# Aalto University School of Engineering

# Viewpoints for self-development and pedagogical education

21.3.2017, Heikki Remes



# Wordle analysis of learning portfolios

1st level



# TEACHING



# "Wordle" analysis of learning portfolios

2nd level

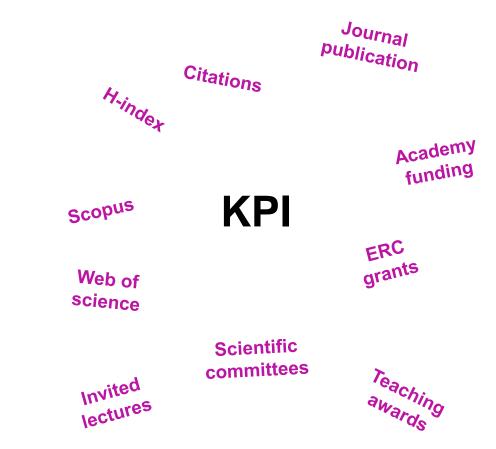




# **Definition of excellence?**

#### Challenges

- Several measures
- Field-specific
- Time-dependent (junior versus senior)

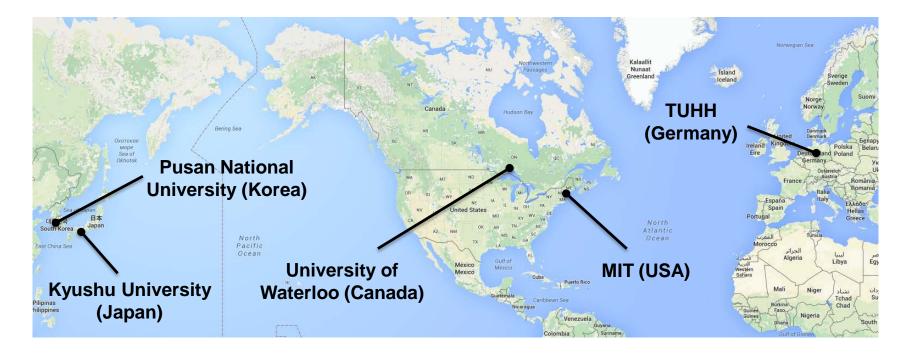




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# My approach to define excellence

