture (10 minutes video can require 25 minutes to understand it)

# Course re-design





# M.Sc. Iuliia Shnai

---

Department of Industrial  
Engineering and Management  
**School of Business and  
Management**

Lappeenranta  
University of  
Technology, Finland



**Open your mind. LUT.**

Lappeenranta **University of Technology**

A large graphic on the right side of the slide consists of a thick blue arc at the top and bottom, and a thick green arc on the left side, all curving towards the center. The text "Thank you" is positioned in the center of this graphic.

**Thank you**