



# Quality in Norwegian Higher Education

A review of research on aspects affecting student learning

Crina Damşa, Thomas de Lange, Mari Elken, Rachelle Esterhazy, Trine Fosslund, Nicoline Frølich, Elisabeth Hovdhaugen, Peter Maassen, Monika B. Nerland, Yngve T. Nordkvelle, Bjørn Stensaker, Cathrine Tømte, Agnete Vabø, Jannecke Wiers-Jenssen & Per Olaf Aamodt

Report 2015:24

**NIFU**



UiO **Institutt for pedagogikk**  
Det utdanningsvitenskapelige fakultet



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# Preface

This report is produced in the framework of the project “Quality of Norwegian Higher Education: Pathways, Practices and Performances”, funded through the program Research and Innovation in the Educational Sector (FINNUT), Research Council Norway (RCN). The focus of the study is on exploring quality issues related to the *educational* provision of higher education. The overarching questions in the project are: What factors and mechanisms are important for realizing the aims of quality work in Norwegian higher education? What is the relationship between structural/systemic and institutional conditions, and educational practices?

In this first report from the project, the aim is to position the study with respect to the international research-based literature in this area, and to identify factors and mechanisms indicated by the relevant literature as important contributors to the enhancement of quality in higher education. A second aim is to identify knowledge gaps in the existing literature.

The report is written by project members from four institutions: the Department of Education at University of Oslo (IPED/UiO), University College in Lillehammer (HiL), Nordic Institute for Studies in Innovation, Research and Education (NIFU) as well as the University of Tromsø, The Arctic University of Norway (UiT). The following people have contributed to the report: Crina Damşa, Rachele Esterhazy, Thomas de Lange (all IPED/UiO), Mari Elken, Nicoline Frølich (both NIFU), Trine Fosslund (RESULT/UiT), Elisabeth Hovdhaugen (NIFU/IPED/UiO) Peter Maassen (IPED/UiO), Yngve T. Nordkvelle (HiL), Monika B. Nerland (IPED/UiO), Bjørn Stensaker (NIFU/IPED/UiO), Cathrine Tømte, Agnete Vabø, Jannecke Wiers-Jenssen and Per Olaf Aamodt (all NIFU).

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Oslo, October 2015

Sveinung Skule  
Director

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Head of Research



# Contents

<b>Summary</b> .....	<b>7</b>
<b>Sammendrag</b> .....	<b>12</b>
<b>1 Introduction</b> .....	<b>17</b>
1.1 Background for the study.....	17
1.2 Methodological choices and concerns .....	18
1.3 The structure of the report.....	19
<b>2 The Norwegian higher education system in a European context</b> .....	<b>20</b>
2.1 Quality – a key idea behind reform and modernization attempts.....	20
2.1.1 Changes in the governance of higher education systems.....	21
2.2 Key inputs and outputs of the Norwegian higher education system .....	29
2.2.1 Recruitment patterns.....	29
2.2.2 Admission and selection.....	30
2.2.3 Completion and drop-out.....	30
2.2.4 Internationalization.....	32
2.2.5 Employability and relevance.....	33
2.2.6 Student satisfaction.....	35
2.2.7 Academic staff's views .....	37
<b>3 Teaching, learning and assessment</b> .....	<b>38</b>
3.1 Introduction .....	38
3.2 Pedagogical approaches.....	39
3.2.1 Lecturing.....	39
3.2.2 Seminars and organized discussions .....	40
3.2.3 Student-centered approaches .....	41
3.2.4 Research in the Norwegian context.....	43
3.3 Assessment and feedback practices .....	47
3.3.1 Principles of productive assessment feedback .....	48
3.3.2 Learning to give and receive feedback .....	49
3.3.3 Research in the Norwegian context.....	51
3.4 Teaching and learning in technology-rich environments .....	51
3.4.1 The “where” and “when” of technology-rich teaching and learning environments.....	52
3.4.2 Changing teaching practices .....	53
3.4.3 Technology and pedagogics in campus-based settings.....	54
3.4.4 Quality aspects in online learning including MOOCs.....	55
3.4.5 Research in the Norwegian context.....	57
3.5 The significance of disciplinary differences.....	58
3.6 Aligning practices within course designs and disciplinary contexts .....	59
<b>4 Conclusions and research implications</b> .....	<b>61</b>
4.1 The framework conditions and key outcomes of the Norwegian higher education system .....	61
4.2 Mechanisms and drivers of quality in teaching and learning activities.....	62
4.3 Quality work as interlinking micro, meso and macro perspectives .....	64
<b>References</b> .....	<b>65</b>



# Summary

The aim of this first report from the project “Quality in Higher Education in Norway” is to position our study in relation to the international research-based literature in this area, and to identify what factors and mechanisms the relevant literature points to as important contributors to the enhancement of quality in higher education. “Quality” is a complex and multidimensional concept. In this report we focus on educational quality, more specifically, the characteristics of educational arrangements and practices that are found conducive to student learning. The second aim of the report is to identify gaps in the existing literature.

The literature reviewed includes research related to quality aspects both at a political level, an institutional level and a program level. It must be underlined that the review undertaken in this chapter cannot be labeled a “systematic review”. Rather, it can be characterized as a “purposeful review” – aimed at addressing certain issues related to quality in higher education, where we focus on concepts that reflected in current debates regarding quality in Norwegian higher education. In this review, we have emphasized recent studies published in the main peer reviewed journals as well as highly-cited contributions in the field. It should be noted that while a considerable number of studies have been included, we are aware of potential shortcomings due to publications through other outlets, the English language focus in international journals which means that certain regions are overrepresented, as well as disciplinary differences. Furthermore, summarizing studies on “quality” is a challenging task, as the quality concept is poorly defined, and potentially useful studies may have been published using labels other than “quality”.

Methodologically, we have tried to deal with some of these challenges by entering the review process as a collective. By holding regular meetings and also working together in smaller groups we have endeavored to cover key perspectives and contributions, and to engage critically in discussions about how to interpret the research found.

## **Framework conditions**

“Quality” as a concept is closely related to the primary processes in higher education, and the experiences of students and staff. However, quality in higher education is also dependent on a number of framework conditions, including funding, system structure, leadership, recruitment patterns and selection criteria.

During the last decade the Bologna – as well as the Lisbon – process has been an important reform driver in Europe, including Norway, where many reforms have been “added” to the process at a domestic level. In Norway, changes in both the funding and in the governance of the sector can be noted; initiatives which have often been in line with the EUs modernization agenda. In Norway, the Quality Reform introduced a new degree structure and organization of study programs, as well as new

educational and assessment methods. Furthermore, systematic follow-up of quality work was introduced with the establishment of a new quality assurance body – NOKUT. However, the relationship between changes in funding and governance, and the quality improvement of the primary processes, is less clear. Part of the explanation for this is related to the fact that these reform efforts often have a broader agenda than educational quality, where multiple aims and instruments can sometimes be competing.

While leadership and governance have been issues high on the Norwegian reform agenda with respect to the organizational level, it appears that the issue of educational leadership on study program level has not. A number of studies emphasize that there is a lack of close-up leadership at the program level, and that the responsibility for coordinating the study program may be more in the hands of the administration than the academic leadership. Overall, the role of academic educational leadership in quality enhancement has barely been studied in the Norwegian context.

While external evaluations stemming from the national quality assurance system are followed up at the institutional level, it still is not clear what impact such follow up has on the quality of teaching and learning. Hence, whether external quality assurance impacts the pedagogical content in study programs remains an open question. These issues undoubtedly also have links to the issue of academic leadership, and the responsibility for and involvement of staff and students in the follow-up activities. It can be assumed that the way “quality work” is organized within universities and colleges, and how it is governed and led, also affects the outcome of the process. Another open question is the role of infrastructure, as architecture and productive learning environments can be important for students’ learning. Student-centered approaches are often conditioned by a learning environment that enhances dialogue and active student learning, and this may be at odds with the way many current buildings are designed and infrastructure is developed. The application of technology can probably play a key role in stimulating dialogue and student activities, even in circumstances of a less “fitting” physical infrastructure. However, this assumption still needs to be tested empirically.

### **Recruitment, selection and drop-out**

Norway bears many similarities to other countries that have expanded their higher education system, for example regarding the sheer number of students admitted into the system in recent decades. This expansion is very much a result of a policy imperative, as well as a general demand for higher education. However, the effect of this expansion is also well known: first, increased variation within the student population makes it more difficult for higher education institutions to identify clear academic standards to use as point-of-departure for the newcomers. Second, the increased number of students entering into the system tends to reduce the funding per student (even if the general funding of the sector increases), making it challenging for the institutions to meet the needs of each student. In our review, we also found that academic staff in higher education were dissatisfied with access to teaching assistants, which might be related to resource constraints. Third, increased access to the system and widening participation may increase the drop-out rate and lower the completion rates in the system.

The changes in the funding system introduced with the Quality Reform led to an increase of study point production, but there has not been a substantial positive effect on drop-out rates. The issue of drop-out and completion has received much political attention during recent decades, and is still considered a key quality challenge of higher education systems and institutions. However, causes of drop-out deserve more reflection, and include issues that go beyond “quality” as such.

The Norwegian system is adapted to a lifelong learning perspective, where education contributes to the democratic values in society. The system also reflects democratic and egalitarian values that emphasize equal access, free education and a comparatively generous scholarship and loan system. The system is flexible and permits students to combine studies in universities and university colleges. In some fields, the so-called “Y-way” provides access for students with vocational secondary education. This flexibility has led to considerable heterogeneity and variation. Norway seems to enjoy a relatively smooth transition between higher education and work. Furthermore, from the perspective

of “life-long learning” , one could even argue that the flexibility in the Norwegian system – partly responsible for drop-out rates as well as completion rates – may be perceived as a positive characteristic of the system.

### **Internationalization at various levels**

The literature indicates a basic assumption that internationalization contributes to quality enhancement. Norway is engaged in a number of internationalization activities, in the form of student mobility abroad and so-called internationalization at home. As Norway has few internationally prestigious institutions, it has been questioned whether Norway is able to compete for the best talent.

It is evident in existing research that internationalization activities in Norway vary substantially, depending on discipline, study level, and institution. Shorter, professionally-oriented study programs are generally not very internationalized, whereas natural sciences in the universities are characterized by high degree of internationalization. Studies have shown that international students are rather poorly integrated, and that academic staff find it challenging to customize study programs for international students.

### **Academic content**

Norwegian higher education graduates usually get a job, and studies show that employers are in general satisfied with the skills and competencies of the graduates. Academic staff, however, are somewhat more skeptical about increased external demands on academic content.

A large majority of Norwegian students are satisfied with the quality of the education they receive, although they also point out areas for improvement. Two issues highlighted in this respect are the need for more feedback and the need for a more regular and systematic dialogue between teachers and students in the learning process. While students seem satisfied with the academic quality, they are less satisfied with the didactical framing of their studies.

Academic staff in Norway appear to prioritize research to a higher degree than in other countries, a pattern reflected in the evenly distributed focus on research across various positional categories.

### **Student-centered learning approaches**

We find in the literature that the concept of quality is closely linked to student learning and the conditions that facilitate this – including organization of study programs, the approaches to teaching and learning as well as assessment practices. A number of pedagogical approaches to teaching and learning in higher education can be identified in the literature. Several studies have criticized the traditional lecture format for its passive nature that fails to keep students focused. Active elements in the form of digital sources, interactive components, and questions are suggested as means to tackle this. A theme throughout most of the literature is the importance of facilitating ways in which students can take a more active part in the construction of knowledge in their studies. In our review we identify a range of student-centered approaches and a number of positive outcomes of students’ learning associated with problem-based learning, case-based learning, project-based learning and inquiry-based learning.

Conscious use of student-centered learning methods increases the students’ portfolio of competencies:- they learn to collaborate and they increase their motivation. These methods may also provide interesting links between education and research. However these approaches do not necessarily help the learning of academically weaker students who may struggle in such learning contexts. At the same time, the literature review identified some common drivers of quality within student-centered approaches. Students need help with refining queries, hypotheses, and arguments, and the teacher functions as a guide and supervisor. Various studies point to the positive effects of engaging students in collaborative discussions and peer learning. However, teacher-led activities (in lectures and online environments) may be more efficient for the introduction of themes and distribution of information.

Although no existing data shed light on the prevalence of the various approaches that can be found in Norwegian higher education, there is undoubtedly much pedagogical variation within the sector. However, quality is most likely not only just an issue of finding adequate combinations in pedagogical approaches. The chosen organization of study programs is an important element in creating conditions for productive learning. In Norway, there is little empirical data on the relationship between pedagogical practice, forms of engagement, teaching and learning approaches, and assessment practices.

### **Feedback and assessment**

Most of the existing studies suggest that many assessment and feedback processes are characterized by top-down information from the lecturer, and that peer learning – a key feature in a more student-centered learning approach – is often lacking. Assessment and feedback is also hampered by tacit knowledge as to how academic standards are understood. Making such standards explicit and developing different student-centered feedback practices can enhance student self-regulation and motivation. However, this seems dependent on systematic training of students and their teachers, not least acknowledging that there might be variations as to what kind of assessment and feedback practices should be employed in the various stages of the study process. It is argued that giving clear and explicit guidance on feedback helps students integrate the received feedback effectively in their learning process. Accordingly, feed-forward has been identified as the most productive type of feedback, as it provides information about where the student stands and the next step a student should take to reach his or her goals. Moreover, feedback that focuses on specific aspects of the learning task instead of referring to self-related aspects of the learner, tends to be more productive.

### **Technology and learning**

This is a theme that has experienced considerable growth in recent years, both with emphasis on how technology can solve challenges in educational practices, and the development of new technologies for such purposes. The field is large and can be difficult to limit, with concepts such as online/offline learning, blended models, synchronic versus asynchronic modes of delivery, to name a few.

Technology might play an important role in both student-centered learning approaches and in various assessment and feedback practices, but research suggests that it is not the technology in itself, but the way technology is applied that is crucial for the outcome. For example, despite the many positive effects technology can have – stimulating students to be active learners and to strengthening connections between students and staff – technology might also be used in ways that force students into a more consumer-oriented and passive learning mode. Moreover, the way digital technologies are used seems in part to be related to the participants' belief systems. Research indicates a relation between tool use and conceptions of teaching, where teachers with a transmission focus tend to implement technology as supplementing tools, while student-centered teachers display more innovative approaches. Again, it seems that variation and a careful incorporation of technology in the study program is of key importance, and that more blended learning settings are becoming more and more popular, implying that comparison of “new” versus “traditional” approaches perhaps is becoming less relevant.

### **No magic formula for educational quality**

What do we know about the factors that contribute to the quality of Norwegian higher education on the basis of our literature review? Much knowledge is indeed available, although we should also acknowledge that there are important gaps still to be covered, and that we do not yet have a full understanding of the different ways in which the abovementioned factors may affect quality.

As an organizing unit, study programs have multiple functions with regards to understanding quality in higher education. Different pedagogical approaches are also embedded in specific institutional and domain-specific contexts. Different institutions, disciplines and knowledge domains operate with different expectations to students, relationships between learners and teachers, the balance between knowledge and skills, etc. For this reason, a generalizable notion of “quality” remains rather elusive.

No approach is successful purely on its own. All pedagogical formats come with opportunities and challenges, and all can be both advantageous and disadvantageous for student learning, depending on the students' wider learning context. Hence, a central issue for program quality is to secure productive relations between different activities and sites for learning in the program/course, and to use different pedagogical approaches strategically to achieve the overall aims of the program.

We know quite a lot about what matters for quality in different types of activities and about the general principles for organizing teaching and supporting learning. However, issues of which we have limited knowledge are how activities play out in the specific contexts of educational programs and courses, as well as what challenges teachers and students experience in this regard. Few studies are available that look into the educational processes as they unfold, and even fewer exist in the Norwegian context. Moreover, while domain-specific differences generally are acknowledged, few studies have explored such differences in educational practices and what they imply for teaching and learning. More knowledge about these issues is important also to understand the relationship between generic and specific competencies, and how generic skills can be developed in domain-specific activities.

We thus suggest that future research in this project should address teaching and learning in different pedagogical formats more systematically, both as stand-alone activities and with an eye to how they can be fruitfully combined in programs and courses. Moreover, these issues should be explored across a variety of knowledge domains. Furthermore, while the literature identifies important elements of the framework conditions, less is known about the internal mechanisms that contribute to quality enhancement, such as organization and leadership, and strategy and resource allocations. An important aim is also to examine the relationships that can be found between micro level processes, external and internal processes, and the institutional and organizational conditions where these mechanisms are at work.

# Sammendrag

Denne første rapporten i prosjektet Quality in Norwegian Higher Education har som mål å identifisere de faktorer og mekanismer som er viktige for å nå målene til kvalitetsarbeidet i norsk høyere utdanning. Dette bidrar til å posisjonere prosjektet på det internasjonale forskningsfeltet, og til å identifisere eksisterende kunnskapshull. Rapporten er basert på en grundig gjennomgang av forskningslitteraturen, men skal likevel ikke forstås som en systematisk kunnskapsoversikt. Litteraturen som presenteres er særlig valgt med henblikk på å belyse kvalitet på ulike nivåer, med særlig vekt på faktorer som bidrar til studentenes læring.

Den trekker på eksisterende litteraturoversikter og artikler, gjerne hyppig siterte, fra velrenommerte tidsskrift. Selv om vi har gått igjennom en betydelig mengde litteratur vil det alltid være en utfordring å inkludere alle viktige studier. Fokus på engelskspråklig litteratur betyr eksempelvis at forskning fra spesifikke regioner vektlegges. Det å oppsummere studier om kvalitet er en utfordring da dette er et løst og dårlig definert konsept, noe som kan bety at noen interessante og relevante studier kan gå under radaren fordi andre begrep brukes.