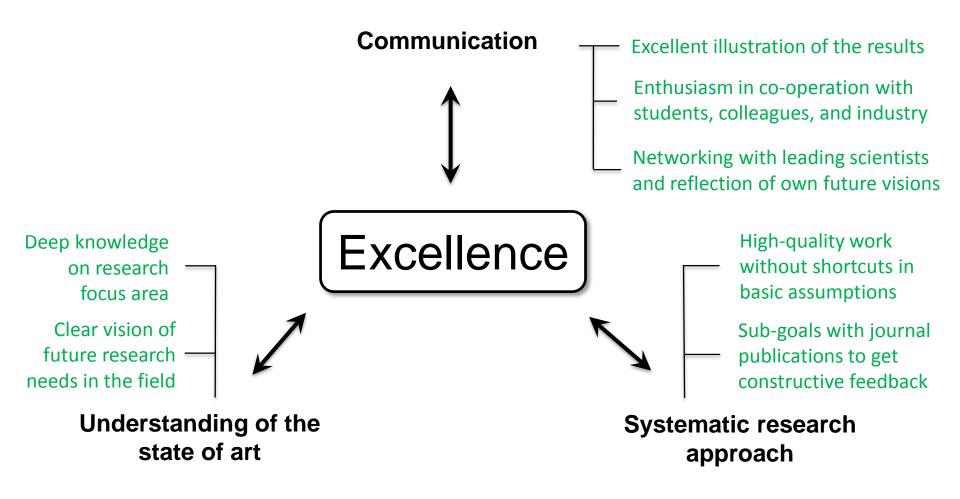
#### **Benchmarking and observations**



#### What are the common elements for excellence?

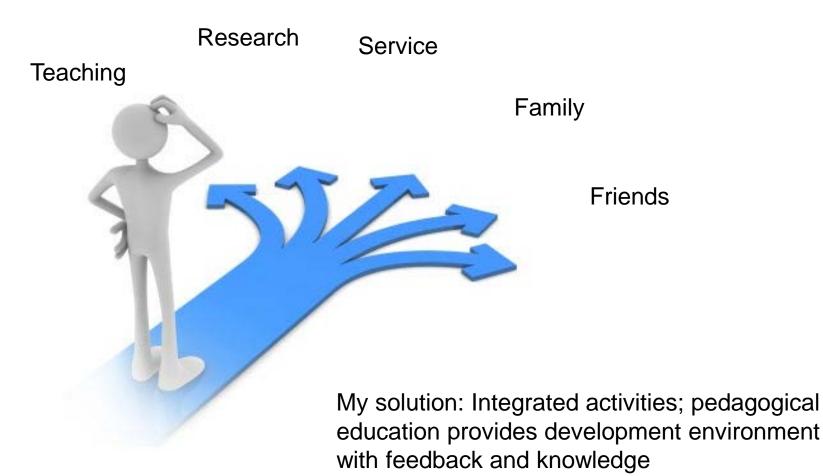


# **My elements for excellence**





## **Time and development management**





## **Time management**

Fixed term	Assistant	Assistant	Associate	Full	Distinguished
Permanent	Professor (1)	Professor (2)	Professor	Professor	Professor
1 Research / artistic and professional work	65% +/-10%	60% +/-10%	50% +/-10%	40% +/-15%	Negotiable
2 Teaching	30%	30%	30%	30%	30%
	+/-10%	+/-10%	+/-10%	+/-15%	+/-15%
Activity in Scientific Community and Academic Leadershi	5% <sup>p</sup> +5%	10% +/-5%	20% +/-10%	30% +/-15%	Negotiable

#### Key principles

- Research emphasis high in the beginning to obtain research portfolio
- Teaching relatively constant to maintain required teaching scale and senior professors in touch with students
- Contribution for academic leadership and collaboration increases with seniority through increased leadership, committee membership and societal interaction
- Mandatory teaching for Distinguished Professors, otherwise work profile negotiated



