



Excited

Centre for Excellent IT Education

Overview and research directions

IPIT kick-off, Trondheim, June 2018

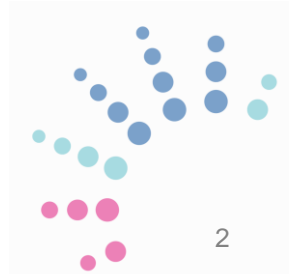
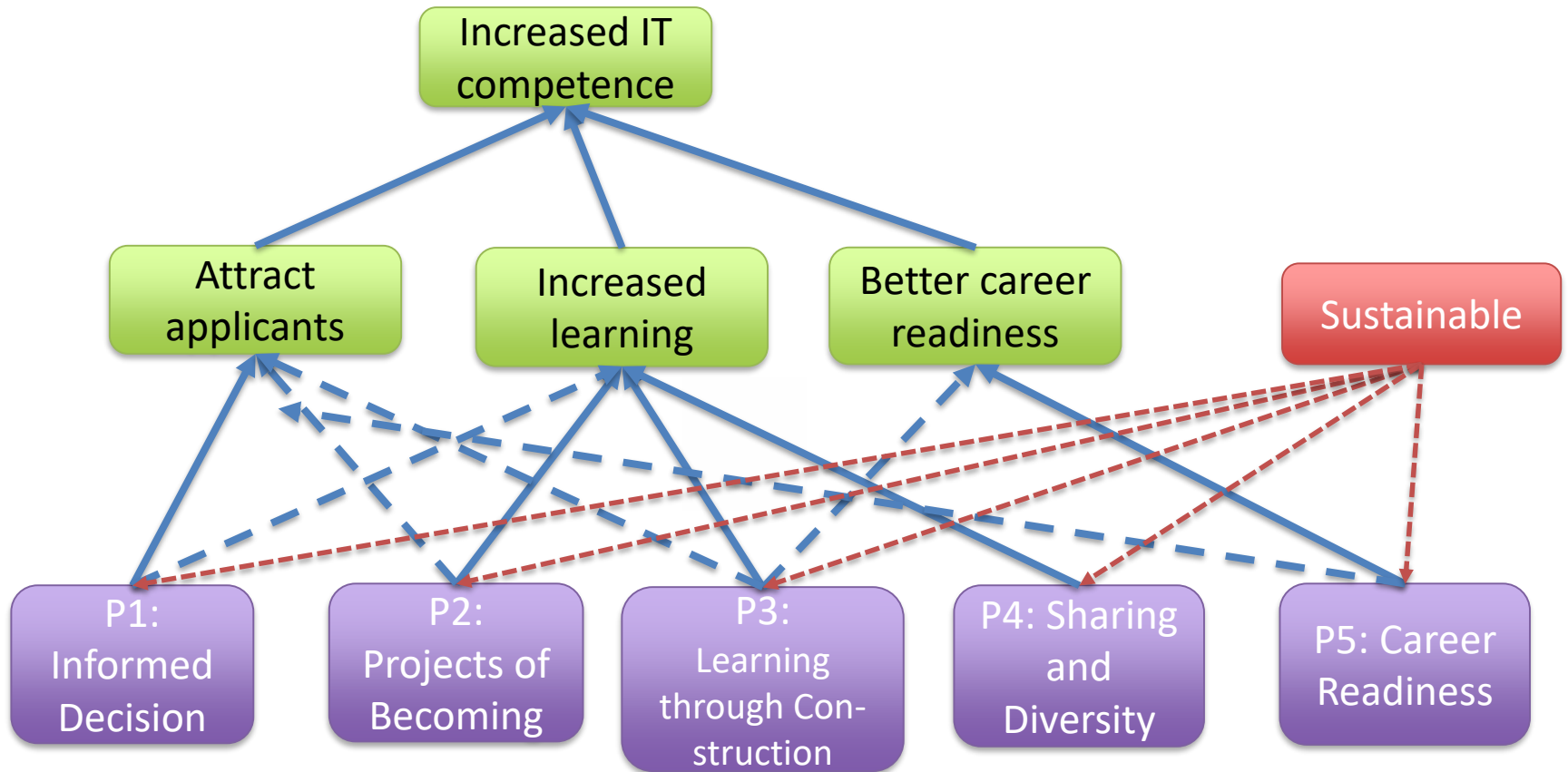
Guttorm Sindre