Metodisk har vi møtt disse utfordringene med at vi har jobbet tett sammen gjennom hele prosessen, der vi har hatt jevnlig møter med hele gruppen, samt diskusjoner også i mindre grupper for å sikre at sentrale perspektivene er dekket, og for å kritisk diskutere litteraturen vi har fokusert på.

## Rammebetingelser

Kvalitet i høyere utdanning formidles gjerne gjennom erfaringer fra studenter og vitenskapelig ansatte. Kvaliteten vil imidlertid preges av en rekke eksterne betingelser som finansiering, arbeids- og funksjonsdeling mellom institusjoner, ledelses- og ressursfordeling, så vel som rekrutteringsmønstre og seleksjonskriterier.

Når det gjelder den politikken som har betydning for kvalitet i norsk høyere utdanning, har ikke minst de europeiske initiativene, Bolognaprosessen og Lisboa prosessen, vært viktige drivkrefter bak en rekke reformer som har påvirket betingelsene for kvalitet. Den såkalte Kvalitetsreformen innebar en ny gradsstruktur og en ny organisering av utdanning i studieprogram, samt innføring av nye undervisnings- og evalueringsmetoder. Reformen bidro også til institusjonalisering av ulike former for oppfølging av studiekvalitet, blant annet gjennom opprettelsen av et nasjonalt organ for akkreditering og kvalitetssikring av utdanning (NOKUT). Kunnskapen om studieprogrammer er imidlertid mangelfull, likeledes sammenhengen mellom kvalitet i høyere utdanning og reformer gjort innen styring og finansiering. Vi har indikasjoner på at administrasjonen spiller en viktig rolle i organisering og «drift» av studieprogram, og at faglig ledelse anses som mindre viktig. I norsk sammenheng har det knapt nok vært studert hvilken betydning ledelsen – inkludert ledelsen for de individuelle studieprogrammene – har for kvalitet i læring og undervisning. I det hele tatt er spørsmålet om hvordan kvalitetssikring

"treffer" organisasjonen, interessant å forfølge i videre forskning. Det kan antas at måten kvalitetsarbeid er organisert innenfor universiteter og høyskoler, og hvordan den er styrt og ledet, også påvirker utfallet av prosessen.

Eksisterende studier tyder på at NOKUTs evaluering og oppfølging av studiekvalitet følges opp på institusjonsnivå, men vi vet lite om hvordan dette skjer, og hvilke konsekvenser det har for kvalitet, ikke minst i forhold til helhet og progresjon i studieløpet. Et ubesvart spørsmål er hvordan disse eksterne kvalitetssikringsprosessene er knyttet til utviklingen av det pedagogiske innholdet i studieprogrammene. Måten det interne kvalitetsarbeidet organiseres på, kan antas å ha en effekt på resultatene, noe som tilsier at betydningen av utdanningsledelse, samt involvering av ansatte og studenter, er noe som bør undersøkes nærmere. Det samme gjelder betydningen av fysiske omgivelser, da arkitektur og etablering av gode læringsomgivelser kan være viktige for studentenes miljø og læring. Spørsmålene knyttet til bruk av teknologi er her av sentral interesse, men har vært forholdsvis lite forsket på i norsk sammenheng. Mye tyder på at vi i norsk sammenheng mangler en helhetlig tenkning om læringsmiljø og kvalitet, og at dette er temaer som bør undersøkes nærmere.

### **Rekruttering, seleksjon og frafall**

Som i de fleste europeiske land har høyere utdanning vært preget av en kraftig ekspansjon i antall studenter. Sammenlignet internasjonalt, kjennetegnes det norske systemet ved relativt svak seleksjon og fleksible opptakskriterier. Det norske systemet legger dessuten vekt på demokratiske mål som lik rett til utdanning, og understøttet dette i form av gratis utdanning og relativt sjenerøse studiestipend- og låneordninger. Mange studenter tas opp i høyere utdanning, det er relativt bred sosial rekruttering, og det er mulig og vanlig å kombinere universitets- og høyskoleutdanning. Gjennom Y-vegen godkjennes yrkesfaglig utdanning som grunnlag for opptak. Dette bidrar til en relativt heterogen studentmasse som fører til kvalitetsutfordringer i form av frafall og «uryddige» studieløp, om enn med store variasjoner mellom studieprogram. Innføringen av et insentivbasert finansieringssystem innenfor rammen av Kvalitetsreformen kan nok ha bidratt til at den enkelte student tar flere studiepoeng på kortere tid, men finansieringssystemet har ikke bidratt til mindre frafall. I internasjonal sammenlikning er det fremdeles slik at studentene fullfører sent. Det norske systemet bidrar uansett til en høyt utdannet befolkning som, så langt, får god avkastning på utdannelsen sin i arbeidsmarkedet, gitt at utdanningen er gratis. Systemet er tilpasset behovene for livslang læring og bidrar dessuten til å innfri demokratiske mål om bedre fordeling av utdanningsressursene. Fullføring har dermed sine begrensninger som mål på kvalitet.

### **Internasjonalisering på ulike nivåer**

I tråd med alle politiske intensjoner er høyere utdanning preget av mer internasjonale aktiviteter, både i form av studentmobilitet og såkalt internasjonalisering «hjemme». Mange utenlandske studenter kommer hit på kortere eller lengre opphold, men blant annet fordi vi har få internasjonalt kjente akademiske institusjoner, er det ikke nødvendigvis de mest talentfulle studentene som kommer hit.

Det er imidlertid store forskjeller mellom fag, studienivå og institusjoner med hensyn til hvorvidt de tar del i internasjonale aktiviteter, i form av læring i utlandet, erfaring med andre kulturer og språk, kontakt med utenlandske lærere og studenter, osv. Særlig kortere profesjonsrettede studier i høgskolesektoren er lite preget av internasjonalisering, mens naturvitenskapelige fag ved universitetene er de mest internasjonale.

Utenlandske studenter synes dessuten å være lite integrert. Selv om vi har lite kunnskap om hvordan utenlandske studenter bidrar til kvalitetsheving i høyere utdanning, kan dårlig integrering ses som en kvalitetsutfordring fordi man mister fordelene med internasjonalisering. Undersøkelser viser eksempelvis at fagpersonalet til dels ser utfordringer med å tilrettelegge for internasjonale studenter og tilpasse studieprogram. Av slike og andre grunner er forholdet mellom internasjonalisering og kvalitet et tema som også bør undersøkes nærmere.

## **Faglig innhold**

Studenter med grad fra norsk høyere utdanning får seg arbeid, og undersøkelser viser at arbeidsgiverne og studentene er relativt godt fornøyd med relevansen av studiene, men det er betydelige forskjeller mellom fagområder. Vitenskapelig ansatte derimot, rapporterer skepsis til økte eksterne krav for arbeidsrelevans i studiene.

Majoriteten av studentene er også godt fornøyd med det faglige innholdet i studiene. Studentene er imidlertid mindre fornøyd med graden av faglig kontakt med, og tilbakemeldinger fra, lærerne. Fagpersonalet rapporterer på sin side at de legger stor vekt på å gi tilbakemeldinger, særlig ved statlige høgskoler. Ulike synspunkt på tilbakemelding mellom fagpersonalet og studentene reflekteres også i internasjonal litteratur.

I internasjonal sammenlikning ser vi at vitenskapelig ansatte i norsk sammenheng i noe større grad prioriterer forskning, noe som reflekteres i at tid til forskning er jevnere fordelt mellom ulike stillingskategorier. Vitenskapelig ansatte savner mer undervisningsassistanse enn deres kolleger i andre land.

## **Student-sentrerte undervisningsformer**

Organisering av undervisning og læringsaktiviteter har betydning for hvordan studentene lærer. Kvalitetsbegrepet bør derfor koples sterkere til studentenes læring og de betingelser som støtter opp under dette, som hvordan studieprogrammer designes, og hvordan det undervises og evalueres.

I dag er læring knyttet opp til mye spesialisert kunnskap som kan hentes fra mange ulike kilder. Dette har bidratt til utvikling og mer bruk av læringsformer som tar utgangspunkt i studentenes aktiviteter og bruk av teknologi. Den tradisjonelle forelesningsformen kritiseres i eksisterende studier for å fungere begrensende på studentenes læring og oppmerksomhet. Den blir hevdet å kunne virke passiviserende. Hyppigere tilbakemeldinger, bruk av digitale ressurser og mer vekt på interaksjon mellom lærere og studenter kan være mer gunstig for studentenes læring, likeledes kombinasjoner av små og store seminarer med rom for muntlig fremleggelse, litteraturgjennomgang, diskusjon og refleksjon. Det er mange studier som legger vekt på at studentsentrerte læringsformer (for eksempel problembasert, case-basert, prosjektbasert og undersøkelsesbasert læring) er positivt for studentenes læring. Flere studier, ikke minst i medisin, har i norsk sammenheng eksperimentert mye med slike læringsformer. Det er imidlertid vanskelig å skille skarpt mellom ulike student-sentrerte pedagogiske grep.

Bevisst bruk av student-sentrerte metoder synes å styrke bredden i studentenes kompetanse. Studentene lærer å samarbeide og blir mer motivert. Metodene kan også fungere som gode inntak til å kople forskning og utdanning. Undersøkelsesbasert læring er mer åpen og innebærer mer selvstendig arbeid med kunnskap enn de andre tilnærmingene. Den skaper stor studentaktivitet, og koplinger mellom undervisning og forskning. Metoden synes å resultere i bedre forståelse av kunnskap/teori for en del studentgrupper. Imidlertid tyder studier på at dette ikke nødvendigvis er den mest hensiktsmessige metoden for svakere studenter.

Selv om de ulike metodene skaper ulike typer læringsprosesser, har denne rapporten også identifisert noen sentrale kvalitetsdrivere. Uansett metode har studentene behov for støtte til å avgrense og løse problemer og konkretisere resultater av diskusjoner. Det er også behov for å følge opp prosesser ledet av studenter, og på lærersiden bistå i å organisere samarbeid mellom studenter.

Norske studier viser at studentenes læring preges av relasjonen mellom de særegne trekkene ved de ulike studieprogrammets kunnskapsdomener og studentenes interesser i domenet. Studieprogrammene, og hvordan de er organisert og tilrettelagt for disse læringsprosessene i samspill med studentene, er også et viktig inntak til å forstå kvalitet i høyere utdanning. Læringsprosessen er viktig, og her har vi fremdeles lite data i Norge om forholdet mellom pedagogisk praksis, former for involvering, undervisningspersonalets praksis og tilbakemeldinger. Dette understøtter behovet for flere studier av praksis – hva skjer i de ulike læringsarenaer, i møtet mellom studenter og lærere?

## **Tilbakemelding og evaluering**

Det er betydelig enighet i litteraturen at vurdering av studenter og tilbakemeldinger har stor betydning i studentenes læringsforløp. Likevel tyder undersøkelser på at evaluering og tilbakemeldinger gjerne preges av informasjon gitt ovenfra og ned der fokus på studentenes læring er mindre vektlagt.

Det finnes mange ulike typer feedback, fra oppgave- til prosessorientering, men ulike former for tilbakemelding bør tilpasses hva som skal læres. Flere studier vektlegger at tilbakemelding til studenter i hovedsak bør preges av å være konkret og fremadrettet og dermed tilrettelegge for studentenes egen læring og motivasjon. Studentene kan lære mye av hverandre, men det er en utfordring å legge til rette for dette. Å gi tilbakemelding er en aktivitet som studenter og lærere sosialiseres til over tid, og som tar tid å tilegne seg. Feedback fungerer ulikt avhengig av hvor i studieløpet studenten er. Tilbakemeldinger er gjerne mer styrende i tidlig studieløp, og mer reflekterende mot slutten.

## **Læring og teknologi**

Internasjonalt og i Norge har det vært forsket på hvordan bruk av teknologi kan forbedre eksisterende undervisningspraksis, bidra til mer studentaktivisering, og bedre læring på kursnivå. Det har vært utviklet ny teknologi for særlige oppgaver eller utfordringer i undervisningsøyemed.

Som tematikk er læring og teknologi vanskelig å avgrense. Det involverer aktiviteter on-line, off-line, "blended models", samt synkron og asynkron læring. Mye av forskningen er gjort av «entusiaster». Holdningene til lærerne betyr mye for hvordan teknologi brukes. Såkalte teknologirike læringsomgivelser preges, som undervisning og læring for øvrig, også av ulike pedagogiske tilnærminger, eksempelvis ulik grad av studentsentrerte tilnærminger. I undervisningen brukes teknologi som alt fra et tillegg til undervisningen til on-line møteplass for studenter på ulike steder. Teknologi kan skape økt studentengasjement, kritiske diskusjoner og økt student-lærer-kontakt. Sosiale medier kan ofte bidra til større studentaktivisering. Stadig nye teknologier som «klikkere» og student-respons-system brukes også i norsk sammenheng, og i evalueringssammenheng blir det stadig vanligere å bruke teknologiske løsninger.

De studiene vi har gjennomgått vektlegger at det er ikke teknologien i seg selv, men den pedagogiske tilnærmingen som har størst betydning for studentenes læring. Teknologibruk trenger imidlertid ikke å føre til økt studentaktivitet og engasjement: Bruk av video er også passiviserende. On-line-studier øker i Norge, og studiene vi har gått gjennom indikerer at studenter har ulike behov i slike studieforløp, som mer kontakt med andre studenter eller tettere direkte oppfølging av lærere. Også norske studier finner at mange studenter foretrekker ansikt-til-ansikt-kontakt fremfor ren digital interaksjon. En rekke norske studier konkluderer dessuten med at både studenter og fagpersonale anser det eksisterende IKT-utstyret som utdatert og/eller uegnet og motiveres derfor i liten grad til å ta i bruk mer teknologi i undervisningen.

## **Ingen magisk formel for studiekvalitet**

Hva vet vi om mulige forhold som påvirker kvaliteten på norsk høyere utdanning på grunnlag av denne litteraturgjennomgangen? Det er mulig å argumentere for at mye kunnskap faktisk er tilgjengelig, selv om vi også må erkjenne at det er viktige kunnskapshull som bør dekket. Vi har ennå ikke full forståelse for de mange årsaker til, og virkninger av, de faktorene som kan påvirke kvaliteten i høyere utdanning.

Studieprogrammet og dets innhold skal ivareta mange ulike mål. Alle pedagogiske tilnærminger vil av slike og andre grunner være preget av de muligheter og utfordringer læringskonteksten skaper. Høyere utdanning omfatter ulike læresteder, disipliner og kunnskapsområder som opererer med ulike praksiser og forventninger til studentene, til forholdet mellom student og lærer, og ulike avveininger mellom kunnskap og ferdigheter, etc. Det er derfor vanskelig å generalisere om studiekvalitet.

Vi vet ganske mye om mange av de rammebetingelser som har betydning for kvaliteten på utdanningene, og vi vet mye om generelle prinsipper for organisering og støtte av gode

læringsprosesser. Vi vet imidlertid mindre om hvordan læring utspiller seg i ulike program- og kurssammenhenger, og hvilke utfordringer studenter og lærere erfarer i så henseende. Det er behov for mer kunnskap om disse prosessene, ikke minst basert på empiriske studier i norsk sammenheng.

Selv om litteraturen peker på mange viktige innsatsfaktorer med tanke på rammebetingelsene for kvalitet, vet vi mindre om de interne mekanismene og prosessene som bidrar til kvalitet. Organisering, ledelse, og strategiske og ressursmessige disposisjoner er blant annet mekanismer som har betydning for kvalitet. Her er det viktig å skille mellom kvalitet som prosess og som produkt. Forholdet mellom eksterne rammebetingelser og interne prosesser er av mange grunner viktig å utforske nærmere, ikke minst med tanke på hvordan offentlige ressurser kan anvendes best mulig for kvalitet i høyere utdanning.

# 1 Introduction

## 1.1 Background for the study

This report is produced in the framework of the project “Quality of Norwegian Higher Education: Pathways, Practices and Performances”. The focus of the study is on exploring quality in relation to the educational provision of higher education. This means that issues related to the research activities of higher education institutions are less addressed in the project.

The overarching questions in this project are: What factors and mechanisms are important for realizing the aims of quality work in Norwegian higher education? And: What is the relationship between structural/systemic and institutional conditions, and educational practices? To find relevant answers to these questions, the project will both analyze existing data, and also launch new studies, especially at micro-level, for better understanding of current teaching and learning practices and how they are affected by structural and institutional factors. In this first report from the project, the aim is to position our study with respect to the international research findings in this area, and to identify factors and mechanisms the existing literature points to as important contributors to the enhancement of quality in higher education.

Our approach to quality is multi-dimensional, and we are not assuming that there is one best way forward or a simple answer to the question of quality (see also Harvey & Green 1993). On the contrary, by taking into account the diversity found within the sector concerning institutions, disciplines and subject areas, one of the basic assumptions of the project is that there can be several pathways to quality. Harvey & Green’s (1993) five-dimensional model of quality as exceptional, consistency, fitness for purpose, value for money, and transformation is a classic example of the diversity found in how quality could be interpreted and defined. However, one could also argue that this five-dimensional model overemphasizes the outcome dimensions of quality, and provides few leads to the factors that seem to be causing quality. To increase our understanding of this matter we need to know more about the processes of teaching and learning, more specifically, the teaching practices and the learning activities leading to certain outcomes. One of the basic assumptions guiding our study is that, most likely, there are a number of links and pathways to quality between teaching practices and learning activities, not least since the context in terms of institutional and disciplinary settings may affect how specific practices are played out. Hence, to be able to analyze these pathways properly, we need to link them to both practices and performances. By doing this, we also hope to identify possible commonalities and features that can contribute to enhancing quality – across the diverse landscape of higher education. While we acknowledge the challenge related to the latter ambition, we still underline the need to develop a stronger knowledge base concerning the issue of quality in higher education. We hope to develop an intermediate position between those that take a completely relativistic and

agnostic position with respect to quality, and those that take the position that quality is easily measured through some selected output indicators.