#### **Time management in Practice** 240% work load => 120% work load

	2017				
Topic	1	2	3	140% -	1.3 h/day
Research, Papers				1	
Lehto Paper 3/Monograph: Plasticity in hardness indentations at different length scales	5 %	5%	2 %		
Liinalampi Paper 3: Influence of 2D simplification on weld notch stress analyses		5%		120% -	8.8 h/day
Liinalampi Paper 4: Fatigue strength analysis of thin welded structure by notch stress approach				120% -	
Åman: Interaction effect of adjacent small defects on the fatigue limit of a pure iron	1%	1%	1%		
Åman: Fatigue Strength Evaluation of Small Defect at Stress Concentration					
Laakso: Vibrations paper revisited				100%	7,35 h/day
Avi: Optimisation paper				100/0	7,35 I/Udy
Rautiainen: Fatigue of 3D ship structures	5 %	5%	2 %		
Sorger: microstructural and fatigue properties of friction stir welded high strength steel plates	10 %	5 %	2 %		
Lehtimäki: Influence of weld notch properties on fatigue strength of extra-high-strength steel, Material design	10 %	5 %	2 %	80% -	
Gallo: Synthesis of experimental testing and fatigue behavior of laser stake-welded T-joints, ICSI		5 %			
Gallo: SED and laser stake-welded T-joints, TAF			2 %		Research
Körgesaar: Penetration resistance of stiffened and web-core sandwich panels: experiments and simulations". Impact engineering					
Jairan: Chraterisation of composite clusters for fatigue; experiments	3 %	3 %	3 %	60%	<b>■┼■┼■┼■┼■┼</b> ■┼ <b>■┼╡</b> ┩┼ <b>╸┼</b> ╸┼╸┼╸┼╸╴┼╸
Jairan: Chraterisation of composite clusters for fatigue: numerics					
Evgeni: Fatigue damage in subgrain	10 %		5 %		Teaching/Studying
Lillemäe: Fatigue strength of high-strength steel plates on very high-cycle fatigue regime	10 %	10%	5 %		
Suominen: The Effect of the Instrumentation Extension to the Measured Ice-Induced Load on the Ship Hull		5%		40% -	
Remes: High-quality welds paper					
Remes: High-quality HSS welds paper - fillet welds					Cosistal Impact/Management
Berto: Calvanised T-joints			5 %	2004	Societal Impact/Management
Research, Management				20% -	
BSA + MANU	5 %	5 %			
EU RAMSESS - to start	1.5 %	1.5%	1.5%		
SA mFAT - progress	4.8 %	4.8%	4.8%	0% -	
				0%	
Teaching					1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 1 2 3 4 5 6 7 8 9 10 11 1
MEC E1002 Applied Mechanics Project, I-V	7.6	3 %	7 %		
MEC-E2005 Ship Systems IV		5 %	11 %		2017 2018 2019
MEC-E2007 Ship Structures and Construction IV		13 %	35 %		
MEC-E2011 Ship Design Portfolio, I-II					24 % - 30 % 19 %
MEC-E8006 Fatigue of Structures II					24 % <del>30 %</del> 19 %
B.Sc. Thesis x 3	2.4%	2.4%	2.4%	2.4%	2.4% 2.4% 2.4% 2.4% 2.4%
M.Sc. Thesis x 3	2.4%	2.4%	2.4%	2.4%	2.4% 2.4% 2.4% 2.4% 2.4% 2.4%
D.Sc. Pauli Lehto	4.8%	4.8%	4.8%	4.8%	<u>4.8% 4.8% 4.8% 4.8% 4.8% 4.8% 4.8%</u>
D.Sc. Sami Liinalampi	1.3%	1.3%	1.3%	1.3%	1.2 <sup>ml</sup> carl carl carl carl
D.Sc. Mari Åman	1.0%	1.0%	1.0%	1.0%	1.4
D.Sc. Matti Rautiainen	1.0%	1.0%	1.0%	1.0%	1.4
P_Sc. Eero Avi	1.0%	1.0%	1.0%	1.0%	1.4
D.S.C. Ateksi Laakso	1.0%	1.0%	1.0%	1.0%	Teaching
D.Sc. Heikki Lamini	1.0%	1.0%	1.0%	1.0%	MEC E1002 Applied Mechanics Project, I-V
Postdoc Evgeni Malitckii Evgenji		1.0%	1.0%	1.0%	1.
Postdoc Jairan Nafardastgerd	1.0%	1.0%	1.0%	1.0%	MEC-E2005 Ship Systems IV
Self-development: clear and efficient communication, focus, energy management	2.4%	2.4%	2.4%	2.4%	24
					MEC-E2007 Ship Structures and Construction IV
Service and Societal Impact IIW + ISSC			1.0		MEC-E2011 Ship Design Portfolio, I-II
	9.5%	4.8%	4.8%	4.8%	
Visiting prof. + exchange students	1.5%		1.5%	1.5%	MEC-E8006 Fatigue of Structures II
	4.8%	4.8%	4.8%	4.8%	4.8
Pre-examination	4.8%				B.Sc. Thesis x 3
Master's program streering + teaching development		4.8%	4.8%	4.8%	M.Sc. Thesis x 3
WITW editorial, journal rewiev, application review		2.4%	2.4%	2.4%	
Conferences, IMDC2018 Organisation, lab meetings		2.4%	2.4%	2.4%	<sup>2</sup> D.Sc. Pauli Lehto
Lecture track			4.8%	4.8%	43
		$\sim$	_		D.Sc. Sami Liinalampi
	Fotal 119 %		136 %	127 %	125
Rese			38.8%	62.6%	72.2
Teaching/Stud	ying 26.7%	41.5%	72.0%	39.3%	_28.0
Societal Impact/Managem	nent 25.3%	20.5%	25.3%	25.3%	25.38 23.38 20.38 20.38 20.38 20.38