Centre for
Excellence in
Education

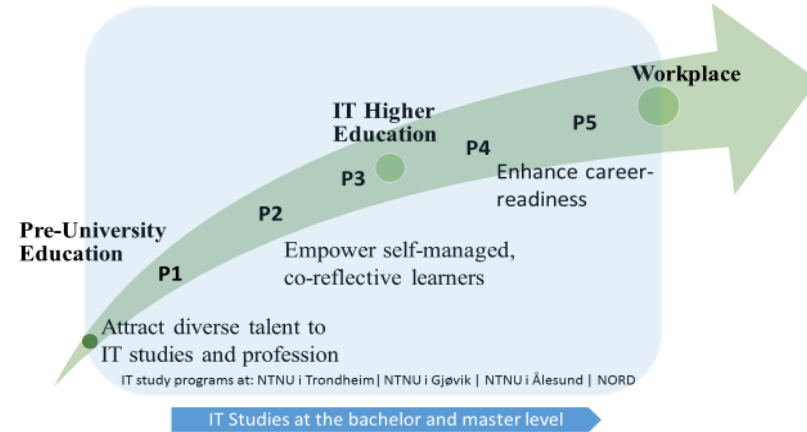


Goals and the five projects



Activities

(5 projects w/ strong synergies)



P1

Increase the **knowledge of IT and the IT profession in the population**, esp. for pre-university students (NTNU, Divitini)

P2

Engage **first year students** in exploring the IT discipline, encourage good working habits from day one (NTNU, Aalberg)

P3

Nurture students' excitement by “learning through **construction**” (NORD, Kolås)

P4

Concepts, practices, and tools for students and teachers; **innovative arena for cross-campus learning** (NTNU, Hjelsvold)

P5

Strengthen and expand the **education-work connectivity**, support continuous learning and reflection (NTNU, Krogstie)

P1 : Informed Decision

- What?
 - Help improve pre-university IT education
 - Improve university activities towards pre-university youth
- Why?
 - Although we have good recruitment, it can be better
 - And not just about our study programmes
 - Achieve better gender balance, overcome prejudice
- How?
 - Contribute to IT teacher education
 - Make appealing learning resources and events
 - Communicate variety of jobs and skills needed
- Strengths and challenges
 - A lot of experience already, many things to share
 - Lower education is beyond our control
 - Programming course in middle-school: a double-edged sword?

P2 : Projects of Becoming

- What?
 - Help students make the transition from high-school to university
 - Develop good study habits from Day 1
- Why?
 - Poor study technique / working habits from high-school
 - Procrastination, failure to tackle increased freedom
 - For some: Loneliness
- How?
 - Revise / revolutionize intro program for new students
 - Entire semester / year rather than short boost
 - More focus on study skills (identify and address shortage)
 - Team and community building through course exercises
 - "You are the project leader!" (but need a plan, and a PM tool)
- Strengths / challenges
 - Many campuses to draw experience from
 - High potential for student contributions
 - Competence in tools, projects, agile processes
 - Turning a supertanker

P3: Learning through Construction

- What?
 - More "learning through construction" (LtC) to increase student motivation and engagement
- Why?
 - Allowing students the satisfaction of making something that works, that they can show to others, and be proud of
- How?
 - Have more projects and other LtC activities as courses / between courses / in courses (e.g., exercises)
- Strengths / weaknesses
 - Already have many such activities, long experience
 - Unclear learning outcomes? Hard to set a standard
 - Conflicts between courses?