## 1.2 Methodological choices and concerns

As part of our ambition to develop a stronger knowledge base with respect to quality in higher education, we have started out by reviewing and discussing relevant international research on the topic. A key issue in this respect is how to define and select “relevant” research. As quality is a multi-dimensional concept, it is not easy to identify what research should be included or excluded from the review. One ambition is to include issues related to the different layers of what has been called “the quality chain within higher education” (Nordkvelle, Fosslund & Netteland 2013). This includes research related to quality aspects both at a macro level (political level), a meso level (institutional level) and a micro level (program level).

One challenge in this respect is how to deal with what could be defined as extrinsic and intrinsic factors affecting quality. While quality is usually assessed and related to the experiences of the students and teachers in the system, these processes are framed by a number of external factors decided upon by the political authorities, traditions, and existing structures in the higher education system. Hence, the level of funding for higher education, the structure and governance of the system, including the division of labor between the different universities and colleges in the system, the level of admission and the selection of students in the system, are all factors that condition quality to a greater or lesser extent. These factors provide an important context for understanding the many potential pathways to quality, although it is a difficult task to identify a direct causal link between factors, such as governance or funding, and quality. Although we do know that the funding level is an important facilitator for quality, more resources are not always a guarantee of improved quality. In chapter 2 of this report we describe the Norwegian higher education system and point to areas where it is distinctive, but also to where it is similar to systems in other European countries. The focus on Europe is due to the fact that the Norwegian higher education system adapted to the Bologna process in the early 2000s, and that this process has influenced the system considerably, not least concerning degree and program structures, teaching innovations, quality assurance etc. As such, chapter 2 sets the Norwegian system in a larger context, and points to potentially important characteristics and challenges of the system in a comparative perspective, especially related to input and output factors that may impact quality.

While chapter 2 sets the context, chapter 3 attempts to shed some light into the black box of teaching and learning, and how course design and practices related to teaching and learning affect quality. However, it must be underlined that the review undertaken in this chapter cannot be labeled as a “systematic review”. It could rather be characterized as a “purposeful review” – aimed at addressing certain issues related to quality in higher education. In the former type of review, methodological issues are in general given priority, and studies that do not conform to a given type of methodology are often excluded. As the current project also has an exploratory dimension, we have chosen a more pragmatic approach. An important point to be made here is that we in general in this chapter have understood “quality” as related to characteristics of educational arrangements and practices that are found conducive to student learning. By reviewing international and Norwegian research on teaching and learning in various pedagogical environments, we aimed at synthesizing what is known about mechanisms that can be said to foster and affect quality, as well as identifying gaps in need of further research. In the review approach we have considered and prioritized recent review studies of teaching, learning and assessment in various educational environments. This includes studies published in the main peer-reviewed journals for higher education research, specific topical journals that specialize on certain issues (such as assessment, quality assurance etc.). Primarily we have included publications from 2000 and beyond as well as highly-cited contributions in the field. In addition we have searched for studies that relate the pedagogical approaches to student learning. Other key words have also been applied, including “technology”, “ICT”, “assessment”, “feedback”, etc. The themes addressed in chapter 3 have been chosen both to reflect current discussions and trends

in Norwegian higher education and what are often considered important quality challenges within the sector. For example, surveys directed at students in the sector have repeatedly found that many students want more feedback during their studies, and more interaction with teachers (see, e.g. Studiebarometeret 2014).

While a considerable number of studies are included in our review, we are also aware of potential shortcomings related to our approach. As much higher education research is published in reports and books, important contributions may have been neglected, although we have tried to include such publication channels in searching for relevant literature concerning the situation in Norwegian higher education. It should also be noted that much of the literature identified and empirical settings reported on will have an Anglo-American focus, as literature available in leading English language research journals tend to stem from the US, UK or Australia. Whether these findings are always of relevance to the Norwegian context can be questioned. Another weakness that should be noted is that disciplinary differences easily can be downplayed in a review where the ambition of providing the “big picture” is prioritized. Finally, it once again needs to be underlined that identifying and analyzing studies on “quality” is a challenging task, as the quality concept is poorly defined and, therefore, studies that might address issues of interest to us may have been published under other labels.

Methodologically, we have tried to deal with some of these challenges by entering the review process as a collective. By holding regular meetings and working together in smaller groups, we have endeavored to cover key perspectives and contributions, and to engage critically in discussions about how to interpret the research identified. One outcome of this approach is that, as joint authors, we collectively take responsibility for the review.

### **1.3 The structure of the report**

As indicated above, the report has three chapters, with chapter 2 addressing quality issues related to input and output issues, while chapter 3 focuses on process issues, especially related to teaching and learning. In chapter 4, we highlight key findings from the review, and discuss the knowledge gaps and directions for future research.

## 2 The Norwegian higher education system in a European context

### 2.1 Quality – a key idea behind reform and modernization attempts

Although it is possible to argue that the last decades have been characterized by a “quality agenda in higher education” (Westerheijden et al. 2007), it is important to underline that a range of other issues and sub-agendas can be found behind the overall broad understanding of quality (Frølich et al. 2014). Hence, issues related to the effectiveness, efficiency, relevance and accountability of the sector are often included as part of this discussion (Frølich 2015). Our ambition is to focus on quality in a more narrow understanding – related to the academic content and to academic standards. This does not imply that the other issues are not relevant, but that in this chapter we focus more on the assumed links between the many reform and modernization attempts and a more academic understanding of quality. Before discussing the relationships between reforms and academic quality we will first briefly reflect upon the origin and meaning of the concept of quality.

Philosophical ideas about what quality *is* have a long tradition, going back to antiquity (Dahler-Larsen, 2008, Nordkvelle, Fosslund & Netteland, 2013). The separation of a phenomenon and the attributes of the phenomenon, e.g. a white rock and its “whiteness”, illustrate the separation of “essence” and “description” – or the ontology and epistemology of quality, first introduced by Plato, and developed by Cicero (106–43 f.Kr.) who first introduced the notion of “Qualis”. The desire to measure and quantify the epistemic dimension of quality is often attributed to John Locke (1632-1704), leaving the definition of or *essence* to esoteric or aesthetic interests. Dahler-Larsen (2008) argues that “quality” first was a matter for a discourse of the “informed” and wealthy classes. Through the ages of industrialization and modernization quality has become a phenomenon discussed by almost everyone and applied to just about “everything”.

The ontology of quality is a difficult matter to pinpoint. “Whiteness” can be described with extreme preciseness by color science, but the matter of selecting between “egg-white” or “mimosa” for painting a bedroom wall, is still a matter of taste and judgement (Waalder & Hardeberg, 2012). The philosopher and novelist Robert Pirsig described quality as something that happens, as a *process*, driven by an intention of *caring* (1994). Caring for the quality of a product initiated the desire for “quality control”, and Dahler-Larsen (2008) notes that by this twist of context, everyone involved in dealing with a good or service becomes a participant in the quality process. Students possess qualities, they experience quality, they deliver products that are assessed for their quality. The same goes for professors, administrators, directors and deans, as well as quality controllers. Handling quality matters has become a substantial part of the life in institutions: it has become “organizationalized”, according to

Dahler-Larsen (2008, p. 29). This complexity of relations between ontological and epistemological relations leads Peter Dahler-Larsen to suggest a pragmatic interpretation: "In the reflexive modernity, quality does not any longer necessarily refer to the constitution or appearance of a phenomenon, but rather offers us a way of handling the complexity of the matter"<sup>1</sup> (2008, p. 55). The notion of reflexive interpretation of quality implies that one has to serve the ontological dimension of quality by being explicit on how one describes, measures and calculates the epistemic dimension, from case to case, context by context, e.g. to clarify the quality of the position from where one describes the quality. This is captured in Wittek & Kvernbekk's conclusion: "We may have to settle for as explicit and accurate stipulations as possible, since no universal definition is to be had" (Wittek & Kvernbekk, 2011, p.683).

### **2.1.1 Changes in the governance of higher education systems**

#### **The emergence of quality assessment at national and European levels**

The interest in how to improve the effectiveness of the assessment and control of the quality of higher education emerged in the 1980s at the national level in various European countries. The background of this interest was formed by the attempts of governments to modernize the system-level steering mode with respect to higher education. The new mode represented a form of self-regulation implying that the higher education institutions would get more institutional autonomy in a number of areas, combined with a requirement that they would account for the way in which they would use this autonomy. This accountability included the area of the quality of higher education, in the sense that the higher education institutions were increasingly held accountable for the quality of the study programs they offered.

An essential characteristic over the last 30 years of the development of national policy agendas in this area is the notion of "policy-borrowing". As argued by Westerheijden et al. (1994, p. 22) the diffusion of the policy agenda on the quality of higher education started from three countries: the UK, France and the Netherlands. The last of these three has had a major influence on the development of quality assessment approaches in Norway and the other Nordic countries. The Netherlands itself had been inspired by the experience in US higher education with quality assessment, and built its own approach mainly on US program review models. In essence the Dutch approach consisted of the following components:

1. A system-level agency responsible for organizing formal quality assessment processes, and undertaking the external part of these processes.
2. The use of self-evaluation as the mechanism through which the quality of higher education programs is assessed internally on the basis of a set of guidelines produced by the national agency.
3. The use of "peer review" as the main mechanism through which the quality of higher education programs is assessed externally, with the "peers" taking the self-evaluation as the starting point for their work.
4. The use of a "site visit by the peers" to "check the self-evaluation report".
5. The interaction between the peers and the visited program on the findings of the peers.
6. The production, under the guidance of the secretariat of the national agency, of a final report by the peers, and the sending of the report to the assessed program/unit, with the report either being open, that is, accessible to a wider audience, or closed, that is, only available to the assessed unit/program.
7. A variety of consequences and follow up measures, ranging from closing the assessed program/unit, through a revisit in a relatively short time, to assessing the program/unit again in the next cycle of the whole process, that is, after 5-7 years.

This Dutch approach has been used and translated into different national contexts, including Norway, leading to a range of "variations on the same theme". The "same theme" means that the dynamics of

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<sup>1</sup> Translated from Danish by Yngve Nordkvelle

the “policy borrowing” and national translation processes led to the establishment of national quality assessment agencies and extensive cycles for assessing the quality of study programs based on peer review and site visits. This institutionalization at the system level of a formal approach to quality assessment of higher education had its impact “downwards” inside the higher education institutions, as well as upwards at the European level. Specific aspects of the institutional dynamics of the new quality assessment structures will be discussed later in this chapter. We will focus on the European level.

The involvement of the EU in the developments with respect to quality assessment has its roots in the Erasmus program. This program, starting in the late 1980s, was aimed at stimulating intra-European student mobility in such a way that at least 10 percent of all EU students in higher education would spend part of their studies at a higher education institution in a country other than their home institution. While the 10 percent target was never reached, the Erasmus program is still regarded as a success, and continues nowadays under the Erasmus plus program. Obviously, stimulating student mobility at the level intended by the Erasmus program raises issues with respect to the quality of higher education, including the recognition of credit points earned at the host institution. For that purpose a European credit point system was introduced in the framework of Erasmus, while also a debate was started on the need to set up a European level quality assessment structure for higher education. In the framework of this debate the Center for Higher Education Policy Studies (CHEPS), in the Netherlands, was invited to develop ideas for the introduction of a European-level quality assessment approach, and CHEPS advised to set up a multiple-accreditation system (Van Vught & Westerheijden 1993; Van Vught 1994). However, for various reasons the European Commission could not realize its ambitions in this area (Maassen & Neave 2007), and quality assessment of higher education remained a clear national and institutional responsibility at least until the early 2000s.

Since the early 2000s Bologna has created a new dynamic for European higher education with a resulting emergence of a European layer of governance with respect to higher education, and the development of a European-level dimension in quality assessment. Studies on the Bologna Process have established its relevance for national policy dynamics (Gornitzka 2006; Witte 2006), in particular in the two core areas – quality assurance and degree structure. Not least, the Bologna Process has led to internationalizing quality standards through the introduction of the Tuning project, the introduction of a qualifications framework for higher education, the establishment of ENQA and the European Standards and Guidelines for quality assurance (Kehm 2010). Of importance for this report is that while these initiatives can be seen as European-level initiatives, national policymakers, including in Norway, have in many cases used the Bologna Process to introduce other changes as part of the Bologna “package” (Gornitzka 2006).

An international survey carried out in 2008 indicated that the main contribution of the Bologna process *within* the institutions was viewed in terms of administrative organization and institutional capacity building as a response for new demands at the national level. This implies that the Bologna Process was not necessarily regarded as stimulating any substantial pedagogical reform (Neave and Veiga 2013). However, from a study program perspective major components of the Bologna Process, that is, the restructuring of the degree system, increased modularization, introduction of ECTS, quality assurance and learning outcomes, can be argued as playing a role in the practices of the institutions’ quality work. In a more indirect manner the changes introduced by the Bologna Process also set an important administrative frame for the operation of the study programs. For example, it has been argued that the restructuring of the degrees has led to a more applied focus, for instance, in law education, linked to the commitment to the Bologna Process (Taraldrud 2014). In Norway, the changes introduced by the Bologna Process were largely introduced through the Quality Reform, discussed later in this section.

### **Reforms in Norwegian higher education**

Higher education is always nested; while one can identify some convergence of reform agendas in Europe, this would not necessarily imply similar kinds of changes across other levels (Christensen,

Gornitzka & Maassen 2014). After the widespread focus of New Public Management (NPM)-related reforms from the 1980s that shaped both the public sector as a whole, the consequences of such processes have also gained substantial attention in research literature on higher education. Focus on new steering systems, new governance arrangements as well as NPM-related developments have gained substantial attention in the major journals in the area of higher education, being described as one of the main narratives in governance reforms with focus on markets, performance measurement and professionalization of management (Ferlie et al. 2009).

Traditionally, Norway was a country with relatively strong state steering, and until the 1990s, each of the institutions had its own legal act. Overall, while the system resembled that of the German system with a strong regulative tradition, the higher education institutions experienced considerable amounts of autonomy in matters of teaching and research (Maassen et al. 2011). However, debates about a more market-like governance model emerged already in the early 1990s in research literature (Aamodt 1990). From 1996 onwards, all institutions were gathered under a common legal framework, including a shift towards division between academic and managerial leadership (Dimmen and Kyvik 1998). The NPM-inspired developments in the 1990s implied that the relationship between the state and higher education institutions had moved from “peaceful co-existence’ to ‘evaluation and control” (Maassen et al. 2011).

In 1994, a reform of the non-university sector reduced 98 university colleges to 26 regionally-based university colleges (Kyvik 1999). The trend with mergers in higher education has continued and in recent years, there have been mergers further reducing the number of public institutions in Norway (Kyvik & Stensaker 2013).

The Quality Reform, introduced in 2003, was the central part of the Bologna process adaptation in Norway. Many of the changes introduced answered concerns that had been made locally about the too-costly and inefficient system (Kehm et al. 2010). The Quality Reform introduced a new quality assurance system and degree structure, and marked a change in the Norwegian higher education policy landscape (Aamodt et al. 2010; Bleiklie and Lange 2010; Dysthe and Webler 2010; Frolich et al. 2010; Kehm et al. 2010; Michelsen 2010; Serrano-Velarde and Stensaker 2010). The traditional pattern for introducing reforms in Norway has been based on consultation where the reform is gradually introduced after finding broad consensus on the changes suggested. The Quality Reform marked a shift in how the reform was carried out, as restructuring was proposed at a much faster pace (Bleiklie 2009; Bleiklie and Kogan 2007).

Overall, the ideas underlying higher education reforms in Norway in recent decades are similar to the general ideas applied in a number of other European countries. In general, institutional autonomy, decentralization, managerialism, and market have been high on the agenda. These changes were exemplified by the restructuring and mergers in the university college sector (Kyvik 2002; Kyvik 2008), and performance-oriented measures introduced with the Quality Reform – marking an increase in economic rationales and market logic (Maassen et al. 2011; Maassen et al. 2008). Despite a very similar stream of ideas to other European countries, the Norwegian system has arguably had some peculiar reform outcomes (or the lack of them at micro level), and a lack of coherence between reform aims and outcomes due to insufficiently taking into account local contextual factors in the implementation process (Maassen et al. 2011). Even after the Quality Reform that marked the introduction of more managerially inspired changes, it was argued that the reform agendas in Norway have had a more combined nature, and the shift towards NPM and the market was not as sharp as in other countries (Bleiklie and Kogan 2007).

The effects of the Quality Reform could also be noted at the study program level. The main aim of the reform was that “students should succeed”, and the reform prescribed a stronger institutional responsibility for students, closer follow-up and feedback, and new forms of assessment. A visible result was that students had to submit assignments during the semester and received feedback (Dysthe, Engelsen, & Lima 2007). In addition to the structural reform, introducing Bachelor’s and Master’s degrees in a more uniform nature, the new reform also led to a focus on interdisciplinary and

innovative study programs that could also be seen as more responsive and flexible towards the needs of the business sector (Kehm et al. 2010). At the same time, the former structure was considered superior by a considerable share of the professoriate: consequently, there was critique pointing out possible perverse effects of the funding system, scepticism towards new teaching and evaluation requirements, and concerns about reduced academic autonomy and too much focus on efficiency (Kehm et al., 2010).