### **Development management**



My solution: Continuous development

- Pedacourse with concepts idea =>
- Implementation to practice =>
- Feedback and Reflection =>
- Modification of plan =>



### **Development reflection**

**Teaching portfolio** 

7.11.2016

Remes, Heikki

Promotion from Assistant Professor Level 1 to Level 2 at Aalto University School of Engineering

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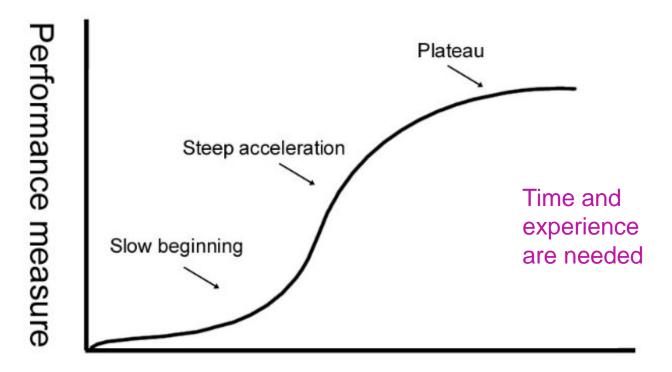
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My solution: Continuous update of own teaching portfolio

- Own teaching history
- Trials and developments
- Achievements
- Self evaluation (strength and weakness)
- Future targets and goals



