

Møtereferat

Til stede:	Malin Torsæter, Morten Sylvester, Pawel Sikorski, Julie Stene Nilsen, Kristin Grendstad Sæterbø, Peter Marius Flydal, Erik Livermore, Erik Wahlström, Aud Lise Kulseth (referent)		
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Kopi til:			
Gjelder:	Referat styremøte IFY 2016-10-20		
Møtetid:	Kl 13-15	Møtested:	E4-107

S-sak 20/2016

OMORGANISERING

Fusjon og innsparingskrav er grunnlag for administrativ omorganisering. Administrativ bemanningsplan ble presentert. Det er besluttet at det nye Fakultet for naturvitenskap (NV) har skal ha matriseorganisering av administrasjonen. Det arrangeres jevnlig informasjonsmøter med administrativt ansatte.

Konklusjon:
Styret tar saken til orientering.

S-sak 21/2016

STRATEGI

Skal strategiarbeidet ha hovedfokus på forskning og deretter undervisning eller omvendt?

- Instituttleder presenterte status for strategiarbeidet, se saksvedlegg. Faggruppens forslag til strategiplan omarbeides til å følge samme mal som «Strategi for fagområde Materialer». Instituttet har pr i dag 37 faste vitenskapelige stillinger, noe som er lavt for å kunne være et breddeinstitutt. Som følge av mulige avganger vil det bli utlyst 2-5 stillinger i løpet av de neste to årene. Andre momenter i strategiarbeidet:
 - NTNUs og fakultetets strategi
 - Forflytting av allmennfag fra HiST som pr i dag er organisert ved IME
 - Avklaring av skolelaboratoriets rolle
- Instituttet arrangerer strategisamling 12. desember for alle faste ansatte og styre.

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Konklusjon:
Styret tar saken til orientering.

S-sak 22/2016 ØKONOMI

RD - Ramme drift 662005 - Institutt for fysikk	Pr september 2016				2016	
	Årsbudsjett	Periodisert	Regnskap	Avvik	Prognose	Prognose
Bevilgning	-61 469	-41 221	-40 001	1 220	-60 751	-61 093
Overføringer fra BOA	-23 618	-16 971	-15 337	1 634	-20 131	-22 133
Andre eksterne og interne inntekter	-1 660	-1 191	-2 242	-1 051	-4 670	-2 721
SUM INNTEKT	-86 747	-59 383	-57 580	1 803	-85 552	-85 947
Invest	7 225	3 125	3 150	25	6 705	8 728
Lønn	52 206	37 509	37 603	94	-37 603	55 026
Driftskost	14 846	11 670	9 248	-2 422	13 237	11 500
Internhusleie	1 528	1 146	1 146	0	1 528	1 528
Egenfinansiering BOA	14 295	10 284	7 153	-3 131	14 295	13 900
SUM KOSTNAD	90 100	63 734	58 300	-5 434	-1 838	90 682
RESULTAT	3 353	4 351	720	-3 631	-87 390	4 735

RSO - Ramme strategi- og omstilling 662005 - Institutt for fysikk	Pr september 2016					
	BUDSJETT	Periodisert bud	Regnskap	Avvik	Prognose	
Bevilgning	-13 990	-9 239	-10 130	-891	-21 401	
Andre eksterne og interne inntekter			4	4	11	
SUM INNTEKT	-13 990	-9 239	-10 126	-887	-21 390	
Invest	1 490		2320	2 320	8 979	
Lønn	9 898	8 179	7 992	-187	10 864	
Driftskost	1 001	538	146	-392	557	
SUM KOSTNAD	12 389	8 717	10 458	1 741	20 400	
RESULTAT	-1 601	-522	332	854	-990	

Konklusjon:
Styret tar saken til orientering.

S-sak 23/2016

STUDIER – OPPFØLGING AV EVALUERING

- DeltaQ: Førstemanuensis Magnus Lilledahl orienterte om prosjektet, se saksvedlegg.
Utgangspunkt for prosjektet er
 - The lack of collaboration among faculty
 - The lack of collaboration among students
 - The lack of collaboration between students and faculty
 - The lack of proven pedagogical practices
 - The missing link between study programs and course content

Konklusjon:

Styret tiltreder initiativet og anbefaler at arbeidet med DeltaQ fortsetter.