### **Institutional governance and leadership**

The traditional views of academic governance in Norway stress the collegial nature of such structures; however, the literature would suggest that this has been increasingly under pressure (Bleiklie and Frølich 2014; Frølich 2005). Traditionally, higher education is known to be bottom-heavy and have loose coupling between various operational units, with central administrative leadership as rather weak (Clark 1983; Weick 1976). Reforms that have followed the ideas of NPM have focused on autonomy, management and leadership, also linked to the assumption that higher education can be seen as any public organization – that is, less special. The reforms that have been proposed have both introduced more autonomy in the traditional state control sense, but also increased reporting and accountability mechanisms (Christensen 2011), suggesting the need to examine quality assurance procedures (see next section).

What is less clear is how such shifts towards managerialism relate to increases in quality. The changes introduced have focused on strengthening executive leadership, external members on boards and governance structures, the introduction of strategic plans and audits as managerial instruments, appointed senior positions, and reduced collegial power (Ferlie et al. 2009). However, a literature review from 2007 suggested that there has been surprisingly little research on the actual relationship between for instance leadership and departmental effectiveness (Bryman 2007). The idea of higher education as less special can also be exemplified by various management ideas that have been imported to higher education from other sectors. However, this has led to varied success in terms of implementation, being occasionally conceptualized as “fads” (Birnbaum 2000) or “fashion” (Stensaker 2007), suggesting the fluid nature of such trends. This import of ideas that appear alien can also lead to the development of dual structures, where academic and administrative hierarchy follow different logics (Larsen et al. 2009), creating in principle a tension between administrative and academic authority within the organization. In Norway, this focus on dual vs integrated leadership has shifted over time. In 1996 the division of responsibilities was emphasized, while in 2005 the institutions received an option to decide themselves how they would choose to divide the two (Larsen et al. 2009). At the same time, what is clearer is that the administrative line has become more prominent in higher education institutions in Norway, and one has for instance noted increased professionalization of administration (Gornitzka and Larsen 2004), a trend that has also been identified worldwide (Waugh 2003). A recent study aiming at examining whether different institutional governance arrangements (elected vs appointed rectors) had an impact on how a number of Norwegian higher education institutions organized and implemented strategic initiatives, found that universities and colleges tended to be quite similar in their strategic approaches, regardless of their governance arrangements (Stensaker et al. 2013). A recent study on academic leadership at the department level in Norway suggests also that the values and visions of appointed department heads do not differ much from those held by former elected department heads (Møthe et al., 2015). Hence, it is possible to question whether formal changes in governance arrangements always result in significant changes.

### **Leadership in teaching and learning**

The literature on leadership of teaching and learning in higher education is very multifaceted and fragmented. As Bryman (2007: 704) noted some years ago in a major review on the characteristic of effective leadership in higher education, just to identify what should be included and excluded when studying leadership is a troublesome task. The literature tends to suggest that academic leadership responsibilities are very broad and that leaders of study programs need to display a range of competencies, and where these different competencies and priorities sometimes may clash. Bryman (2007: 705) also noted that research tends to ignore context and produce generalized lists of effective

behavior not recognizing the difficulties in transferring leadership behavior across organizational boundaries and contexts which may be very diverse.

Bryman (2007: 706) still identifies 13 aspects of leadership behavior that seem to be correlated to effective leadership, including the ability to identify and build a vision, to defend the leadership integrity, sense of direction etc. However, the review by Bryman (2007) was not able to identify the relative effectiveness of these aspects suggesting the possibility that several combinations of leadership behavior might be effective. Similar findings have also been identified in Australia where a large assessment of leadership capabilities in Australian higher education also demonstrated that those holding leadership positions in universities and colleges perceive a range of leadership activities and capabilities as important (Scott et al. 2008: 72).

A challenge with the studies mentioned above was that teaching activities were not studied in particular, but as part of the overall job of being an academic leader. In a more recent study focusing specifically on leadership responsibilities for teaching, Gibbs et al. (2009) identified nine clusters of leadership activities which to a considerable extent matched the lists provided by Bryman. Gibbs et al. (2009: 2) suggested that key clusters of effective leadership of teaching included the ability to build a community of practice, the ability to identify problems and turning them into opportunities, recognizing and rewarding excellent teaching, and involve students in the development process. However, due to the number of clusters associated with leadership effectiveness, Gibbs et al. (2009: 2) also suggested that "leadership associated with excellent teaching was found to be multi-faceted". In the same way as Bryman, Gibbs and colleagues recognized that different (disciplinary) cultures and traditions of higher education institutions (collegial, entrepreneurial, bureaucratic, corporate cultures) could impact effectiveness of certain leadership behaviors (see also Ramsden 1998, Scott et al. 2008: 76, and Caspersen and Frølich 2015). Interestingly, Gibbs et al. (2009: 3) argued that departmental size and national context played a less significant role in the effectiveness of leadership activities.

Not much research has been conducted on the relationship between, or the many combinations of, leadership activities and their effectiveness. One of the few studies that have addressed this issue suggests that there might be a strong relation between how leaders experience leadership and the way teachers experience leadership (Martin et al. 2003). An example is that when subject coordinators experience leadership as focusing on the nature and content of subjects and disciplines, the teachers tend to perceive the behavior as intrusive and imposed on them, while when subject coordinator focuses on the student experience, teachers tend to experience the behavior as more collaborative (Martin et al. 2003: 257). This might suggest that student-focused approaches to teaching might be positively correlated with successful development processes. Since student-focused approaches to teaching is associated with deeper approaches to learning (Trigwell et al. 1999), there might well be a correlation between employing a student-focused leadership approach and student learning.

In the literature on study program leadership/leadership of teaching and learning, it is important to note a related strand of literature that sometime overlaps with the literature on leadership for teaching and learning, i.e. the literature that emphasizes broader curriculum development processes. This literature is often associated with enhancement-led processes in which the academic content and the didactical design are closely interrelated in a more holistic way and where the role of leadership is toned down (Stephenson & Yorke, 1998). While the literature on curriculum development perhaps had reached its peak, and the number of contributions in this area reduced in the latter decade, one might also argue that curriculum studies in recent years have been transformed into concepts such as "constructive alignment" (Biggs & Tang 2011), which is more associated with learning outcomes and how to link program objectives closer to teaching and learning activities and student assessment.

In Norway, there are very few studies being conducted on leadership of teaching and learning in particular (but see Caspersen and Frølich 2014). In the evaluation of the implementation of the Quality Reform in Norway, it was found that the academic leadership had high awareness of the potential role of ICT in the delivering of educational provisions but that leaders with responsibility for teaching and learning often were conducting their job at a distance from the shop floor (Dysthe et al. 2006: 37), and

that the administration had taken a more dominant role in the running of the various study programs (Dysthe et al. 2006: 57). In an earlier study of how academic leaders follow up on external assessment it was found that effective leadership managed to translate these from merely accountability-driven processes to opportunities (Stensaker, 1997) – a finding which supports the claims made by Gibbs et al. (2009) about the importance of visionary capabilities in the leadership.

### **Accreditation and quality assurance**

While quality as a phenomenon has always been of interest to higher education institutions, formal evaluation and assessment is a more contemporary phenomenon, often linked to the shift towards more accountability in the 1980s with the spread of managerial ideas in higher education (Brennan and Shah 2000) and the spread of New Public Management ideals. Historically, there are different rationales for introducing quality assurance systems: in wealthy countries mass education systems increased the need for accountability, in poor countries there are increased concerns for minimum standards, and countries with traditionally high central control quality assurance mechanisms allow for more self-regulation and autonomy (Craft 1994). However, what more recent studies have shown is that while the rationales for introducing quality assurance systems might vary, the kinds of models and procedures that are introduced are nevertheless rather similar (Harvey and Williams 2010).

A broad distinction can be made between processes of accreditation and audits. Audit concentrates on the institution-wide systems that assure that the institution achieves the goals set and that it has a functioning internal quality improvement system. As such, the focus is not on the evaluation nor on the institution, but on the process in which institutions themselves assure academic standards and improve quality of teaching and learning, consequently being more flexible and cheaper (Dill 2000). Accreditation is a more structured discourse than audits, and the rationales are linked to (Stensaker and Harvey 2006): assurance of at least a minimum degree of quality (especially in highly deregulated and privatized higher education sectors); requirement of uniformity of study programs (e.g. in professional fields); and stimulation of increased student mobility. As such, focus on improvement of educational practices appears to be more decoupled from such processes, and there has been limited evidence of positive effects on teaching and learning (Houston 2010).

In Norway, focus on quality entered the public debate already in the late 1980s, with G. Hernes who posed the question on the level of ambitions in Norway when it comes to quality (Jordell et al. 1994). The Study Quality Commission (*Studie kvalitetsutvalget*) was the basis for an external quality review process in Norway. Research on the output of the institutional reports indicated that this process was viewed with caution by the institutions where a high level of competition between the institutions was identified (Jordell et al. 1994). Following the first quality assessment exercises, it was highlighted that it did not have a substantial effect on the relationships between departments, institutional leadership and the Ministry in terms of introducing more control, rather “the assessments appear to have given the traditionally autonomous and strong departments another ‘channel’ of influence from the bottom up” (Stensaker 1997). Studies examining the balance between internal and external quality assurance mechanisms indicated that the Norwegian approach was well adjusted to the national governance model at the time (Smeby and Stensaker 1999). However, in 2006, Stensaker and Harvey compared accreditation systems in six countries (including Norway), and point to the need to pay more attention to how accreditation is related to national policy-making and policy implementation, and to the legitimating function of accreditation beyond the “quality” dimension. The problem, as they outline it, is that while national systems are characterized by new challenges, the accreditation systems have not adapted sufficiently over time (Stensaker and Harvey 2006).

Overall, the debate on quality assurance has been rather slowly developing in the Norwegian context, with more focus on improvement rather than accountability measures (Lycke 2004). There is some evidence to suggest that the quality assurance system introduced in 2003 with the Quality Reform also had some impact on quality work. A study from 2004 indicated that institutions had plans for quality development and identified targets for quality improvement, with a broad range of activities designed to enhance teaching and learning, including also for instance focus on student active teaching

methods and work on the curriculum. The problem identified in the study was not so much the lack of focus on quality work, but the lack of routines for documenting such work (Askling et al. 2004). Institutional case studies suggest that the audits fell short of providing systematic data about how to improve student learning (Gynnild 2007).

The current system in Norway includes both accreditation and audits. The accreditation process in Norway gives the status of a self-accrediting institution, i.e. higher status. Audits are cyclical and the negative results are of more consequence than are accreditations. Hence, one can notice a blurring of the traditional ideas of purposes (accreditation = control/accountability, audit = improvement) (Danø and Stensaker 2007). As the system is now, a core difference between universities and university colleges is that universities are self-accrediting and can independently start up their own degree programs at all levels (Bachelor's, Master's, PhD). Accredited university colleges can independently authorize Bachelor's programs, for Master's and doctoral level courses they need additional accreditation. There are also some higher education institutions that do not have institutional accreditation. They are allowed to call themselves university colleges as long as they have some accredited study programs. However, they need to have all programs individually reviewed by the national body for quality assurance (NOKUT).

Quality agencies were established in many European countries in the 1990s. The agencies vary in status and ownership, scope of operation, focus of attention, composition and funding sources (Brennan and Shah 2000; Green 1994). In principle the establishment of such agencies is a change in the political coordination within the systems (Braun 2008), and represents the process of agencification. NOKUT was established in January 2003, with the Quality Reform. NOKUT has the main responsibility for issues related to both quality assurance (QA) of Norwegian education and recognition of foreign education. They are also a member of ENQA and other quality assurance associations/networks. In the year 2007/2008, NOKUT went through an evaluation to examine its operation and impact (Stensaker et al. 2010), where a nationwide survey was administered within the sector. While the results indicated that the various activities were perceived as control mechanisms, this was not negatively correlated with perceptions of positive impact. As such, despite the "slow start" described earlier (Lycke 2004), in a rather short period of time it appears that quality assurance had become a rather acceptable practice in Norwegian higher education. While audits and accreditations are often perceived as being linked to improvement and accountability respectively, the results from the NOKUT evaluation suggest that in Norway these distinctions are more blurred – the responses within the institution to both kinds of procedures were rather similar (Stensaker et al. 2010).

### **Funding conditions in Norwegian higher education**

Norway is a relatively small country and a society characterized by a high level of trust between various actors, thus the basis for funding from the Ministry is not based on formal contracts. A central characteristic is focus on egalitarianism and the welfare state, including also equal opportunities and strong belief in "free" higher education. In a worldwide context, this approach of neither tuition fees nor expectation of parental contributions differs from most other advanced industrial countries (Johnstone and Marcucci 2010).

Norway has a universal funding scheme for students, providing financial support independent of students' parents' economic situation (Opheim 2006, 2014). The State Educational Loan Fund (*Lånekassen*) has existed since 1947, with shifting grant and loan schemes over time. However, the general idea that *Lånekassen* should provide equal opportunities to everyone who wants to enroll in higher education, independent of socio-economic background and life situation, to incentivize students to complete their studies in time and to ensure a steady supply of highly-qualified employees, has always been the guideline (Opheim, 2006). *Lånekassen* is very widely used by students: 97 percent of students get support during at least part of their degree (Fekjær 2000).

The current grant and loan scheme have existed since 2002. The financial support is initially given as a loan, but depending on successful completion, students can get part of their loan converted to non-

repayable grants (*Lånekassen* 2015). To get the grant students also have to live away from home and cannot have earnings or assets above a set ceiling. Students who do not fulfill these requirements only get the student loan. Hence, the grant is progression-dependent, and was introduced as a part of the Quality Reform. One intention of this grant was to get students to complete faster, but there is little visible evidence of that (Opheim 2006).

The Quality Reform also introduced performance-based funding for institutions, and the new funding model replaced the previous system based on planned enrollments (Frølich & Strøm, 2008). Funding for public higher education institutions consists of a basic grant (60% of the allocation) and 2 performance-based components, with 25 percent of allocation based on educational output and 15 percent on research output. The indicators used to measure educational output are the number of completed credits, the number of graduates and the number of international exchange students, while the number of academic publications measures research output. One major difference between the two performance-based components is that research output has a ceiling, which in practice means that it can function as a redistribution of funds, while there is no limitation in earnings related to educational output (Frølich, 2006). Thus, to keep the level of performance-based funding steady, institutions have to publish on a par with other institutions, while increasing the average number of credits completed per student improves institutional funding (Frølich, 2006). There are so far no direct indications that the performance-based funding has led to reduced dropout rates or an increase in graduates, but students are on average completing more credits per year than they did prior to the reform (Aamodt & Hovdhaugen 2011).

### **Physical conditions for quality in Norwegian higher education**

Research focusing specifically on the physical conditions in Norwegian higher education is harder to come by. Studies from the US and UK show how architecture plays a role in creating a particular institutional saga and identity, where new institutions often emulated old architectural codes (Thelin 2011). In the Norwegian context, all higher education institutions are relatively new in a global scale, the architectural preferences have been more modest, and the construction of organizational identities through architecture has perhaps not been as visible. At the same time, this area does not appear to be thoroughly researched.

However, studies do indicate that the physical conditions form an important part of student satisfaction. A study by Wiers-Jenssen et al. (2002) examined the concept of student satisfaction and the role of physical environment (i.e. architecture both from a functional and aesthetic perspective), and found that it had a significant and independent impact on overall satisfaction levels. In the study, they provide three explanations for this significant impact: first impression of the institution, the impact of architecture on the social and learning aspects of student life, and that a more pleasing campus environment can stimulate students to spend more time on campus.

The system of conditions that must be developed to create robust educational practice varies also between subjects – and between academic levels. According to a new case study analysis of humanities education in Denmark (AKKR 2014) some disciplines are too small or weak with respect to creating an adequate research base, and the academic staff in these disciplines are increasingly burdened with teaching and administrative duties. The report proposed that a solution may be to cooperate across related subjects, usually across universities, both nationally and across the Nordic countries. It is argued that larger communities can drive more targeted work. Lower student numbers also contribute to small systematic quality improvements, including systematic evaluation practice.

A study by the OECD/IMHE (2009) examined the factors that contribute to high quality education in 29 European institutions of higher education. According to the report robust higher education results from the institution being focused on teaching quality where it is anchored in institutional policies (taking into account both external and internal constraints in their assessments), and the use of adequate technology with students actively participating in opportunities to evaluate studies. Hence, active institutional leadership can help create a culture around educational quality. The same report

concludes that number of students is not necessarily a challenge to the quality of education, if the institution/program has adequate funding, equipment and management commitment.

Architecture and physical environments also involve technological infrastructure serving both campus-based students and distance-based students. Learning management systems (LMS) are implemented at higher education institutions to serve staff and students with information and content such as curricula, learning resources and email accounts. Moreover, physical conditions that facilitate students to students' use of digital devices such as wireless internet connection, charging points for digital devices such as computers, ipads and cellphones will also influence students' learning when teaching and learning include various digital tools and devices. Studies in the Norwegian context reveal that both students and teaching staff consider the existing LMS solutions as inconvenient (Rambøll, 2010, Ørnes, et al. 2012; Tømte & Olsen 2013; Nordkvelle & Netteland 2014). Even if higher education institutions report having organizational units that develop, maintain and support the overall technological infrastructure (Ørnes et al. 2012), teachers report that existing equipment such as computers and monitors in some auditoria, seminar rooms and classrooms are too old and slow to use (Ørnes et al. 2012; Tømte & Olsen 2013). In such cases teachers give up organizing teaching based on the use of technology (ibid).