P4: Sharing and Diversity

- What?
 - Collaborate across campuses
 - And develop tools to support this
 - Increased diversity of offerings
- Why?
 - More effective use of resources
 - Higher quality and more choice for students
- How?
 - Share experiences in a Community of Practice
 - Pilot projects on cross-campus learning
 - Combine the best of campus-based and MOOC-style education
- Strengths and challenges
 - High tech competence
 - Merger and increased scale as an opportunity
 - Merger as a source of fuzz and anxiety
 - Bridging different cultures and traditions

P5 : Career-Readiness

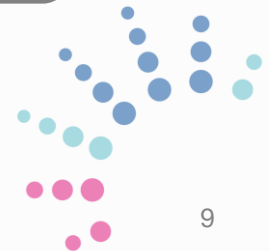
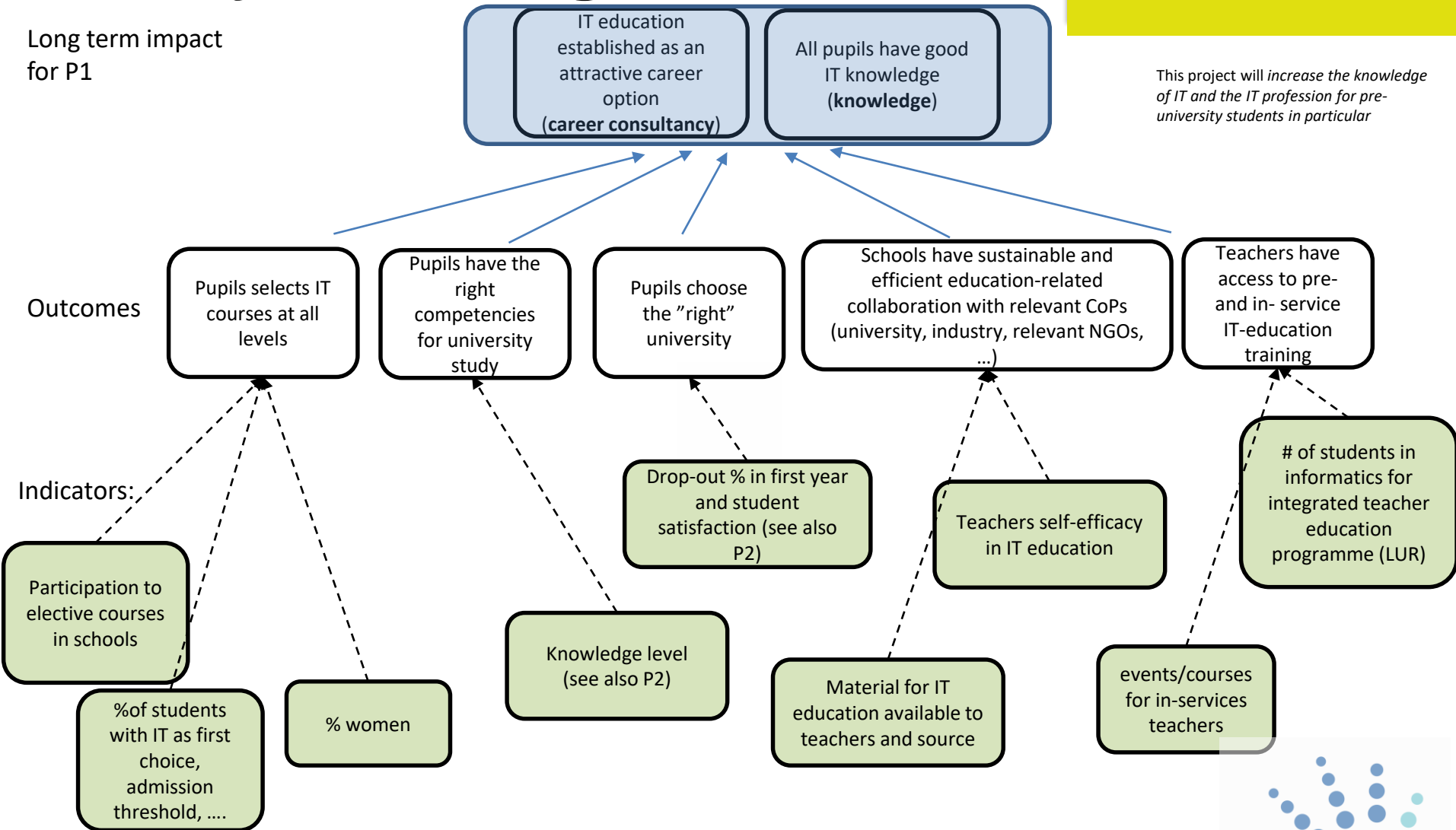
- What?
 - Understand work-life needs and relevance of curricula
 - Increase industry participation in teaching
- Why?
 - Increase career-readiness of candidates
 - And students wrt summer jobs
 - Show relevance of all courses, enhance motivation
- How?
 - Gather data from employers, alumni, int'l sources
 - More clever use of guest lectures, projects, etc.
 - Encourage student self-reflection
- Strengths / challenges
 - Already do a lot here, good industry connections
 - Avoid being too impacted by a subset of potential employers