- Studieprogramrevisjon: Det er nedsatt en arbeidsgruppe bestående av John Ove Fjærestad, Bjørn Torger Stokke, Erik Wahlstrøm og Reidar Lyng fra PDU som ser på CDIO-modellen. Arbeidsgruppen skal utarbeide en plan for det videre studieprogramrevisjonarbeidet i løpet av desember 2016.
- Revisjon øvingsopplegg/blackboard: IFY er pilot i innføring av Blackboard og dette arbeidet evalueres i november 2016.
- Fysikkland 2.0: En arbeidsgruppe bestående av studiekonsulent, 1 ingeniør, studentrepresentanter og instituttleder arbeider med etablering av Fysikkland, som vil være arealer for lab/øvinger i tillegg til sosiale lokaler for fysikkstudenter. Aktuelle arealer i C4 og B3.

Konklusjon:

Styret tar sakene til orientering

Eventuelt

Instituttet har fått to prosjekter i NANO2021:

- Acoustic Cluster Therapy (ACT) for improved treatment of cancer and brain diseases – Catharina Davies
- Graded composition semiconductor-core glass fibers for Solar Energy – Ursula Gibson

Utkast – Institutt for fysikk NTNU - strategi

Overordnet visjon - Fysikk for fremragende kunnskap

"Institutt for fysikk skal være et internasjonalt ledende institutt med bredde innen fag og aktivitet som dekker de essensielle delene av fysikkområdet. Instituttet skal og ta et førende nasjonalt og internasjonalt ansvar innen de fysikk-områder som gir grunnlag for NTNU:s og Norges langsiktige utvikling innen det teknisk-naturvitenskaplige området."

Hovedmål for å nå visjonen:

-Øke gjennomstrømning og opptak så at vi utdanner >100 mastergrader ved instituttet / år med stadig økende kvalitet.

-Etablere vår rolle som breddeinstitutt ved det nye NTNU gjennom å opprette et vel tilpasset fagtilbud rettet mot ikke-fysiker.

-Etablere fysikk som et førende institutt innen universitetsdidaktikk innen fysikk som sammen med andre enheter på NTNU tilbyr en høykvalitativ utdanning innen fysikkområdet på alle nivå.

-Konsolidere faggrupperinger og fagstrategier så at de danner en solid basis for internasjonalt og nasjonalt lederskap og utvikling over tid.

-Konkretisere fremtidens behov av fysikk innen teknologi og naturvitenskap gjennom tette koblinger mot verdikjeder innen innovasjon og forskning sammen med andre teknisk/naturvitenskaplige problemeiere.

Arbeidsmiljø / Organisasjon - Felleskap for fysikk

"Institutt for fysikk skal attrahere den beste arbeidskraft og de beste studenter gjennom et støttende, inkluderende og utviklende felleskap."

Undervisning – Bredde gjennom dybde

"Institutt for fysikk skal være det faglige sentret for utdanning innen fysikk på alle nivåer på NTNU, den fremste utdanningsinstitusjonen for fysikere for Norsk samfunn, og et internasjonalt eksempel på fremragende utdanning innen fysikk."

Forskning - Muliggjørende og grensesprengende fysikk

"Alle etablerte faggrupper skal være internasjonalt velkjent eller ledende innen sine fagområder. Instituttet skal være en foretrukken partner innen sine forskningsområder, førende for utviklingen av fysikkbasert kunnskap og metoder innen instituttets samarbeidsområder på NTNU."

Formidling - Fysikk for alle

"Instituttet skal være den foretrukne fagkilden for fysikk i Norge innen kunst, populærvitenskap, lavere utdanning og ved viktige beslutninger."