## **2.2 Key inputs and outputs of the Norwegian higher education system**

### **2.2.1 Recruitment patterns**

As in most other industrialized countries, the Norwegian higher education system has gone through the same enormous growth since the end of the Second World War (Askvik & Helland 2014, Trow 1973;2007). However, the growth did not begin until the late 1950s, which is somewhat later than in many comparable countries. From 1960, the system experienced a rapid growth, and the number of students grew from 10,000 in 1960 to 40,000 in 1975 (Aamodt 1995: 64). The initial growth was in the university sector, while from 1975 until 1987 most of the growth was in non-university institutions. As the Norwegian system has undergone merger processes, simultaneously as the number of institutions is shrinking, the number of students is increasing: from about 50,000 in the early 1970s to over 250,000 students today (Indikatorrapporten 2014: 99).

However, this growth in student numbers has not been distributed evenly across institutions and fields of study. The growth has been strong and consistent in some fields, while in others the number of students has declined, whereas in yet other fields the numbers have fluctuated (Askvik & Helland, 2014). Over time, there have been a tremendous growth in fields such as in business administration and health, whereas student numbers are declining in agriculture, and in some engineering subfields. There are also some differences in growth between institutions. Most institutions have grown over time, but the two largest universities, the University of Oslo and the University of Bergen have actually reduced the number of students in the last 10-15 years (Indikatorrapporten 2013: 91). The growth in number of students has also altered the gender balance in most of higher education. With the growth in student numbers, the number of female students grew faster than the number of male students, and passed the number of men during the 1980s (Askvik & Helland 2014).

Recruitment to higher education naturally has implications for quality of education, as programs that have more able students will face fewer challenges than programs that accept a greater range of students. This accounts for teaching, student progression and completion, and it may also have implications for the peer experience of students in higher education. Hence, it is established that recruitment and the level of prior knowledge the students hold is important for the type of quality that can be attributed to that specific program or degree.

### **2.2.2 Admission and selection**

Recruitment is not only related to the academic level of incoming students, but the way they enter the system may also have implications. Some countries have strict policies, only admitting students that have chosen a certain path in upper secondary education, while other countries have more liberal admission systems. Italy, Greece and many of the Central and Eastern European countries only have one entry route to higher education, while in many Western Europe higher education systems there are alternative routes to higher education. Both Norway and Sweden can be seen as having more liberal admission systems, and both countries provide alternative routes into higher education, other than holding an academic upper secondary education diploma (Orr & Hovdhaugen 2014). There is some evidence that higher education institutions in systems that are less vertically diversified, such as Sweden and Canada, are admitting non-traditional students in larger numbers (Bron and Agelli 2000; Schuetze 2000).

Another type of admission policy system comprises those with a strict hierarchy between institutions, where some institutions are selective and only grant admission to the most able, while other institutions apply “widening participation” and accept many, if not all, of their applicants. Hence, this hierarchy among institutions is common in the US and the UK, and differs quite a lot from the admission systems in the Nordic countries, that admit many though with some restrictions (see below).

Alternative routes to higher education may increase opportunities for more non-traditional students to enter higher education, but may also create a challenge to completion, as these students may not be as well prepared for higher education as those that completed upper secondary education directly preparing them for higher education. Analyses of students that entered higher education based on documented non-formal learning in Norway indicate that these students do less well in higher education than ordinary students, even when controlling for the fact that students entering based on non-formal learning come from less educated family backgrounds. In addition, many of them have family or work obligations (Helland, 2005). Hence, opening up admission to students who have not entered through the regular admission routes will, in some circumstances (e.g. no alternative adequate preparation/support of the students), have consequences for dropout and completion. This illustrates the tension between widening participation and completion.

Admission is in many cases based on grades, but in a system with little competition for study places, the student body accepted may be very diverse. This also differs a lot between programs, and may also differ between institutions. Prestigious programs or programs that have *numerus clausus* may have fierce competition for admission, and only the most able students are accepted. However, in many of the large three-year undergraduate programs in Norway, such as nursing, engineering, pre-school teaching, and a general Bachelor’s in humanities, social science and science, institutions have to accept a wide range of students in order to fill the study places. This diversity in the student body may have implications for quality, especially measured as completion rates. Hovdhaugen et al. (2013) showed that there is a clear relationship between grades and completion for Bachelor’s students in engineering, humanities, social science and science, while the relationship is less clear for nursing students and those studying to become a pre-school teacher. In these programs, many students manage to complete, even though they may have weak grades from previous levels of education. However, the study cannot indicate if this is because the requirements are different in different programs, if students’ motivations differ or if the institutions have differing strategies in different programs, and students in more successful programs get more support and possibly better teaching than students in less successful programs.

### **2.2.3 Completion and drop-out**

Completion rates and dropout rates are commonly used as parameters to measure quality in higher education. However, a challenge in this approach is that the question is “what is a good completion rate or retention rate”, or a “low enough dropout rate”. We cannot expect that all students starting a program have completion of a degree, or specifically that degree as their main goal. Hence, we cannot

assume that all students will complete. But depending on how completion and dropout is measured, different pictures will be painted. Thomas and Hovdhaugen (2014) point this out in an article on the challenges to comparing completion rates. When looking at the OECD survival rate in higher education, Norway, along with Sweden and Poland comes out as a country where fewer students complete, while completion rates are high and dropout rates are low in Denmark and the UK. However, when compared with an analysis of dropout rates based on PIAAC data done by Schnepf (2014), Norway, comes across as a country that has a low dropout rate and high rate of lifelong learning. This is also true for Sweden and Poland.

However, compared with many other countries Norwegian students graduate relatively late, and in some programs in low numbers (Næss 2003, Hovdhaugen et al. 2013). But most students that do not complete the program they started do not drop out, but transfer to another program and/or institution (Hovdhaugen 2009). This is not a unique pattern for Norway, but is also common in Sweden; in Denmark is it as common to postpone HE start or to take a year off education while taking a degree as it is in Norway. This is an effect partly of the higher education system as such. Credit transfers are widely accepted in several of the Scandinavian countries, which imply that students can start one degree and then switch to another, and still be able to use all or at least some of the credits they have already acquired in their new program. This means that students who find out that they were not that interested in the program they first started, or who change their mind, get the opportunity to choose again, without the costs of reorientation being too high (Thomas & Hovdhaugen 2014, Hovdhaugen 2012). By contrast, in the UK, credit transfer is not widely accepted, and therefore students who leave higher education might state "incorrect choice of program" as the reason (Yorke and Longden, 2004). "Incorrect choice of program" is a rarely used explanation for Norwegian students that leave higher education (Hovdhaugen and Aamodt, 2009). Flexibility, which allows students to move easily between programs and institutions, may also have a downside as it might cause study delays and will increase the time spent in higher education to complete the degree. In Norway, Sweden and Denmark students usually spend quite a long time to complete a degree, and this is partly due to the opportunity to change courses along the way (see for example Hovdhaugen, 2012). This implies that while flexibility might be a remedy against dropout by reorienting students to another program, it may also contribute to increasing time spent to get a degree, which can be regarded as an inefficiency. If quality in higher education is defined in terms of efficiency, then this would contribute to a view of lower quality.

As mentioned earlier may it be hard to state if low completion rate within time to degree is related to low quality of education or not. There are also great differences in completion rates across fields of study. Hovdhaugen and Aamodt (2006) show that there were quite large differences in first-year retention rate between undergraduate students at universities and in university colleges, and similar patterns have also been found for specific programs at universities and university colleges respectively (Aamodt & Hovdhaugen 2011, Hovdhaugen et al. 2013). Nursing has relatively good completion rates at estimated time to degree, and over 80 percent of students starting in a given year complete the degree. Students in undergraduate programs in humanities and social science at universities on the other hand have a low level of completion on estimated time, only one in five students, and after 6 years, double the estimated time to degree, about 60 percent have completed a degree. However, the completion rate is on a par with other countries that have similar higher education systems, (Universitetskanslerämbetet 2013).

Analyses of student patterns indicate that Norwegian students have a disorderly study pattern, moving in and out of the system and in and out of degrees (Aamodt 2001). The specific pattern of student departure observed is partly shaped by the system of higher education itself. Norwegian higher education can be described as a liberal system with mutual recognition of courses. In such a system, student mobility becomes normal, even encouraged, and transfer from a university to a university college may be regarded as a horizontal rather than a downward move. This aspect is strengthened by the prestige of a university degree being only moderately higher than that of a university college degree (Hovdhaugen 2009).

Analyses of why students leave their institution before degree completion indicate that student departure in Norway represents a rather complex pattern of mobility between institutions. The main finding in Hovdhaugen (2009) is that both dropout and transfer, as two types of student departure, are related to two almost opposite sets of underlying factors. Background characteristics, such as parents' educational level and previous school achievement, have an effect on the probability of dropping out of higher education, but have no effect on transfer. Correspondingly, variables on motives and choice have no significant effect on dropout, but are important for understanding transfer.

#### **2.2.4 Internationalization**

Internationalization has been high on the agenda for policy on higher education in many countries the last decades. Many initiatives originate from EU higher education policy (such as the Bologna process, the Lisbon convention and the ERASMUS program) and spread to other countries.

Internationalization may be seen as a response to globalization (van der Wende 1997), a process that is more politically driven compared with an economically driven globalization process. Knight (2007) notes that internationalization refers to a series of international activities, such as academic mobility for students and teachers; international linkages, partnerships and projects; new, internationally oriented academic programs and research initiatives. Further, it can also refer to delivery of education in other countries, through this is so far not particularly relevant in the case of Norway. Moreover, the concept refers to integration of an international, intercultural and/or global dimension in the curriculum and teaching/learning process, as well as internationalization through development projects. Hence, the term "internationalization" can be linked to a range of different activities that potentially can contribute to the quality of higher education.

The rationales for internationalization of higher education are often divided into four main categories: academic, economic, social/cultural and political (see e.g. Blumenthal et al. 1996, van der Wende 1997, de Wit 2002, Knight 2004). Academic rationales are closely related to quality, in particular quality understood as excellence. The idea is that students and faculty members should learn from, and exchange ideas with, prominent researchers and higher education institutions across national borders.

All four rationales mentioned above are found in Norwegian policy on internationalization. In the 21st century, a development towards a stronger emphasis on quality and relevance is observed. In other words: an accentuation of academic and economic rationales. In the most recent white paper on internationalization, policy on internationalization is closely linked to knowledge policy, and internationalization and student mobility is seen as means to enhance quality and relevance of Norwegian higher education institutions (White paper no. 14, 2008 – 2009). An aim of stronger integration of research cooperation and cooperation in higher education is also expressed in this document. It is assumed that internationalization will strengthen global competitiveness, and that mobility will enhance quality in Norwegian higher education institutions.

The concept of *internationalization at home* is used to describe the goal whereby students who are not internationally mobile should be exposed to international impulses. Internationalization at home can be international curricula, but also provides a learning environment consisting of faculty members and/or students from other countries. This concept is adopted in Norwegian policy lingo, and incoming mobility is seen as an important means to make internationalization at home a reality.

While Norway traditionally has had far more outgoing than incoming students, the figures are now almost balanced. The number of foreign citizens studying in Norway has almost tripled since the turn of the millennium (Wiers-Jenssen 2015). The reasons for this are complex, but policies for facilitating incoming, including setting up more English taught programs, are important (Vabø and Wiers-Jenssen 2015). The fact that higher education is still free in Norwegian higher education institutions is also important. While neighbouring countries like Sweden and Denmark have introduced tuition fees for non-EU citizens, public higher education in Norway is free of charge for all.

Internationalization is no longer seen just an end in itself, but a means to achieve other goals, of which is quality enhancement a central one (Frølich et al. 2015). This is a trend observed in many countries. However, it is less clear how internationalization and student mobility is supposed to enhance quality in practice – the relation seem to be taken very much for granted in policy documents and institutional strategies. The relation between internationalization and quality definitely needs to be questioned. Jane Knight is among the scholars who are skeptical about this relation. She argues that it is a myth that foreign students on campus will produce a more internationalized institutional culture and curriculum (Knight 2011). There are also a number of other articles taking a critical look at challenges and barriers to international mobility of students (see for example Alfaro 2009; Döring et al. 2010; Pietro 2008; Raikou 2007). Further, many studies have shown that interaction between international and national students is limited (Arkoudis et al. 2013). This is also the case in Norway; many international students rarely or never interact with Norwegian students (Wiers-Jenssen 2015). If international students are poorly integrated in higher education, neither quality enhancement nor internationalization at home can take place. And even if there is a substantial amount of interaction, this does not necessarily imply quality enhancement. One of the barriers is language. For example, it is not obvious that teaching in English by non-native speakers, to students with a different command of English, provides optimal learning outcomes. Moreover, not all institutions reflect on what kind of international students they recruit. Norway has few well-known and highly-ranked higher education institutions, and it is not necessarily the most talented international students who choose Norway as a study destination.

In 2013, a survey was conducted with academic staff in Norwegian universities and university colleges (Kyvik & Wiers-Jenssen 2014). One of the topics covered was the use of English language in teaching and supervision activities. Vabø and Wiers-Jenssen (2014) examined the variation of using English and other foreign languages in teaching and tutoring. In their study, the majority of staff (61%) reported that there were existing exchange programmes of high standard. Furthermore, the majority of staff agreed that students obtained positive effects on their academic outcomes from having studied abroad for a period of time. The study found disciplinary differences in respect, as it was health sciences and humanities who reported most positive views on outcomes enhancement whereas technical fields were more negative. The study by Vabø and Wiers-Jenssen (2014) also showed that the staff held no widespread views on this having a positive effect on learning outcomes locally, claiming that this can be seen as indicative of study exchanges primarily having an individual gain for the students. Furthermore, while staff was positive about incoming international students, one in three reported that they found it challenging to facilitate teaching for such students, and both English language teaching and cultural differences were mentioned as being difficult. Disciplinary differences emerged amongst staff views, as almost half of staff in the fields of agriculture, fisheries, and veterinary subjects found this challenging. There are widespread beliefs regarding the positive effects of “internationalization at home”, however, this study also highlighted that there is relatively little systematic knowledge on how this affects quality (Vabø & Wiers-Jenssen 2014). In particular, Vabø and Wiers-Jenssen (2014) note that: “To the extent that internationalization in higher education produces higher quality in terms of additional resources, broader thematic orientation, richer study environments, broader international networks and experience, it also means that the quality reinforcing effects of internationalization are unevenly distributed among students”.

### **2.2.5 Employability and relevance**

Traditionally, the concept of employability focused on getting a job after graduation (Aamodt & Havnes 2008, Hillage & Pollard 1998). However, this is not necessarily a valid indicator of the education, since it is strongly affected by labor market conditions and the demand for educated manpower, and may be only loosely linked to the quality of education. A widened understanding of employability indicates a shift from analysing transition patterns towards the understanding the relationship between curriculum and job content.

Post-industrial employment is understood as having a need for graduates from higher education with solid general skills in addition to their special qualifications. Examples of general skills needed are a

flexible and innovative manner, good interpersonal skills, and an ability to take part in global operations and to master information and communication technology (Teichler & Kehm 1995;; Teichler 1999; Alesi et al. 2005; Høstaker & Vabø 2008). This implies that higher education also is expected to serve certain needs of students, needs that are not necessarily covered within traditional classroom-based teaching and learning, such as international experience organized through stays abroad for students. This is also visible through the fact that larger Norwegian companies value candidates who have lived or studied outside their home country (Vabø & Nerdrum 2006). In addition, graduates will need to tackle new challenges quickly, be flexible, open and have the ability to learn new things (Brandt 2003, 2005, Brandt et al 2008).

The extensive growth in higher education has led in many countries to a substantial growth in study programs with an applied and vocational profile (Henkel 2000; Becher & Parry 2005). While external stakeholders (students and their families, student organizations, employers, workers and their organizations, etc.) traditionally have had an implied position in Norwegian higher education, their interests and power have become more explicit. We see larger businesses, trade unions and various government ministries prioritizing time and resources on higher education and skills policy both directly, through representation on the governing bodies of the institutions, and more indirectly, through greater emphasis on external evaluations and student evaluations as a management instrument. Stakeholder increasing power, and hence the interests of students as consumers, leads in many countries to a significant growth in study programs with applied profile (Norway) (Teichler 1999; Henkel 2000; Becher & Parry 2005; Michelsen & Aamodt 2006a, 2006b).

Surveys conducted in Norway and other European countries show that many graduates from higher education experience that the content of their higher education is useful for tasks in the workplace. In a survey conducted in 1999 among workers from France, England, Finland, Netherlands, Norway, Germany, Japan, the Czech Republic and Austria, educated in 1994-1995, only 12 percent experienced disparity between work and education. Only seven percent felt that education was redundant in relation to work (Paul et al 2000, Teichler 2000, Teichler & Schomburg, 2001).

Støren and Aamodt (2010) in a study based on the REFLEX-survey conducted in 13 countries, (Allen & van der Velden (eds.) 2007), used a statement about the study program being a good basis for starting work as an indicator of labor market relevance. They found a positive effect of specific characteristics of the program such as “employers being familiar with the content of the program”, “the program is demanding”, “prestigious education”, “problem-based learning”, “practical knowledge” and “internships”, while “multiple-choice examination” had a negative effect. The analysis took into consideration country differences, labor market situation, and the distinction between general or professional programs.