Theory of Change, P1

P1 - Attract diverse talents to IT

Long term impact for P1

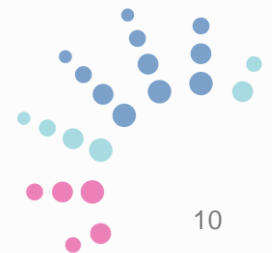
This project will increase the knowledge of IT and the IT profession for pre-university students in particular



Theory of Change, P2

P2 – Projects of becoming (FYE etc.)

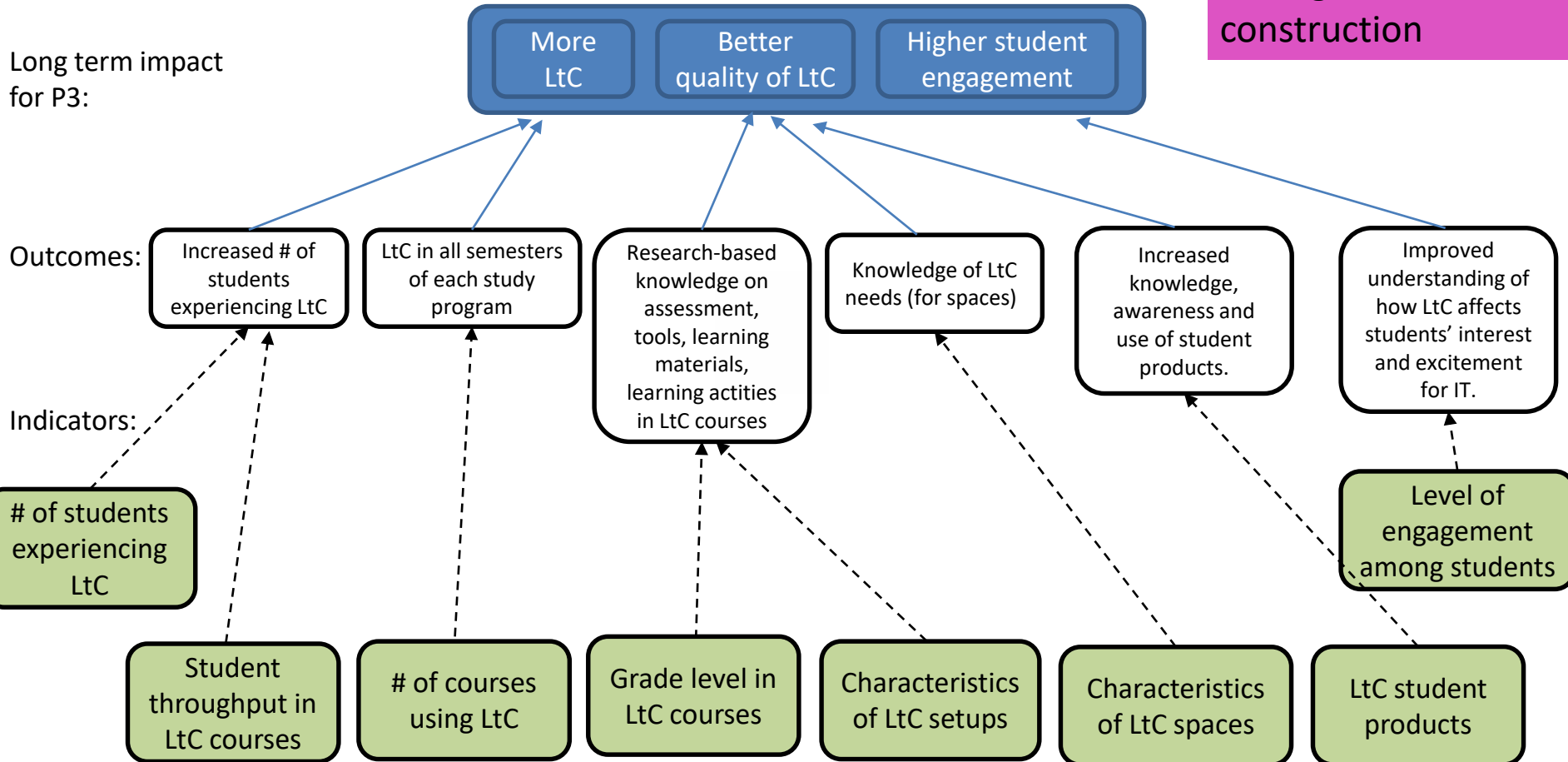
Projects	Indices	Baseline Evidence	2018 Activities		Intended Impact (2021)
P2: "Projects of Becoming"	Number students continuing after first year	NTNU statistics on dropout	Informatikk arbeidsdag		Increased production of candidates
	Students motivation (for studying IT)	Studiebarometer questions on inspiration, learning environment, education Own studies	Change of activities in first year courses		Increase the reputation of our programs
	Students engagement for IT	Students participating in IT-activities	Project course in first year		Increase the reputation of IT
	Study habits	Studiebarometer questions on number of hours, learning activities	Activity-based learning		Change in study habits