Innovasjon – Kreativ fysikk for fremtiden

"Instituttet skal generere strømmer av idéer, studenter og forskning mellom institutt og viktige aktører i norsk verdiskaping"

- **Instituttets hovedstrategi** Inneholder følgende:
 - i. **Overordnet Visjon** for instituttets virksomhet
 - ii. **Strategi for arbeidsmiljø / Organisasjon**
 - 1. Mål for sosial miljø / kultur
 - 2. Mål innen annet HMS-arbeid
 - 3. Mål for rollefordeling ved instituttet
 - iii. **Undervisningsstrategi**
 - 1. Rolle innen det nye NTNU, Norge etc...
 - 2. Kvalitetsmål innen undervisning
 - 3. Mål for bredden innen undervisning (studieprogram/ kurs, faglig bredde).
 - 4. Mål for didaktisk utvikling/forskning.
 - 5. Mål for fagspesifikk undervisningsinfrastruktur.
 - iv. **Forskningsstrategi:**
 - 1. Rolle innen det nye NTNU, Norge etc...
 - 2. Kvalitetsmål
 - 3. En oversikt av ulike faggrupper med visjon for utviklinga av områdene på 10 års sikt.
 - 4. En beskrivelse av samarbeidsområdene, og strategiske mål for de områdene.
 - 5. En beskrivelse av målen for infrastruktur.
 - v. **Formidlingsstrategi**
 - 1. Rolle
 - 2. Mål
 - vi. **Innovasjonsstrategi**
 - 1. Rolle
 - 2. Mål
 - vii. **Vedlegg**
 - 1. Handlingsplaner
 - 2. Bemanningsplan
 - 3. Organisasjonsdokumentasjon (Organisasjonskart, laborganisasjon etc..)

DeltaQ - Action plan 2016-2019

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Introduction

The current educational system is embedded in an existing culture which sustains current practice and obstructs improvement. DeltaQ is a center aimed at understanding the current culture and investigating how the cultured can be transformed to support a better education for students. In addition to publishing

project results the center will maintain several documents which synthesis best practices with regards to e.g. developing collegial culture, student culture and study program design.

Background

This section describes some features of the current culture that obstruct improvement of the quality of education. This analysis is the basis for the choice of research and development activities of DeltaQ.

The lack of collaboration among faculty

In many departments, there is very little collaboration between scientific staff in teaching matters. In most cases professors focus solely on their own course and communicates very little with other colleagues with regards to pedagogical matters. This results in very little transfer of knowledge and experience with negative results on quality. There is also little communication between courses, both vertically and horizontally resulting in suboptimal course overlap. There can be too much or too little overlap leading to inefficient teaching. Even when transferring courses there is very little transfer of experience, which precludes the possibility of continuous improvement and causes unnecessary workloads for teachers.

The lack of collaboration among students

Many students study as individuals and do not capitalize on the immense opportunity for learning by collaborating with their peers. This has negative implications for learning, a sense of community and reduced training in collaborative skills which is increasingly emphasized as an indispensable skill for the modern employee.

The lack of collaboration between students and faculty

The overwhelming part of the communication between students and faculty is unidirectional. This naturally leads to the problem that teachers do not really know what the students understand and do not really understand how students behave. There is also a very large social gap between scientific staff and students which reduces the likelihood that they will seek help. Together the culture impedes bidirectional communication which is necessary for efficient communication. Improved collaboration will also lead to a stronger sense of belonging to the scientific community.

The lack of proven pedagogical practices

The limitations of the traditional lecture format has been demonstrated for many years and there has been a tremendous development alternative methods of teaching with proven effectiveness. Yet, the overwhelming fraction of teaching is presented in the traditional lecture format.

The missing link between study programs and course content

Increasingly, reports emphasize the importance of developing the general skills of the students (collaboration skills, presentation skills, writing skills, etc..). Still, there is no mechanism which ensures that these are skills are develop in an effective manner. Ideally, there should be a focus on this from the start of the program with a continuous development throughout the degree. The lack of connection with the study program is also a factor which allows course to develop independently reducing an efficient overlap between courses.

This analysis led to the formation of the four working groups of the center

- Collegial culture
- Student culture
- Pedagogical practices
- Study program design

Organization

DeltaQ will have an executive committee consisting of the four work group leaders. This committee will meet monthly to ensure coordination of projects. Magnus Lilledahl also functions as the center leader.