Emphasis on external relevance of higher education is reflected in institutional quality assurance systems and accreditation processes (Stensaker & Harvey 2006). In the higher education policies implemented in the European and EU context, terms such as “employability” and “learning outcomes” have a central place. Norway reflects this *inter alia*, as the question of the social relevance/vocational relevance of studies is incorporated in the guidelines for institutional quality assurance systems (prepared by NOKUT).

A German comparative study of changes in the relationship between higher education and employment in the wake of the Bologna process, found that universities took this opportunity to change existing content. The reforms have led to an increasing share of innovative and interdisciplinary study programs, and greater breadth of Master’s studies, in all countries studied: Germany, France, Netherlands, Norway, Hungary and Austria (Alesi et al. 2005).

Norway has in recent years not had significant unemployment among graduates. It is expected that value creation in the future will increasingly rely on products based on research-based knowledge and innovation (Nowotny et al. 2000). The need for highly skilled labor is therefore increasing, partly also because of the changes in industry structure.

As was also the case in other countries such as France, the Netherlands, Hungary, Austria and Germany, the Bologna process represented a historical opportunity for universities to introduce new curricula and pedagogical methods to develop and establish many new study programs, often interdisciplinary and innovative both at the Bachelor's and Master's levels (Alesi *et al.* 2005; Vabø 2007; Vabø and Aamodt 2008). In Norway, the interdisciplinary or innovative content of such new programs is illustrated by, for example, cultural studies, innovation/entrepreneurialism, health studies, education/learning, management studies, Information and communication technology (ICT), new technology, ecological concerns, development studies, area studies (for example, African studies) and programs focusing on the concerns of particular social groups such as feminism and labor history. In Germany, similarly innovative combinations of fields of knowledge have been forged into new study programs. Examples are: biodiversity, global political economy, educational administration and management, or economic law.

Furthermore, many of the new programs were typically perceived as central to the needs of the expanding knowledge society in which there is closer collaboration between higher education and industry. Moreover, the new study programs frequently have an international focus in terms of content, dealing with, for instance, global issues such as maritime law, gender and development, or peace and conflict studies. Some are taught in English and/or designed in co-operation with foreign higher education institutions involving the exchange of both staff and students (Schwach 2009). The new module-based study programs obviously serve as a flexible tool for the universities making it easier to respond to certain demands by connecting subjects from different academic disciplines into interdisciplinary study programs. The new degree structure seems to represent a better functional differentiation between professionally and academically oriented programs at both the Bachelor's and Master's level. As a result, the educational landscape has changed considerably in just a few years and became more diversified.

The present debate questioning whether the new Bachelor's degrees at the free faculties are relevant for the needs of the labor market are illustrative for a tense relationship between *Bildung* and professional training continuing also within the new two-cycle degree structure. According to a recent survey among undergraduate students, only 15 percent aspire for a Bachelor's degree only, while the large majority aspires for Master's and PhD studies (Arnesen & Waagene 2009).

### **2.2.6 Student satisfaction**

Student satisfaction is a concept that can be said to fall under the broader theme of student evaluation of teaching (Spooren *et al.* 2013), although it is also regarded as a key output factor with respect to quality (Wiers-Jenssen *et al.* 2002). It is the latter understanding that is addressed in this section (see chapter 3 on feedback and assessment for a discussion related to the former understanding). Although the relationship between the concept of student satisfaction and student evaluation of teaching is unclear, it can be argued that student satisfaction is broader in its focus, incorporating elements such as social climate, physical infrastructure, and leisure activities (Wiers-Jenssen *et al.* 2002: 186-187). Student satisfaction has over time attracted considerable attention due to its anticipated relation to issues such as academic quality, student retention, branding, loyalty, and course design. In other words, student satisfaction is a complex concept that is a result of a variety of factors (Wiers-Jenssen *et al.* 2002; Appleton-Knapp & Krentler 2006; Helgesen & Nettet 2007).

Focus on student satisfaction as a variable has also caused considerable criticism in that it is suggested that satisfaction brings along an understanding of higher education as a service to be consumed (Gruber *et al.* 2010), and that it may take focus away from student learning to specific attributes of the educational provision. Some very famous experimental studies have demonstrated the potential validity of this concern when an actor pretending to be a lecturer achieved quite high student scores on his performance when using humor, movement and enthusiasm, and achieved lower student scores when lecturing in a less expressive mode (Williams & Ware 1977). This effect, often labeled as the "Dr. Fox effect" has triggered an ongoing critique of the validity of student evaluation of teaching ever since.

Still, there is a considerable amount of research that has been conducted on issues related to student satisfaction over the last decades. In line with the original studies by Williams & Ware (1977), later research has also found that instructor teaching style is an important predictor of student satisfaction (Dana et al. 2001), although the preparation of the teacher and the clarity and the intelligibility of the teaching conducted is an equally strong predictor of satisfaction (Feldman 2007). Other factors that are positively correlated include the quality and speed of feedback from teachers to students, class size, the quality and quantity of interaction between students and teachers and among the student group, student perceptions of the fairness of the instructor as well as personal characteristics of the student, such as previous grades (Appleton-Knapp & Krentler 2006). In addition, disciplinary differences can be found with respect to student satisfaction (Wiers-Jenssen et al. 2002, see also Wiers-Jenssen 2014). Furthermore, studies also indicate that gender characteristics in a study program matter as an increasing proportion of female students increase satisfaction with their academic specialization and with personal skills development (Umbach & Porter 2002).

The research profile of the faculty seems to play a role as student satisfaction increases with the proportion of external research grants attracted by the academic staff. Apart from underlining the link between research and education, this may indicate a halo effect related to the perceived prestige of institutions, departments and scholars that are able to attract external funding (Umbach & Porter 2002). At the same time, other studies have found that the link between teaching and research is weak (Marsh 2007: 346). However, student satisfaction may not only be related to the teaching experience and perceptions about the academic content and delivery of a program. For example, studies also show the relative importance of physical infrastructure such as lecture halls and buildings and aesthetics (Wiers-Jenssen et al. 2002; Gruber et al. 2010; Helgesen & Nettet 2007).

Several studies have also examined the relationship between individual characteristics of the student and student satisfaction suggesting that motivation, expectations and self-efficacy are influential factors conditioning satisfaction and possible retention (Appleton-Knapp & Krentler 2006).

The multi-dimensionality of concepts such as student satisfaction and student evaluation of teaching in general have triggered a heated methodological debate that can be seen as a continuation of the controversy caused by the Dr. Fox experiments in the 1970s. Not least is the suggestion that problems may be related to how data are collected and how questionnaires are designed (Elliot & Shin 2002). In an overview of the literature on student evaluation of teaching, Marsh (2007) expressed disappointment about the lack of large-scale, systematic and comparative studies in this area. On a more personal note, he also argued that in practice, it seems that the use of information obtained from students on the teaching and the educational provision in general is more linked to personnel decisions rather than for improving teaching effectiveness (Marsh 2007: 373). This is also perhaps the key factor explaining why student feedback on teaching and educational offerings in general is met with considerably skepticism from the academic community (Spooren et al. 2013: 626).

In a recent comprehensive review of student evaluation of teaching instruments it was argued that although some instruments do have high content-related validity, a number of instruments in use have never been tested for their construct validity (Spooren et al. 2013: 626-627). Hence, there is consequently no consensus whether there is a strong relationship between student evaluation of teaching and student achievement (Spooren et al. 2013: 627).

In general, these caveats apply also to the Norwegian setting. Although some comprehensive studies on student satisfaction and student evaluation of the educational provision more broadly have been conducted (Wiers-Jenssen et al. 2002, Otnes et al. 2011), there is a lack of studies that are comparative and longitudinal, although some attempts have been made in the past (Wiers-Jenssen 2014). In a summary of the key insights of how students view the quality of the educational provision in Norwegian higher education, Wiers-Jenssen (2014: 320) have pointed out that most students seem to be satisfied with their education after graduation, and that few are dissatisfied. Consistently, it seems that students are more satisfied with the academic quality than its delivery in terms of didactics. There are relatively large proportions of students that are dissatisfied with how teachers follow students up,

and with teacher feedback (Wiers-Jenssen 2014: 325). However, some factors that are found to influence student satisfaction in international studies also seem to be influential in the Norwegian context; including size, disciplinary differences, and individual characteristics of the students. This might suggest that the Norwegian empirical setting is not that different, and that we need more studies on conditions affecting the delivery of the educational content.

### **2.2.7 Academic staff's views**

In the international comparative study Changing Academic Profession (CAP) (Vabø & Ramberg 2009; Bentley et al. 2010), academic staff at universities were asked a number of questions that reflect some of the main themes that have been covered in this chapter.

One of the questions that was asked in the CAP study was the following: "With regard to your own preferences, are your interests primarily in teaching or research?" Overall, 68 percent of the respondents in the other six countries – Australia, Finland, Canada, Germany the US, and the UK – reported greater interest in research than teaching. For Norwegian university researchers this proportion was 81 percent. When correlating these results with available time commitment to research and teaching, we found that the Norwegian university staff reported both greater interest in research and also in more time to teaching than their foreign colleagues. These differences between Norway and the other countries are likely to be due to the Norwegian norm of approximately equal time for teaching and research for all positions. Preferences for teaching and the variety of teaching modes are important as regards time reserved for teaching activities (see also Teichler & Höhle 2013).

Another feature of Norwegian university staff is that they are more skeptical than their foreign colleagues regarding strengthening the relevance of studies with respect to practice and the world of work. Furthermore, the study also revealed that satisfaction with classrooms and auditoriums varies between countries. Finland has the highest percentage academic staff that are satisfied (78%). Norway has 56 percent – about the average for all countries (52%). Academic staff in the UK are the least satisfied in this regard, with a share of 35 percent reporting satisfaction with classrooms and auditoriums at their institution. In the Norwegian sample, those working in the field of technology have a lower proportion that are satisfied with classrooms and auditoriums.

Regarding technological equipment for teaching, again, Finland had the highest percentage that were satisfied (75%). Among the academic staff in Norway, 59 percent responded that they are satisfied with the workplace technological equipment for teaching. This is more or less equal to the average for all countries. Also in the assessment of technological equipment for teaching, staff in the UK were least satisfied (41%).

In respect of access to teaching assistants, academic staff in Norway were particularly negative, with only 18 percent reporting that they are satisfied. This is well below the average of 30 percent. Academic staff in Finland were again those most satisfied (41%). Norwegian university researchers are also the most decidedly unhappy with the possibility of teaching assistance; 60 percent gave the two worst response options, against about 40 percent on average for all.

# 3 Teaching, learning and assessment

## 3.1 Introduction

A critical question for program quality is how, and to what extent, educational practices enhance student learning. In this regard processes of teaching, learning, assessment and course design are interrelated. Research has shown that teachers' approaches to teaching are related to the way students engage in learning activities (Trigwell et al. 1999; Baeten et al. 2010) and that the internal coherence in a course between learning activities, anticipated outcomes and assessment forms matter for the quality of student learning (Biggs & Tang 2011; Hattie 2015). Hence, it is not feasible to address teaching and learning as isolated processes. Moreover, the role of teaching in student learning has changed in many ways during the last decades. From a situation where lectures and teacher-led activities served as significant access points to information and knowledge, the learning challenge of today is not about access to information but rather about making sense of increasingly specialized knowledge from a multitude of sources. It is therefore widely acknowledged that learning is related to performativity and to the active construction of knowledge (Säljö 2010).

These developments have led to an increased emphasis on student-centered learning activities and the use of technology to change the traditional roles of students and teachers. At the same time, such activities may be challenging for students and in some cases contribute to increased differences in achievement (Gil et al. 2010). Questions of quality in teaching and learning processes are thus related to how student engagement and opportunities for learning are supported through specific instructional approaches, but also to how feedback and assessment provide supportive learning situations for students.

Acknowledging these points, we have structured this part of the review around three main themes: Pedagogical approaches, Feedback and assessment, and Technology-enhanced learning environments. First, in section 3.2, we place emphasis on *pedagogical approaches* aimed at fostering students' engagement and supporting their construction of knowledge. We have been concerned to include approaches and activities that are frequently used in higher education, and to include different student-centered approaches that increasingly gain foothold. We commence by reviewing research on such long-established activities as lecturing in large groups, seminars and group-based discussions of literature. Next, we focus on more recent approaches aiming at engaging students in inquiry and knowledge construction. This part addresses Problem-based learning, Case-based learning, Project-based learning and Inquiry-based learning, as different student-centered approaches that can be placed on a continuum from exploring established knowledge to producing student research or products. The following section 3.3 focuses specifically on *feedback and assessment*, with the intention to summarize existing research and identify what is considered as supportive for student learning. Approaches to feedback and assessment may take distinct forms in different pedagogical

activities; however they also work across the pedagogical formats discussed above. For this reason, we found it feasible to address this theme separately. For similar reasons, section 3.4 focuses explicitly on different forms of *technology-rich learning environments*, and what we can learn about program quality from research on teaching and learning in such environments.

Each of these sections starts with an overview of international research, followed by studies and insights generated in the Norwegian context. In section 3.5 we focus on a common denominator for the quality of teaching and learning processes across the various approaches, namely the importance of relating teaching and learning practices to the character of the disciplinary or professional culture they are to serve. Section 3.6 ends the chapter by bringing together key aspects that matter for the quality of educational practices and by highlighting the need for aligning the various elements of teaching and course design to support productive learning.

## 3.2 Pedagogical approaches

### 3.2.1 Lecturing

Lecturing is a traditional instructional method which remains predominant in higher education despite critique of its insufficiencies (Young et al. 2009). The critique against lecturing concerns everything from inefficiency regarding student recollection (Smith & Cardaciotto 2011), to challenges in keeping students' attention (Young et al. 2009), to unpopularity amongst students (Pettersen 2005), to failing to achieve deep learning and not gaining influence on attitudes and behavioral performances (Mulryan-Kane 2010). Upsides of lecturing are the opportunity to control content and efficiency in reaching large groups at a relatively low cost (Race 2007). Studies of teacher attitudes also indicate that teachers with a content focus, focus on transmitting detailed information prefer lecturing, while teachers emphasizing critical thinking and reflection are more comfortable using different and more active teaching methods (Beekes 2006).

A main critique of lecturing to large classes is the passive nature this instructional method entails. A main hindrance is low student attention as well as a tendency of reinforcing surface approaches to learning (Williams et al. 2012). Experiments on student concentration document that short breaks with novel activities are a possible solution in order to reestablish student attention (Bligh 2000), while attaining variation during lecture-presentations helps students in keeping attention (Huxham 2005). Interactive sessions of variation enable both motivational effects as well as encouraging deep learning (Lammers & Murphy 2002). Other measures in securing student attention are reduced lecture time, such as mini-lectures, as well as using additional sources of information such as video demonstration and pictorial illustrations (Mayer 2011). In principle, using content-relevant measures to break up the monotony of the lecture is considered as a valuable method of breaking up and intersecting too-long information flow during lectures (Morton 2009). The posing of questions from lecturer to listening audience is emphasized here as beneficial in both keeping attention and influencing student knowledge processing (Mayer 2011). Also the use of digital resources such as student response systems is emphasized in the literature as a fruitful resource in achieving student engagement during lectures (Kay & LeSage 2009; Strømsø 2014). These tools are also implemented in a variety of ways in Norwegian higher education such as practical experiments in physics education<sup>2</sup> and medical education<sup>3</sup> as specific examples as well as more generally oriented studies and documentation of university lecturing as such (Krumsvik & Ludvigsen 2012).

To sum up, combinations of various active elements within lecturing are suggested, such as digital sources, cases, illustrations, interactive components, questions etc. and thereby breaking up the danger of monotony and passiveness within this format (McKeachie 2007). The literature also suggests a broader definition of active learning where student engagement and lecturing are not

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<sup>2</sup> <http://universitas.no/nyhet/60126/far-halv-million-for-fremragende-forelesninger>

<sup>3</sup> <http://www.uio.no/studier/om/kvalitet/undervisning/eksempler/klikkere-medisin.html>

considered as mutually exclusive, but perceived more in an exploring manner of integrative features combining information with engaging learning task (Fry et al. 2009). The backdrop to these active notions in lecturing are according to some critiques, reduced accuracy of content and lower control over lecturing time (Morton 2009).

### **3.2.2 Seminars and organized discussions**

Seminar teaching is also a long-standing teaching format in higher education, which in contrast to lecturing emphasizes peer interaction. Seminar teaching dates back several hundred years, with the original intention to let students present their own interpretation of literature or written texts, defend and argue their positions, while also allowing other students to challenge and dispute student presentations (Nordkvelle 2003). Seminars were considered as a demanding format, requiring a large amount of preparation and insight from both presenters and discussants, as well as depriving the teachers of full control of the content and development of the instructional flow (Pettersen 2005). Seminars in higher education today tend to represent an addition to the listening, reading and noting in lectures and solitary studying (Lopez & Gallifa 2008). With a focus on peer based interaction, seminars often hold a focus on making students express, articulate and dispute, thereby forwarding oral performance and participating in a learning community (Evans 2013). A challenge with the seminar as an instructional label is that it signifies a wide range of different practical approaches stretching from almost pure lecturing to very interactive and student-driven settings (Nordkvelle 2003).

Instruction based on peer learning and interaction, such as seminars, emphasizes the dyadic relation of sharing, exploring and elaborating on knowledge (Wenzel & Watkins 2011; Salvin 2011). While specific research on seminar teaching is scarce, research on peer interaction and learning refers to several positive consequences such as the active construction of meaning through expression and the possibility for students to expand their knowledge by exchanging insights and interpretations. Studies also document positive aspects related to student motivation, deeper factual and conceptual understanding, and developing competencies in working together (Aditomo et al. 2013; Salvin 2011; Wenzel & Watkins 2011). Challenges for succeeding with this format are related to the establishing of positive interdependence in groups offering adequate teacher support (Fry et al. 2009; Papinczak 2010; Schmidt et al. 2011), and providing suitable settings for face-to-face interactions (Wenzel & Watkins 2011).