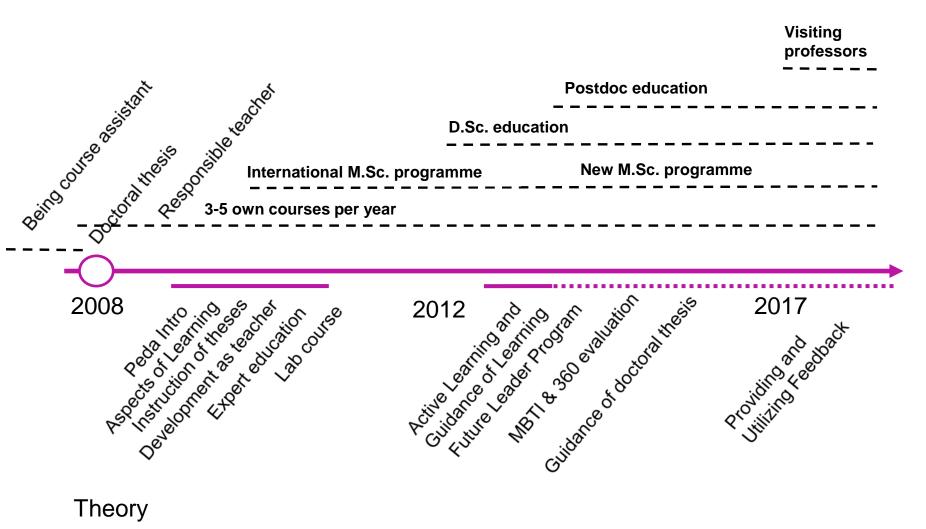
### **Development reflection**



Number of trials or attempts at learning

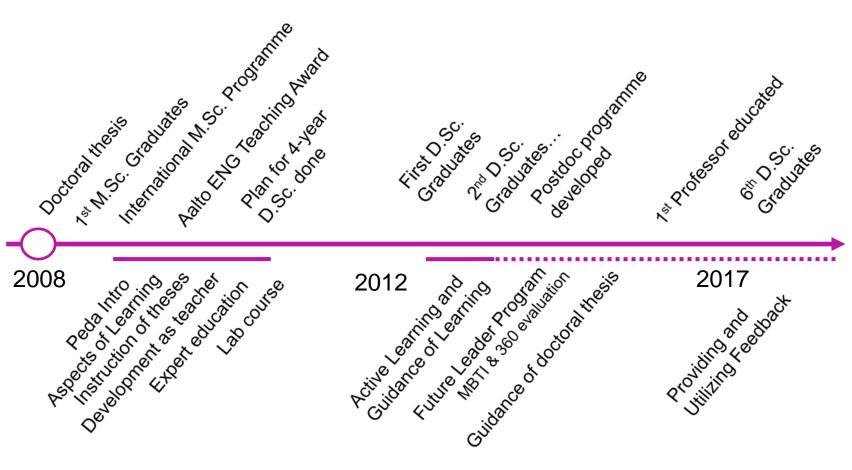


## **Development in practise – my case**





### **Development in practise – my case**



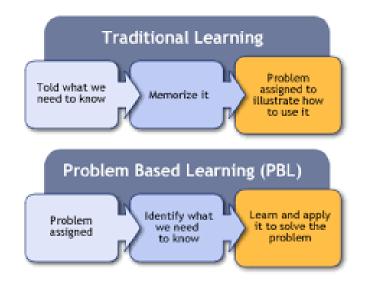
#### Theory



## Have own learning and develop approach

#### **Modified Problem-based learning**

- Develop my own course
- Develop instruction skills
- Develop M.Sc. Programme
- Develop D.Sc. Programme
- Develop post-doc mentoring
- Develop career support





#### **Remember co-operation**





# Case example

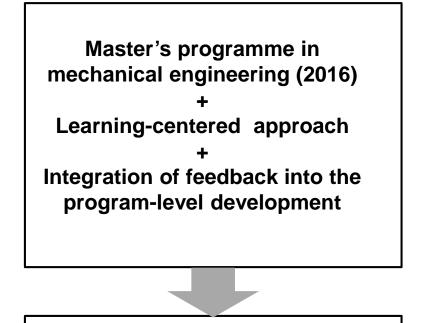
# Feedback system for learningcentered Master's program

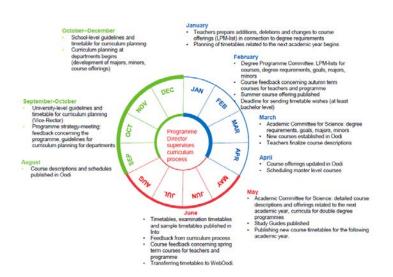
Project work in "Providing and Utilizing Feedback" course

Heikki Remes and Arttu Polojärvi 16.2.2017



#### FEEDBACK SYSTEM FOR LEARNING-CENTERED MASTER'S PROGRAM



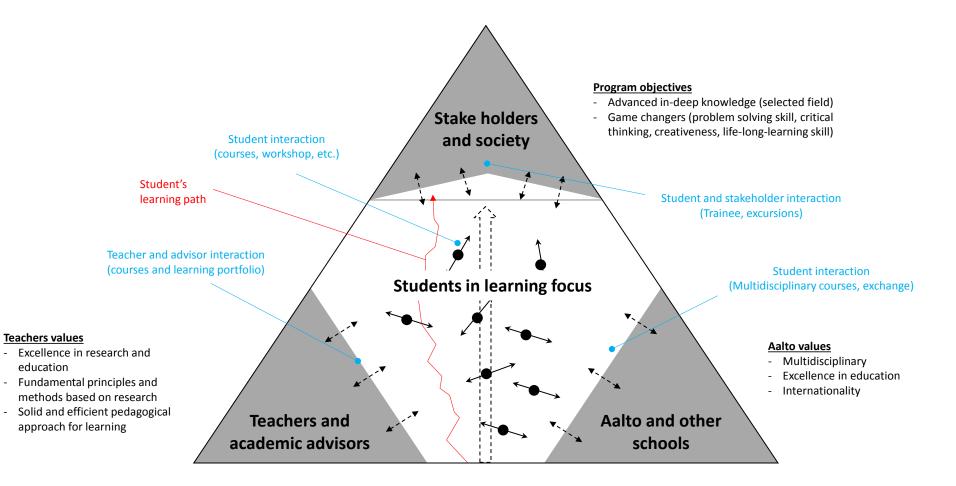


FEEDBACK SYSTEM FOR THE PROGRAM-LEVEL DEVELOPMENT

#### Annual clock for curriculum development.



#### **ACTORS IN A LERNING-CENTERED STUDY PROGRAM**





Students ↔ Teachers ↔ Program ↔ Schools ↔ Aalto

#### **FEEDBACK SYSTEM CONCEPT** Currently in test Short-term feedback **Continues feedback** Course feedback Learning process feedback Updates of existing system: the New dynamic feedback systems to relevance of course in personal measure success of learning in DEC JAN study goals in program level program level res. 404 MAR 50 Programme Director supervises APR curriculum Ш process Ont Far Mid-term feedback Long-term feedback JUL NUL Program feedback Aalto alumna feedback New feedback questioner about learning Existing feedback system for process relevance and efficiency for both students graduated from the student and teachers.