Theory of Change, P3

P3 – Learning through construction

Long term impact for P3:



ToC. P5

Long term impact
for Career
Readiness

Successful employment and career for
IT candidates (Bachelor & Master)

Outcomes

Candidates have the
right competence for
the jobs (*employability*)

Students make the
right career choices
(*career readiness*)

University/faculty (IT dept) has
sustainable and efficient education-
related collaboration with industry

Assumptions/
conditions

The study
programmes have
relevant learning
outcomes and
adequate teaching/
learning approaches

Students
understand their
own competence
and possible roles in
work life

Industry
networks
are available
to faculty

Industry has
channels for
establishing and
maintaining contact
with university

Students have
overview and
choices of
relevant industry
partners for
projects

Indicators

%candidates
with relevant
job X months
after
graduating

%students with
relevant
summer job
after 2nd and
3rd year

Career choices and
types of competences/
study programmes are
visible and
understandable

Students engage in
reflecting on their
own learning/
competence

Institutionalized
and personal
networks used
successfully

Student organizations
cooperate with
employers on events
and recruiting

Employers
views of
candidates'
competence

Alumni's
view of their
competence

Students' (esp.
Year 3-5) view of
their competence

Univ (IT dept) web
pages are
informative and
engaging wrt study
prgs and career
choices

#courses
supporting
reflective
learning
(e.g. with
e-
portfolio)

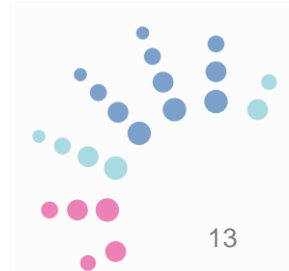
%returning
customers
in selected
courses

%external
projects
in
selected
courses

%courses
arranging
guest
lectures

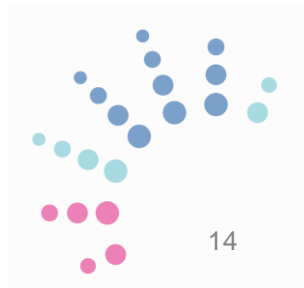
Mini-projects in Excited

- Goal:
 - Engage more teachers in Excited
 - Inspire them to come up with, and evaluate, interventions
- Announcement:
 - Two rounds in 2017 (deadline April, October)
 - Suggested amount: 50 KNOK
 - Possible use:
 - Cover additional cost for making and evaluating intervention
 - **Not** normal operation of teaching
 - Prioritized: reusable resources or findings, collaboration
 - Suggested use
 - Personnel time (own or assistance)
 - Equipment, licenses
 - (travel, social events, ...)