The work group leaders are

- Magnus Lilledahl (Leader, student culture)
- Erik Wahlstrøm (Study program design)
- Reidar Lyng (Collegial culture)
- Jonas Persson (Pedagogical practices)

The individual work groups will meet according to the needs of the projects of the work groups. The work group leaders are responsible for work group coordination and reporting to the other working groups.

An annual seminar will be conducted with all participants including the external advisory board and key stakeholders (deans, heads of department etc.).

The current external advisory board (tentative):

- Carl Wieman (Stanford)
- Torgny Roxå (Lund)
- Jonathan Reams (NTNU, IPL)

A student advisory board will be formed. This will consist of 10 random (to ensure representativeness) students, 2 from each year, and 3 students selected based on their particular interest in educational development.

The center will maintain a webpage with information about ongoing projects and published results.

Work groups

The activities of the DeltaQ are divided into four **work groups**:

1. **Collegial culture.** Develop a collaborative culture with a focus on quality
2. **Student culture.** Develop a culture which optimize learning and development of students.
3. **Pedagogical practice.** Research the effectiveness of teaching methods and work towards the implementation of these in courses. Foster a scientifically based choice of teaching methods.
4. **Study program design.** Develop an educational policy where overall and specific program goals are clearly integrated into courses. A sensible and efficient collaboration between study program council and department with a clear division of responsibility will be established.

The planned activities of each work group are described below.

WG1 Collegial culture

There are three planned projects in this work package

- Understanding collegial culture
- Teaching teams
- Course transfer
- Quality assurance system

Project: understanding collegial culture

A necessary step in developing the collegial culture is to describe the current culture. This will provide a starting point for development projects as well as form a baseline for monitoring the development of the

culture. This project is a collaboration with Thomas Berker at the department of interdisciplinary studies of culture (ISC). The study will consist of interviews and questionnaires for faculty. A possible extension is also to study the connection between beliefs and actual praxis.

ISC will also formulate master projects targeted towards these projects.

Project: Teaching teams

A project has been started to improve collaboration between the introductory courses provided by the department of physics. The effectiveness of this project will be evaluated by interviews and questionnaires with the participants.

Project: Course transfer

Courses should undergo a continuous improvement. By structuring the transfer of courses, the pedagogical philosophy is made explicit, and improved transfer of experience and knowledge is achieved. This will also help teachers against delaying course preparation, likely improving the quality of the course design.

Project: Quality assurance system

Current quality assurance systems are better designated as student opinion reporting system. It can be argued that the information that can be derived from the responses do not easily provide information about the quality of the learning and there is no system in place for how the data is supposed to be used to generate action and change.

WG2 Student culture

What describes the best student culture is not fixed but some example traits of the desired culture could be:

- Engagement in the study program
- A collaborative culture
- A sense of identity
- Confidence to challenge
- Low thresholds to approach faculty
- A pro-active, conscious approach to learning (meta-cognition)
- A constructivist understanding of learning

Things that can affect the culture:

- Assessment
- Peer activities
- Individual motivation
- Teaching methods
- Explaining rationale for learning activities

The main goal of this work group is to initiate activities that foster the desired culture.

Project: Understanding culture

The first step in modifying the existing culture is to understand the existing culture. We will conduct a series of interviews with current students to better understand the existing culture.

Project: Study technique

Study technique, the ability to most efficiently extract, retain, and link information gathered through learning activities, is essential. This is especially true in a life-long learning perspective. There is a widespread notion that what you learn at the university is to learn. But this is at best a random process, which is not optimized.

Study technique, like any other skill, is not something that you can be told how to do, but something that needs to be developed through continuous exercise.

Traditionally it is problematic that efforts to develop study technique are separated from course material, and therefore not perceived as important or at best valuable but not something that can be prioritized.

We will investigate the introduction of study technique as an integrated part of a course and use relevant course material as examples.

Project: Mentoring

Mentoring is a way to break down barriers between students and faculty as well as provide counselling. However, it is important to put some quality content into these activities to maximize effect.