A less formal type of interaction-based learning activity, are *literature study groups* (also known as *literature study*, *lit sets*, or *student colloquium*). Literature study groups are a frequent approach when the goal is to create a context for discussion, debate or understanding/constructing meaning about new concepts and ideas from (disciplinary or scientific) literature. Literature study groups are also used in an adapted format in courses in higher education, where instead of discussing literature of their choice, students engage in discussion of the literature from their compulsory course readings. The underlying rationale (originating in transactional theories of literature) is that students bring and/or construct their interpretations to the group, and construct deeper meaning through the exposure of their ideas to critical analysis from peers. In institutionalized settings, such activities can be instructor-organized and led (the instructor acting as a facilitator/participant with small groups of students), but also self-organized. Empirical studies and evidence on the effectiveness of such types of learning activities in higher education are rather scarce. Results from a survey among teacher students participating for the first time in literature study groups (Roberts & Hadjiyianni 1997) indicated that students valued these groups because they offered the opportunity to gain a variety of perspectives. In a more recent study of graduate teacher students learning to work with literature sources individually and through group discussions, Shaw (2011) focused on opinions of students involved in the process to discover effects on their knowledge and teaching of comprehension. The findings show a very positive attitude of students towards this form of activity, which was favored clearly by the students participating in the course; and that there was a high degree of engagement by students and self-regulation. The groups' activities and strategies were, however, highly regulated by the teacher, who decided the group size, discussion time, roles of members, suggested peer scaffolding and provided examples of on-task behavior. In a study of an intensive primary-literature based teaching program for

science majors, Kozeracki et al. (2006) assessed students' views of the organization, quality and outcomes of the training program, with a focus on components of presentation and critical analysis of scientific articles and own research. These results too, indicate a rather structured approach to reading and discussing the literature, with the content, strategies and feedback strategies on discussion participation and presentation under the responsibility of the teacher and a lesser degree of input from peer students. Mayo (2002) analyzed the use of dialogue in an undergraduate colloquium in psychology, in which students discussed statements from the field literature in groups. The study highlighted the value of peer interaction and dialog with regard to the potential offered for teachers to move the emphasis of teaching towards built-in questions and personally-derived explanations by the students. With regard to the efficiency of the method, the findings indicated that the best discussions (as reported by the students) were those where the teacher was a participant and allowed students to test out new ideas, explanation and peer feedback.

From the reviewed studies, a trend emerges that suggests that literature study groups are valued by the students, but that they function more efficiently and support students in achieving the envisioned goals when organized and guided by the instructor.

Finally, a study of Dutch undergraduate students learning through seminars (Spruijt et al. 2012) also indicated the major role of the instructor's leadership skills in leading the seminar, preparation, course schedule and alignment for the educational effectiveness of seminars. One major finding concerned the suggestion by students that seminars would be more efficient if the instructor can stimulate interaction and active participation in bigger seminar groups by splitting these in smaller groups and using facilitating methods that allow time for thinking, buzz groups and plenary discussion.

### **3.2.3 Student-centered approaches**

More recent pedagogical approaches hold an interest in learning activities that more strongly require students to be active participants in practices of sharing, understanding and constructing new knowledge. The term *student-centered* is often contrasted with *instructor/teacher-centered*, the latter emphasizing knowledge transmission associated with listening (Wright 2011). Student-centered approaches therefore seek to involve students actively with disciplinary issues in the academic or professional field (Barkley 2010; Baeten et al. 2014; McCormick et al. 2013). As such, these approaches are also related to various ways in which research-based education can be realized (Healey & Jenkins 2009; Toom et al. 2010).

The empirical studies examining the approaches to student-centered learning in higher education has followed a few lines of research. We will now look into key findings from this research, categorized along the pedagogical approaches of problem-based learning (PBL), case-based learning (CBL), project-based learning (PjBL), and inquiry-based learning (IBL).

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

Problem-based learning is an instructional, learner-centered approach in which students learn by integrating theory and practice, and applying knowledge and skills to generate a solution to a problem (Hmelo-Silver 2004; Savery 2006). This instructional approach has been elaborated within medical education and emphasizes self-directed experiential learning around the investigation and resolution of ill-structured, authentic problems (Hmelo-Silver 2004; Savery 2006). These problems represent a trigger for inquiry in organized group work, with student groups working together on a weekly basis. Most commonly, PBL is based on a seven-step procedure ensuring that the students learn in a step-wise manner to identify and define clinical problems and thereby learn to identify relevant information, suggest hypotheses and based on their own reasoning reveal knowledge gaps, define learning goals and elaborate solutions (Savery 2006). The method entails both group and individual work, where each learner is responsible for contributing actively in exploring a presented case description.

The most recent studies on problem-based learning have been conducted within medical education, many focusing on the efficiency of the method in comparison with traditional instruction (Hung et al.

2008; Strobel & van Barneveld 2009), and the mechanisms of the problem-solving process (Hmelo-Silver 2004; Hmelo-Silver & Barrows 2008). Findings show that this method both triggers and sustains collaborative construction of knowledge, that students engage by reacting to and modifying each other's ideas to increase understanding of the problem (Hmelo-Silver & Barrows 2006; Hmelo-Silver 2004). Findings also point towards student efforts to enhance the group's understanding, in contrast to traditional instruction methods (Hung et al. 2008; Strobel & van Barneveld 2009). There is also strong evidence that the method has positive effects on competency after graduation and entering work life (Choon-Huat Koh et al. 2008). A drawback is that PBL is cost- and staff-demanding, time consuming for both teachers and students and displays no positive impact on student knowledge on standardized short-term tests base compared to traditional teaching (Strobel & Barneveld 2009).

### **Case-based learning**

Case-based learning is a predecessor to problem-based learning where a common denominator is to challenge students in handling realistic problem situations presented in whole-class situations; often in seminar settings but can also be applied in breaking up lectures. The timing of the case scenario varies widely, from the start to the end of a teaching session (Baeten et al. 2012). The method draws on similar characteristics of PBL regarding mobilizing prior knowledge, but differs in not applying the seven-step approach. The work is usually more teacher-driven, often supplemented with brief lectures and/or workshops, and confined within a specific area of the curriculum (Struyven et al. 2011). To some extent, the teacher's role is both to coach the students and supervise the casework without lecturing. The CBL method is usually based on long-term group work.

Research on CBL indicates some interesting findings on high student motivation, enabling collaborative skills and disciplinary, problem-solving strategies (Alexander & Mayer 2011). The few studies with methodological rigor show more varied results with respect to academic content learning. These findings demonstrate the importance of scale and timing in implementing the method, suggesting that a mix between traditional lectures and CBL leads to the most profitable teaching and learning outcomes (Baeten et al. 2014; Gijbels et al. 2014).

### **Project-based learning**

Project-based learning involves students in pursuing projects that involve real-world activities of experts, (Krajcik & Blumenfeld 2006). It is characterized by students' pursuing knowledge with a clear, shared goal for the group and by asking questions they raise themselves within a course topic. The questions guide students in investigating a disciplinary issue under a teacher's supervision, which is expected to result in a product (report, experiment, findings, etc.) to be presented and assessed in the end (Spronken-Smith & Walker 2010). Students pose such questions based on their own prior understanding of a phenomenon and gain ownership of its knowledge-based explanation by delineating the scope of the self-defined problem, thus learning to describe and pursue an academic issue comprehensively and to be accountable in presenting the findings. The teacher's role is to supervise students in their choice of methods and use of theories, as well as assessing the project outcomes (Loyens & Rikers 2011). Learners are usually provided with specifications for a desired end product, and the guidance is more oriented toward particular procedural aspects. In recent years there has emerged a practice of carrying out customer projects, especially in business, engineering, and design studies (e.g. McDonagh & Denton 2005; Seitamaa-Hakkarainen et al. 2005).

Empirical research on PjBL is often confined to local study programs (Loyens & Rikers 2011). Available empirical findings document positive features such as student motivation, experience of knowledge relevance (Chu 2009). On the negative side are complex logistics and assessment, extensive use of time, and difficulties in aligning with other courses (Aditomo et al. 2013; Helle, Tynjälä, & Olkinours, 2006). Prior findings have suggested that interdisciplinary or multi-professional learning is argued to amplify relational, mediated, transformative, and situated dimensions of learning and creativity (Litzinger, et al. 2011). There is, however, a need for more clarity concerning how customer requirements influence student engagement and inquiry. A general critique is that educational practices of project work reduce knowledge to static entities, where problem-solving

appears as linear, unambiguous, and de-contextualized (Bucciarelli 2003). From the view of learning as knowledge building, creation, or construction, this model has to withstand the question of giving sufficient space for inquiry and original contributions.

### **Inquiry-based learning**

Inquiry-based learning is the widest category of the student-centred approaches addressed in this review, and comprises a range of activities emphasizing investigative work with knowledge to facilitate students' active participation (e.g. Aditomo et al. 2013; Spronken-Smith & Walker 2010). A main characteristic in IBL is open-ended, student-directed inquiry or research, with the potential to elicit a critical mind-set and problem solving (Aditomo et al. 2013). IBL can comprise a diversity of approaches in problem-solving and case scenarios, different ways of distributing responsibilities between teachers and students, variations in degree of support from teachers and aims of the process (Levy 2008; Aditomo et al. 2013; Levy & Petruilis 2011; Prince & Felder 2007). The teacher's role in IBL is commonly as a guide and supervisor, helping students refine queries, hypotheses, and arguments, as well as use of relevant sources and resources. One specific application of the inquiry-based learning principle is the progressive inquiry model (Muukkonen et al. 2004), which represents an instance of how inquiry-based learning is translated into small-group learning situations, and emphasizes creating knowledge artifacts as part of the inquiry process and product.

Empirical studies on IBL commonly focus on the deep processing of scientific knowledge and how students make sense of concepts (Veermans & Lallimo 2007), the self-regulation of inquiry and students' engagement (Muukkonen et al. 2004), or how the inquiry process can be supported (Muukkonen et al. 2004). Positive findings indicate a strong link between teaching and (disciplinary) research (Brew 2010; Spronken-Smith & Walker 2010), and supporting student research and knowledge production (Zimbardi & Myatt 2012) and opportunities to materialize ideas and products based on collective achievements (Chan et al. 2001; van Aalst & Chan 2007). Research results also show improvements in collaborative work in small groups and in conceptual and deep learning (Damşa et al. 2010; Damşa 2014; Minner et al. 2009; Muukkonen & Lakkala 2009; Muukkonen et al. 2010). Other findings indicate that IBL appears to be useful at the start and the end of study programs, which are important phases in students' enculturation in the knowledge domain (Spronken-Smith & Walker 2010). On the negative side are difficulties in accomplishing both knowledge production and active and collaborative participation simultaneously (Damşa 2014; Muukkonen et al. 2010). IBL is also related to the character of knowledge domains. An indication of this is that students in humanities and social sciences experienced it as active learning, but still described the activity as knowledge gathering (Levy 2008). Moreover, IBL methods do not demonstrate clear benefits for low-achieving students, in comparison with traditional teaching methods (Lewis & Lewis 2008; Wilson, Taylor, Kowalski, & Carlson 2010). Hence, profiting from inquiry-based activities is not a straightforward issue, and careful support is thus needed (Damşa 2014; Muukkonen et al. 2004).

### **3.2.4 Research in the Norwegian context**

In the Norwegian context, research that focuses on pedagogical approaches in higher education and their ways of supporting learning has been scarce, at least when it comes to studies that investigate this as unfolding processes. Some examples do exist, however, and in recent years the Education 2020 and the FINNUT programs of the Research Council of Norway have funded several projects focusing on higher education, of which some are still in progress. We will review these studies following the same structure as for the review of international research above.

#### **Organized discussions**

Havnes' study of *peer-mediated learning* (2008) has generated an interesting account of how peer learning can be less effective in curriculum context, when organized rigidly, but can generate different ways of interacting among students that can lead to learning outcomes. The study aimed at using data from a Philosophy of Science course at university level, with a high attendance (thousands), in order to address the impact of student participation in educational activities. The course attempted to use

colloquium groups as the main form of activity for students, besides the lectures, to work on assignments, which were to be graded. The results showed that work in these groups was mainly structured by tasks given by the teacher, was heavily examination-driven, with a limited set of examples provided in lectures as a model of activity and problems to solve. The students perceived this work strictly as an exercise preparing them for the final exam. In parallel to this institutionalized colloquium work, the students engaged in interaction outside the institutional context, but still on-task, related to the assignment and learning activities. The results demonstrate that the type of peer learning that took place contributed to relevance not only to the curricular dimension but also to a better understanding of the knowledge content in the context of their daily lives, and the students developing a sense of agency and identity of being a participant in a larger discussion than only the one taking place within the course boundaries. The study argues for the value of peer-mediated learning, as opposed to teacher-mediated, since it includes both curricular and extra-curricular learning. Such a combination allows students to learn to master the disciplinary knowledge, but also to appropriate this knowledge outside the pressure created by the assessment and to create a community that supports a different way of engaging with learning activities and this knowledge.

Postholm (2008) examined what enhances and impedes group learning from the perspective of the students, and looked at how undergraduate students enrolled in a research methods course organized and conducted group work. The findings point to the benefits of group work indicated by students and identified in the activities: learning the syllabus, by reading, talking and writing together; developing abilities to understand each other's ideas; using diversity in the group as an asset instead of weakness. In the writing process required by the task, working together appeared to be an impediment, because of the differing writing styles. The teacher was perceived as facilitator, source of feedback and continuous guidance, indicating a lesser degree of autonomy of students in organizing and conducting the group work; this aspect corroborates findings from international studies indicating that group/peer-learning appears to be beneficial when structured and guided by the teacher.

### **Student-centered approaches**

Medical education in Norway has a history of experimenting with and implementing *problem-based* learning. Empirical research from an education perspective is, however, not extensive. In a comparative study of problem-based and traditional learning settings, Lycke, Grøttum and Strømsø (2006a) examined the learning strategies, mental models and learning outcomes of medical students. The findings indicate no significant difference in learning outcomes, but the PBL students displayed more self-regulation, more constructive conceptions of learning and higher appreciation of discussion with peers. From an educational practice viewpoint, the study showed that PBL can promote more active engagement in group activities and a more active and broader use of the resources than traditional programs, and that it can influence positively student learning strategies. In another study of the role of the tutor in classic PBL and online PBL settings, Lycke and colleagues (2006b) show that the tutor performance is situation specific. When PBL is organized online, the tutors relate to different characteristics and challenges of the learning environment. This requires both a high degree of skill in working with the technology and an increased repertoire of tutoring approaches and understanding of how these could be applied.

The literature suggests that a direct transfer of knowledge and skills of PBL by students from a classic to an online learning context should not be taken for granted. Modeling, coaching and fading are recommended as strategies to support students in this process. Finally, in a study of computer-mediated communication in problem-based learning about legal issues in medicine, Strømsø, Grøttum and Lycke (2007) have concluded that the use of CMC environments offers both restrictions and opportunities for problem-based learning. When elaborating and specifying aspects of the problem solving process and content, face-to-face settings appear to be more suitable. Also, technical matters seem to distract participants' attention from the PBL process itself. Some aspects of problem-based learning, such as generating ideas, are well supported by technology, provided the process is closely guided by the tutor. Also, technology promotes better and more continuous communication among the group members and tutors. The authors suggest CMC as a tool to make a stronger link between students' experiences in

clinical placements with theoretical knowledge; and that PBL using CMC should be better planned and structured ahead, and should be preceded by thorough training in using the technology.

A large project at the Norwegian University of Science and Technology (NTNU) called Experts in Teams (*Ekspertene i team*) specifically focuses on implementation of project-based work in the Civil Engineering program. This is an obligatory course for students at NTNU in various programs, and consists of learning and instruction for students with mixed background organized in classes and with classes in teams of five. Each class was under the responsibility of an instructor and an assistant. The goal of implementing such forms of interdisciplinary group activities and learning was mainly connected with the idea of supporting students to develop generic skills for work with knowledge, communication and collaboration. Hovdhaugen and Aamodt's (2005) evaluation of the *Ekspertene i team* course, highlights the positive student experiences regarding collaboration and the practicing of related skills, and still allowing the space for each individual contribution. While one of the main goals of this initiative was to offer opportunities to use disciplinary knowledge in the context of group projects, students were less positive about the way the Experts in Teams model met this goal. They emphasized the need for more grounding in the disciplinary knowledge domain and more support from instructors to deal with this challenge. From the participating instructors' perspective, there is a need for better training for instructors to deal with challenges associated with interdisciplinary efforts and the high degree of support needed for the students involved in the group work.

Another example of project-based work is an art course in teacher education *Spillerom – kunstpedagogisk arbeid med barn* at the Oslo and Akershus University College (Waterhouse Lorvik 2001). The aim of this project based educational course was to integrate the use of art in teaching across disciplines, demonstrating how the use of art can be organized in teaching and what experiences the students gain from this integrated work as kindergarten teachers. While emphasizing the notion of creativity, play and esthetics, the evaluation of the educational program reveals that the project method as such seems to contribute positively to the student learning community. However, while the students also report on the benefits of working across disciplines, they missed a more thorough introduction on how the different disciplines can be interlinked conceptually and thereby also support for conceptual reflection on how they brought together their practical implementation of art in their teaching experiments. These findings to some extent overlap the findings from the NTNU setting, in requiring a better disciplinary grounding.