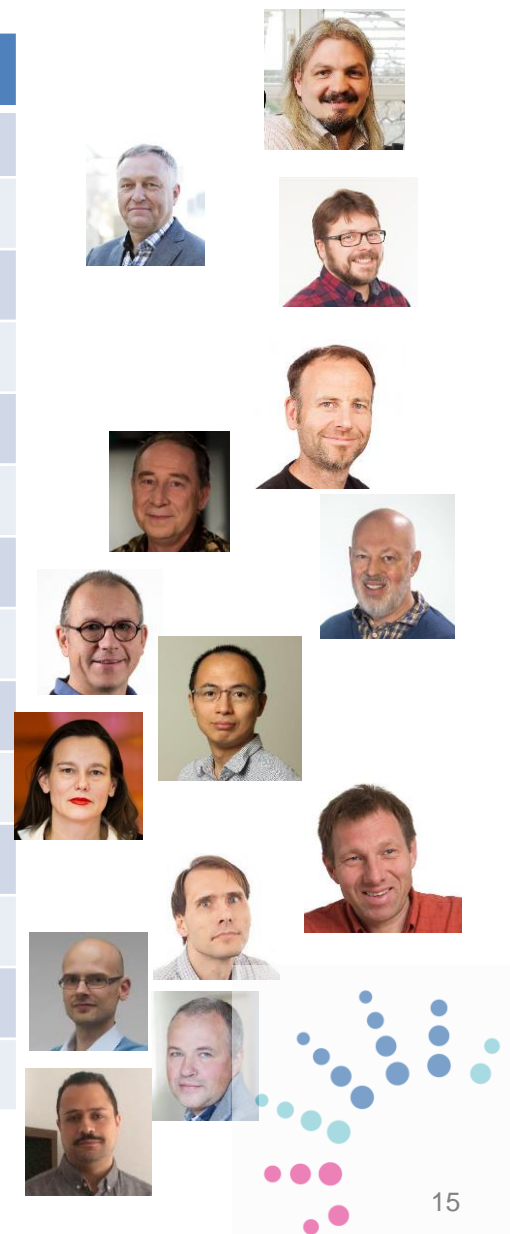
Mini-projects, received applications

- All campi and projects (P1-P5)
 - 15 projects done / almost finished 2017, 12 new started
- Typical topics
 - Approaches and resources for novice programming
 - E-assessment, e-feedback
 - Infrastructure for more realistic exercises
 - Student-developed learning resources
 - More interactive lectures
 - Video and other web-based learning resources
 - Project based learning, organization of groups and assistants
- Recently announced mini-projects for students
 - Deadline 1 March



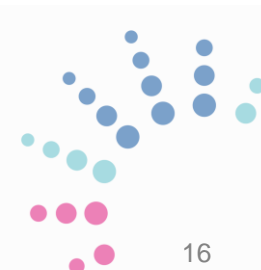
Miniprosjekter, H'17

	Søker		P1	P2	P3	P4	P5
Koding for ungdom	McCallum	G	x				
Ressurser til nye kodeklubber	Tomren	Å	x				
Kartlegge gruppeorg. oppstartuker	Munkvold	N		x			
Auto-tilbakemelding på kode	Trætteberg	T		x			
Effekt av stud.ass. LtC-aktiviteter	Curda	N			x		
Læringsressurser med droner	Sund	N			x		
Rammeverk prog.øvelser på IoT	Osen	Å			x		
Rammeverk distribuert simulering	Wang	Å			x		x
Støtte sosial innovasjonsevent	Jaccheri	T			x		x
Infrastruktur interaktive forelesn.	Nytrø	T			x	x	
Multimediebok for TDT4265	Lindseth	T			x	x	
Studentskrevet wiki-kompendium	Strazdins	Å			x	x	
Workshop: prosj.ledelse i praksis	Strand	T			x		X
Ekspertsystem for vurdering	Hameed	Å				x	