A mentoring program will be reinstated in the fall of 2016 for the bachelor program in physics (John Ove Fjærestad is responsible for the organization).

Students experiences will be studied through questionnaires and experiences from faculty through interviews.

Project: Exchange students

NTNU has many exchange students that go abroad. This represent an enormous resource for instructional practices around the world. We will establish a system to bring together exchange students with relevant faculty so the students can share their experiences. This will also represent a step in breaking down barriers between students and staff.

WG3 Efficient learning activities

Project: Concept inventories

We will work to implement the use of concept inventories as a standard procedure in courses. This will enable a scientifically founded basis for evaluating new teaching methodologies. We will also work to develop new concept inventories for courses where no current concept inventories exists. Rolf Jonas Persson is responsible for this project.

The first step is to introduce concept inventories in all the service courses and the first four basic physics courses.

Project: Discipline specific educational program

Current educational development programs (PedUp) are quite general in nature. There is very little time for discussing actual implementation of learning activities and there is no time to discuss discipline specific questions. We will develop a discipline specific educational program that is focused on a specific discipline. The course will combine literature studies, and evaluation of own and others educational strategies. The idea is to foster a pedagogical knowledge, a conscious approach to teaching and more discussion around pedagogical aspects.

Project: Universal design for learning

Universal design is a pedagogical design concept where education is designed to meet the needs of all students with regards to learning style, background, and disabilities. The national office for universal design Universell is located at NTNU. Universell has recently led an EU project aimed at developing concrete guidelines for universal design. We will conduct a case study for the implementation of these guidelines. Universell is responsible for this project

Project: Videos for mechanical physics

As a continuation of the Vfk project we will design a series of general instructional videos which can be used in all the general physics courses which are taught by NTNU. Rolf Jonas Persson is responsible for this project.

WG4 Study program Design

The details of the activities of this group will be planned towards late 2016/early 2017 as the department already has an ongoing process on the introductory physics courses and it is not desirable to start too many processes simultaneously.

Below is an outline of the aspects that will be included in this work group:

- How to use a study program revision to maximize a positive effect on collegial culture.
- How to improve collaboration among department and study program council.
- Implementation of various frameworks into the study program (CDIO, UDLL, other concepts: sustainable assessment, robust learning...)
- Enhanced integration with stakeholders (industry, public sector, academia)

Timeline

		H16	V16	H17	V17	H18	V18	H19	V19
WG1 Collegial culture									
WG1-1	Understanding collegial culture	Interviews		Analysis	Publication				
WG1-2	Teaching teams	Implementation		Analysis	Report				
WG1-3	Course transfer	Implementation			Evaluation	Report			
WG2 Student culture									
WG2-1	Study technique	Implementation		Analysis	Publication				
WG2-2	Mentoring	Implementation		Evaluation		Publication			
WG2-3	Exchange students								
WG3 Pedagogical practice									
WG3-1	Concept inventories	Implementation/develop		Development		Analysis	Report		
WG3-2	Discipline specific educational program			Developer	Implementation		Evaluation	Publication	
WG3-3	Universal design	Recruitment		Implementation	Analysis				
WG4-4	Instructional videos		Recruitment	Planning	Recording		Implementation	Analysis	
Study program design									
WG4-1	Create strategy			Development		Implementation	Report		
Administrative									
	Annual seminar		May		May		May		May

Evaluation

Specific activities have their own concrete evaluation of projects. In addition, we will measure overall effects on

1. Collegial culture through interviews and questionnaires
2. Student culture through interviews, questionnaires (CLASS), and studiebarometeret
3. Adoption of effective learning activities through analysis of current practice.

Resources

Costs per year (in 1000 NOK). See detailed budget description in attached file.

	Andel av stilling	Hours	NOK
Project coordinator	0,2		
Researcher	0,2		
Teaching assistants (students)		500	
Teaching assistand (PhD)	0,25		
Student board		100	
Transcription			100
Conference participation			100
Annual meeting			60
Lilledahl	0,2		
Wahlstrøm	0,1		
Persson	0,2		
Lyng	0,2		
Berker	0,2		