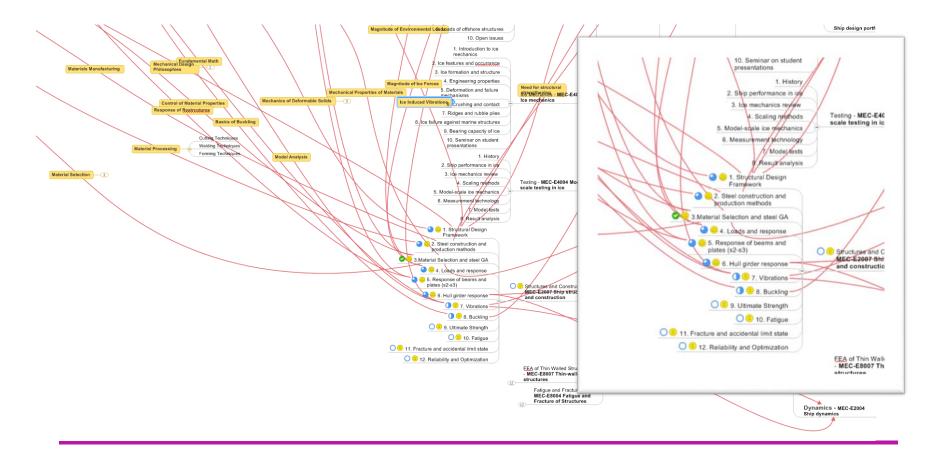


program

Different actors ↔ Different time interval  $\leftrightarrow$  Different levels Holistic feedback approach

#### **CONTINUOUS FEEDBACK SYSTEM**

 A mind map of ship structures course and its' relation to your other studies





Different actors ↔ Different time interval ↔ Different levels Holistic feedback approach

#### **CONTINUOUS FEEDBACK SYSTEM**

• Before lecture each student provides 3-5 bullet points about the most challenging issues (student feedback for a teacher).

#### Feedback or topics that need more clarification from 2nd week's lectures:

-Terminology related to welding and sub-block assembly -tandem building dock

-difference between mig/mag and fcaw welding techniques -How is aluminum superstructure combined with steel hull without corrosion problems?

Lecture 3 and 4

- What is the best industrial practice used in achieving effective continuity in the structure since the ship is made in boxes before assembling.
- What do you mean by 'Corrugated bulkheads are easy to clean'?.
- How does increasing strength influences the cost of production?
- Why is aluminum preferred to steel in making hull girder?



#### **CONTINUOUS FEEDBACK SYSTEM**

Subject: Re: MEC-E2007 Ship Structures and Construction L - Personal work - Week1

Hei,

Sellanen homma vielä, että opiskelumotivaatio on tämän myötä kasvanut. Tullut jotenkin mielekkäämpää kun pystyy vaikuttamaan opetukseen.

Hämmästyttää kummastuttaa viikolle 3:

- Tämän viikon diat ja harjoitus saavat matematiikan osalta toivomaan pienoista kädestä pitelyä. Toivotaan että logiikka aukee luennoilla.
- Viikon big picture väännettynä ratakiskosta.
- Esimerkkejä elävästä elämästä.

Luennon 6 toisessa diassa on korostuslaatikko väärässä kohdassa.

ΥT



# Summary

- In order to develop wordclass knowledge and skills, we need systematic personal development plan
  - Goal setting for 10-20 years with motivation
  - Development steps with cumulative learning
  - Reflective learning environment = pedagogical education and courses
  - Self-evaluation and reflection