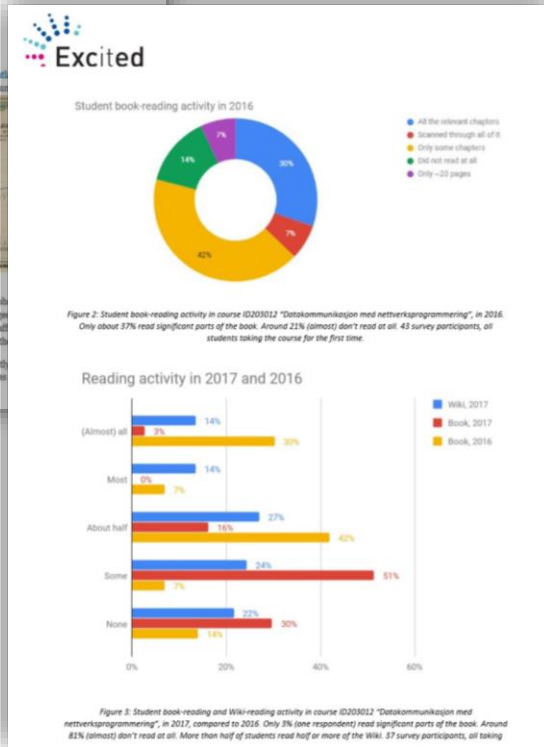
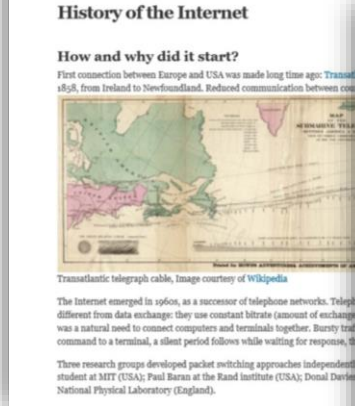
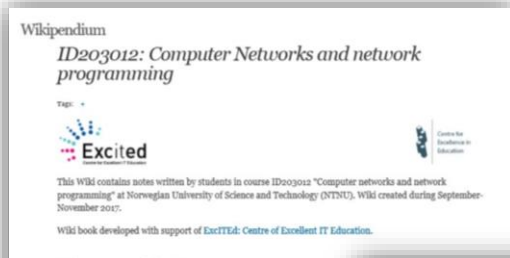


Miniprosjekter, V'18

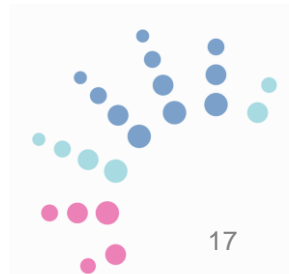
	Søker		P1	P2	P3	P4	P5
Wiki / video for basisferdigheter	Hjelle	T	x	x		x	
Jentenettverk	Sigurdardottir	N	x	x			
Erfaringsoverføring til nye stud.	Skundberg	T		x			
Faglig fadderopplegg & e-portefølje	Pedersen	G		x	x		x
Auto-evaluering øvinger	Haddow	T			x		
Utstyr for IoT-øvinger	Li	T			x		
Sys.utv.emne i retning GameLab	Strazdins	Å			x		
Ressurser for distribuert læring	Elster	T			x	x	
360 video	Holand	N			x	x	
Støtte sosial innovasjonsevent	Jaccheri	T			x		x
Medstudentvurdering, verktøy	Skundberg	T				x	
Workshop: næringslivskontakt	Munkvold	T			x		x



Example: Student-written wiki



- Some success:
 - Engaging students
 - Team work, writing skills
- Some failure:
 - Book reading decreased
 - No improvement of student performance
- No detailed scientific evaluation so far

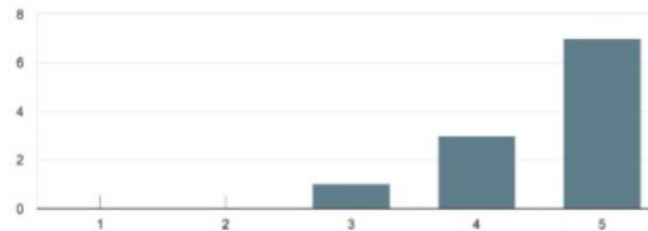


Example: Project management workshop

- Previous year:
 - Theory + textbook examples
- Idea:
 - Expose students to a real project case
 - Guest teacher from industry
- Procedure
 - Presented project
 - Bringing up problems that actually happened
 - Asking the students to discuss and suggest solutions
 - Present actual solution

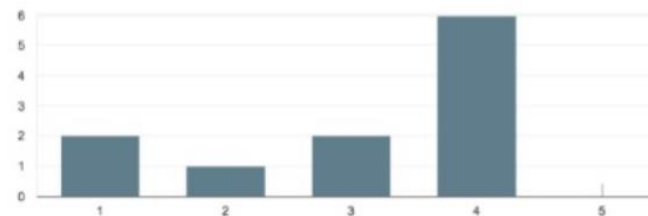
Jeg fikk et godt utbytte av dagen.

11 svar



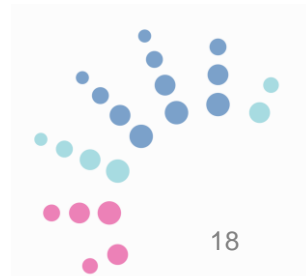
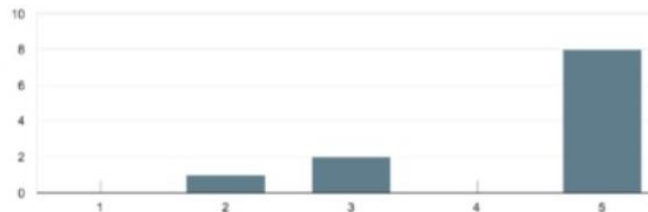
Det var vanskelig å henge med i casen.

11 svar



Jeg fikk svar på spørsmål jeg hadde underveis.

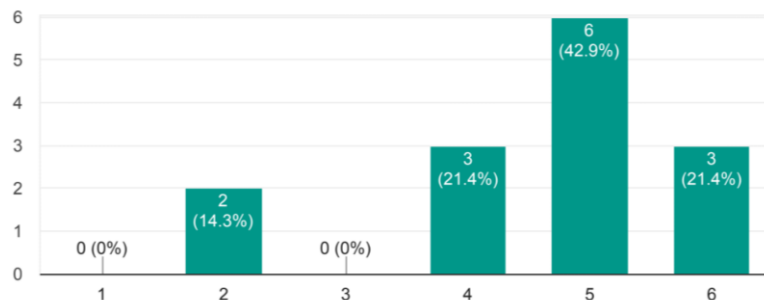
11 svar



Gauging effectiveness of TAs in enhancing the learning experience

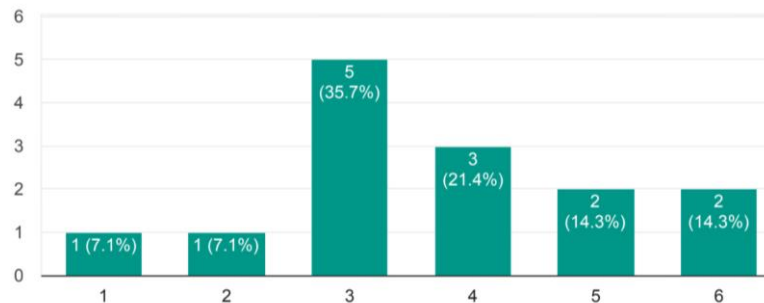
To what degree did you feel motivated by the use of TAs in your own age bracket who have specific knowledge of a topic?

14 responses

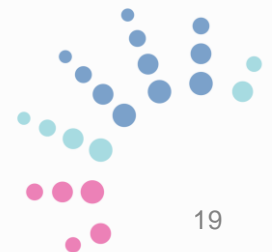


To what degree did the introduction of these topics lead you to explore them further, beyond the class assignment?

14 responses



- Success:
 - Students reporting a good learning experience
 - Though some variation between two sound packages
 - Satisfied with TA's
- More worrying
 - Lack of intrinsic motivation?
 - Did not manage to stimulate this very much



Some questions about strategy ...

- Balance between having impact and documenting impact?
 - Some things are easy to measure but not interesting
 - Some things are interesting, but very hard to measure
- Balance between local improvement and dissemination to the rest of the world
 - Local: better learning for own students, better community of practice among teachers
 - Global: making open resources, going to conferences, int'l collaboration
- “The opposite of your strategy must also be a viable strategy”