*HORIZON*<sup>4</sup> is an on-going project at the University of Oslo, Department of Education, in which one strand of research focuses on examining how students in higher profession-oriented programs are introduced to, and take part in, their chosen knowledge domains by means of inquiry-oriented activities. Students' knowledge practices have been observed and documented in introduction courses in three selected programs: law, engineering, and a five-year teacher education program (*lektorprogrammet*). Each of these courses employs student-centered activities in their curriculum, with slight variations between the domains. In the legal education course, students learned to solve legal problems based on the analysis of a case; in the computer engineering program, a project-based approach was used to introduce students to web design and development practices; and in the teacher education course, students were to engage in inquiry activities while analyzing and reporting on practice-based cases. The findings based on a first round of analysis highlight opportunities and challenges for learning in the different programs' cases. In the *legal education* program (Jensen et al. 2015), the findings indicate that the introduction to – and training in – methodological principles for defining, exploring and solving professional problems in a structured way constitute a key mechanism of induction. Moreover, by examining and integrating different sources of knowledge while working systematically on a complex problem, the students get introduced to the wider machinery of knowledge construction that constitutes the field of law. Analysis from the *engineering program* (Damşa & Nerland 2014) shows that these students are introduced to standardized procedures for problem solving and product development, and are presented with versatile tools for supporting their

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<sup>4</sup> *Horizontal governance and learning dynamics in higher education*

work, such as tools for validating programming codes as they go. The teacher education students are introduced to a more eclectic and less structured knowledge domain (Damşa & Nerland 2014; De Lange & Nerland 2014). Connecting theoretical concepts from the literature to specific cases is emphasized in their enrolment process. In this culture, the availability of mediating tools and concepts is rather limited and the students thus face challenges in bridging the gap between everyday language and more theoretical concepts. Moreover, the procedural aspects of work are less transparent and accessible for the students.

The studies conducted in this project demonstrated that the way students participate in the process is influenced not only by their interest in the domain and the way they participate in learning activities, but also by how the program that facilitates their interaction with the procedures and objects is considered essential for becoming a knowledgeable professional. Depending on how the knowledge domain is organized, different mediating tools and support structures are needed for the students to make sense of knowledge and utilize resources in productive ways. To some extent, these differences are also related to the character of the inquiry task and the type of instructional support provided in the introductory courses examined. The knowledge structures and practices of the respective domains shape, to an extent, the nature of the problems to be addressed, the process through which this happens, and the availability and access to knowledge resources and networks in the students' inquiry processes. Based on these findings, the project suggests that further research and conceptualizations of IBL in higher education should go beyond the type of inquiry activities (e.g. distinctions between case analysis and project work) to account for the knowledge practices and resources that make up the domain-specific knowledge culture. They also highlight the importance of understanding how students learn through interaction and participation in collective inquiries, and engage in domain-specific practices allowing them to undergo the process of "becoming" professionals.

Last but not least, within the broad range of conceptualizations of inquiry-based learning, the notion of *research-based education or research-based learning* has been under discussion and scrutiny also in the Norwegian content. Given the lack of clarity around its meaning, the notion and its implementation is however, still being discussed among researchers and higher education programs/institutions in Norway as well. In a presentation of a recently finalized project on qualifying for professional careers, specifically how professional competencies develop in pre-service programs and the relevance of these to professional work they qualify for, Smeby (2014) highlighted that empirical examination is needed of: the purpose of implementing research-based learning, which should be to prepare students to be able to perform their work in a research-based manner, instead of trying to train researchers; the understanding of what the notion means in the context of professional programs (which is more than just taking part in research projects); and the relationship between research by the staff and teaching and instruction.

Within the same project, Kyvik and Vågan (2014) have conducted both a review of the notion of research-based learning in the literature and an analysis of how this notion is being understood and translated into the curriculum and practice in the largest higher education professional programs in Norway that qualify for primary and secondary school teaching, preschool teaching, nursing, engineering, and social work respectively. The findings show that research-based learning in practice is not clearly distinguished from inquiry-based learning, and even problem- and project-based learning. With regard to the percentage of educators in these programs (teachers, instructors) who conduct and use research related to their discipline, the results from self-reported data do not corroborate with the analysis of publication records; according to the former, it is between 10 and 35 percent, while the latter indicates between 30 and 60 percent, with the least involved in research in engineering education. There are differences between the disciplines, which are reflected also in the percentages of personnel using research in their instruction, with teacher education having the highest and engineering education having the lowest rate. The question raised by authors is whether the research environment and educators' involvement in research (or lack thereof) have an effect on the way students in these programs are themselves involved in research-based learning. Data collected among students and from official documents indicate that students consider themselves in possession

of theoretical and methodological knowledge and an idea of how research should be done. Fewer reported that they have concrete opportunities to develop research skills; and even fewer that teachers used (their own) research in their instruction. Variation is identified again among the different programs; with the nursing program including visible strategies to include research methods in the curriculum and the engineering education doing that to a far lesser extent. The study concludes that, generally, students in professional programs gain knowledge of research in different ways, but that they have fewer chances to develop an advanced understanding of research – how to conduct it and how to apply it for their professional practice. Only a fifth of the students reported to have been involved in conducting some form of research. While many of the teachers and programs indicate that they are aware of the benefits of using Forskning og Utvikling (translated roughly to 'Research and Development') activities in their curriculum, few have experience with it or consider it clear or easy to implement.

Finally, an empirical study by Munthe and Rogne (2015) has looked at how teacher education programs address (i.e. understand and implement) research for students, in the context of increased emphasis on undergraduate research as a way to qualify teachers for future professional learning and innovation. Based on survey data and interviews with teacher educators and students, the study concluded that programs address this issue in varied ways; they all appear to emphasize research, but rather in the teacher-led form than based on student engagement. More specifically, academic writing, under close guidance, is emphasized more than reading of international research. The authors also point out that while the number of faculty and PhD students conducting research on teachers and teaching has increased, the goal of research-based practice remained still unclear to many teacher educators.

To sum up so far, the studies at both international and national level emphasize the need for a better understanding and further examination of the various forms of inquiry-based learning and research-based education, both from the perspective of the classroom practices and from an educational policy perspective. Moreover, while student-centered approaches and the involvement of students in research receive increased attention in Norwegian higher education research, few studies have looked into how this is enacted as evolving practices, or the challenges faced by teachers and students in this respect.

### **3.3 Assessment and feedback practices**

The concepts of feedback and assessment are very closely related and in an educational setting one concept can hardly be investigated without taking into account the other. Assessment will always lead to some kind of feedback to the student. In the tradition of understanding learning as a process of mutual influence between learners and their environment, feedback is a central theme, as mutual influence without feedback is by definition impossible (Bangert-Drowns et al. 1991).

Assessment has been called the "Achilles' heel of quality" in higher education (Knight 2002, p. 107), and there is widespread agreement that more attention to this aspect of educational practices is important to enhance student learning. Hence, the academic literature on feedback and assessment in education is extensive and has been steadily increasing over the last decade. One of the most comprehensive reviews on this topic has been conducted by Evans (2013) which is based on 460 articles. Evans (2013) decides to use the umbrella concept "assessment feedback" to capture the diversity of definitions and types of feedback that are covered in the literature. It includes all feedback exchanges generated within assessment design. Assessment design can be of formative and summative nature. While formative assessment can be defined as a process that is aimed at bridging the gap between the actual level of performance and the desired learning outcome, summative assessment is concerned with summing up the performance status of a student towards the end of a learning process (Sadler 1989). Much attention has been given to formative assessment in the literature, while summative assessment has the reputation of being of little use for advancing student learning. However, Bennett (2011) points out that it is not helpful to assume that the only purpose of

summative assessment is to document what students know without advancing and shaping this knowledge.

### **3.3.1 Principles of productive assessment feedback**

We will now outline several principles of productive assessment feedback in higher education. In general the findings on productiveness of assessment feedback are often very inconsistent and contradictory (Shute 2008). Nonetheless, there is a growing body of evidence of what is seen valuable and most authors agree that a holistic approach drawing on socio-constructivist principles is the best way to understand what makes assessment feedback productive (Boud 2000; Juwah et al. 2004).

As mentioned before, educational assessment never takes place without including some kind of feedback. This means that assessment feedback should be conceptualized as a part of an ongoing developmental process that supports learning in a teaching-learning environment, as well as in future situations in which learning is required, such as in an employment setting (Hounsell et al. 2008). With regard to practical implementation this implies that both summative and formative feedback should be seen as part of the whole learning process, and methods of assessment and feedback should be constructively aligned with learning objectives (Rust 2002). This means that the feedback given should be relevant and adapted to the purpose of the task (Nicol & Macfarlane-Dick 2006).

Moreover, if feedback is understood as an ongoing process that continues after graduation, it is important to ask how sustainable certain feedback practices are. Especially in the context of the current life-long learning debate, it is relevant to discuss the productiveness of feedback practices in a long-term perspective (Carless et al. 2011; Hounsell 2007). The importance of students developing the capability to operate as judges of their own learning should therefore be kept in mind when developing curricula and feedback practices (Boud & Molloy 2012).

A central concept in Sadler's (1989) work is the idea that assessment is based on "qualitative judgments" which he defines as judgments "made directly by a person, the person's brain being both the source and the instrument for the appraisal" (p. 124). He argues that qualitative judgments are part of most disciplines and are normally used to assess complex learning outcomes. One of the pitfalls of qualitative judgments is that they are mostly based on tacit knowledge and experience. Teachers often have difficulties in developing external, objective standards, which leads to a mystification of the assessment process for the student. Rust (2002) argues that it is important to create non-threatening assessment systems which entail that assessment process and criteria should be explicit and transparent to the students. Indeed, findings show that the more specific and clear feedback is, the better it works (Shute 2008). Several authors have suggested methods of giving more explicit guidance by use of exemplars, clear assessment criteria and clear signals of what is understood as good work (Nicol & Macfarlane-Dick 2006; Rust 2002; Sadler 1989).

Another factor that is of relevance for productive feedback is goal-directedness of feedback which describes the extent to which feedback provides information about where the student stands and which next steps a student should take to reach his or her goal (feed-forward) (Hattie & Timperley 2007; Shute 2008). DeNisi and Kluger (2000) have argued that feed-forward has greater potential than feedback in enhancing learning. This implies that feedback should include information about how to improve performance and include a formal goal-setting plan. This also requires that feedback does not provide learners only with verification but also with elaboration of the performed task (Shute 2008). In terms of study program design, it is important to align assessment methods in a way that feedback on one task is relevant for future tasks and can help the student to move forward (Nicol & Macfarlane-Dick 2006).

Even though there is a general shift towards student-centered approaches in today's higher education, a student-centered approach to assessment practices has been slower to emerge (Nicol & Macfarlane-Dick 2006). Instead, feedback practices are mainly still perceived as a top-down information transmission process dominated by the lecturer. As pointed out by Tee and Ahmed (2014),

this is problematic as it ignores the way feedback interacts with the identity, the beliefs and motivation of the students. They argue that it is important for a productive feedback practice to use a pluralistic approach that emphasizes the importance of engaging the student as an active learner and promoting the diversity of feedback forms by integrating teacher assessment, self-assessment and peer assessment.

However, the literature has yet to agree upon the role of the student in productive feedback practice. While some authors stress the importance of involving students in dialogue to facilitate their capacities for self-regulated learning (Black & McCormick 2010; Carless et al. 2011) others have raised doubts regarding the capability of students to make informed choices and obtain the skills to participate productively in the feedback process (Krapp 2005). In contrast, Boud and Molloy (2012) argued that students are playing a key role in driving learning by generating and soliciting their own feedback. A strong case for the importance of an active student role has been made by Nicol and Macfarlane-Dick (2006). In their work they explore how different feedback practices can be helpful for enhancing student's self-regulation skills. Research has shown that in order to become self-regulated learners, students need to have in mind some goals against which performance can be assessed. Feedback can be of an internal nature, generated by the students themselves, or it can be external, which is then interpreted actively in relation to the internal goals. Their model puts the student at the center of the feedback process and they argue that learning takes place when the internal feedback gets aligned with the external feedback given by the lecturer. This is in line with the observation that even if all aspects of good feedback practice are being taken into account, in many cases it still fails to have any effect if the student does not actively engage with it (Rust 2002). Rust (2002) therefore argues that it is important to create feedback exercises that help students to engage actively with feedback.

### **3.3.2 Learning to give and receive feedback**

Feedback practice is often assumed to be an educational activity that does not need formal training but is a taken-for-granted part of any kind of educational interaction between student and teacher. However, the emerging idea of sustainable feedback practice and the increasing expectations of students' responsibility in the learning process have led to an acknowledgement of the importance of training students and teachers in how to receive and give feedback (Carless 2007; Nicol & Macfarlane-Dick 2006). Feedback practices can become more productive when teachers are taking part in professional development activities that promote understanding of feedback processes and review beliefs about the purpose and nature of feedback (Carless et al. 2011). If feedback practice and the active engagement with it becomes an integral part of the assessment design, it can help build learning communities among the students and limit the structural barriers to relationship building between teachers and students (Higgins et al. 2001). This also means that students should get the opportunity to train in assessment and feedback skills, for example by involving them in peer feedback or engaging them in self-assessment exercises (Carless et al. 2011; Rust 2002). Thereby one can engage students actively with the assessment criteria, either by discussing them or even letting them mark some examples themselves. This is important as research showed that explicit assessment criteria alone are not enough for producing better student performance, as long as students don't engage with the criteria and learn to interpret them. First year students in particular, could benefit from feedback training, as it helps them understand the requirements of the unfamiliar academic setting and creates a transparent and non-threatening learning environment (Rust 2002). Moreover, as pointed out by Gibbs and Simpson (2004) it is also possible to involve students in the design of assessment, negotiation of criteria and choice of assessment tasks.

Different studies have pointed to the importance of delivery, form and focus of feedback. For example, Hattie and Timperley (2007) identified four focus levels of feedback which differ in the extent to which they are productive in different learning settings. While *task feedback* has the only purpose to clarify aspects of a concrete learning task, *process feedback* focuses on what a learner can do to proceed with a task. *Self-regulation feedback* is aimed at developing metacognitive skills of the students and *self-feedback* is focused on personal attributes of the learner. Kluger and DeNisi (1996) pointed out how much the affective dimension of feedback can influence the productiveness of feedback. They

emphasized the importance of directing feedback at the task only and avoid addressing any part of the person's self-concept, as this might be perceived as threatening for the ego of the recipient which in turn has a negative impact on the learning outcome. On the same terms, Shute (2008) pointed out the importance of taking into account affective components when investigating outcome performance of feedback practices, a thing that is frequently ignored in research on feedback. This means feedback that focuses the learner on aspects of the task is likely to promote learning and achievement, while feedback that draws attention to the self can actually impede learning (Kluger & DeNisi 1996). This implies that feedback should contain mostly information relating to performance improvement and only little information concerning the relative performance compared to others (Kluger & DeNisi 1996).

In order to understand the outcomes of feedback practices, it is important to take into account the conditions under which they take place and the characteristics of the actors involved (Narciss & Huth 2004). Shute (2008) calls feedback interventions "double-edged swords, cutting both ways", because there are conditions under which they do good and other ones in which they might impede learning. Two of the major impact factors discussed in the literature are students' and teachers' perceptions and contextual factors.

It is a widely accepted idea that students and teachers have different perceptions of teaching and learning interactions. Consequently it is important to take into consideration the differences that can exist between the perceptions of the actors involved in the feedback process. Trigwell, Prosser and Waterhouse (1999) summarized several findings that show clear indications that students' and teachers' perceptions of the teaching and learning environment are strongly related to the quality of their learning and teaching and to the quality of students' learning outcomes. However, many findings in the literature are focused on these interactions in the secondary school context, while there has been a relative lack of research of the interactive nature of teaching-learning situations in higher education (Beaumont et al. 2011). Bennett (2011) argued that educational assessment can be understood as an inferential process, in which interaction with the student is necessary for the teacher to get access to observable indicators of what the student actually knows or does not know. However, the inference from the observed performance to the underlying knowledge and understanding is not flawless and can be biased and influenced by other unknown factors. The feedback that is given will therefore always be dependent on the ability of the teacher to observe the most relevant indicators and to draw the correct conclusions. Bennett (2011) argues that teachers should try to decrease the amount of uncertainty and bias as much as possible, e.g. by considering data from multiple sources, occasions and contexts.

The combination of stable and changing individual and contextual factors make it challenging to investigate feedback as a distinct process at a certain point in time and space (Boud & Falchikov 2007). As both student and lecturers are often traversing different knowledge domains simultaneously and over time, it is important that productive feedback practices take into account the socio-cultural and institutional context. As shown by Crossouard and Pryor (2009), there are differences in the understanding and the practice of feedback between knowledge domains. The same authors point out that what counts as legitimate knowledge is in fact dependent on the institutional discourse and the assessment demands (Crossouard & Pryor 2009). Bennett (2011) adds that the productiveness of assessment and feedback will be limited by the nature of the larger system in which it is embedded and believes that assessment should be best conceptualized within the context of a specific domain and be embedded in the curriculum accordingly. The complex and changing learning environment in higher education and the workplace makes it difficult to develop a feedback practice that is sustainable over time. Another contextual factor that needs to be considered is the level of education of the learner. There are indications that directive feedback that gives direct instructions works better for students in early stages of learning, while facilitative feedback that supports the students to engage deeper in the topic is more appropriate for more advanced students (Shute 2008).

### **3.3.3 Research in the Norwegian context**

Little research is available that focuses on feedback and assessment practices in the Norwegian higher education context. Some research was triggered by the introduction of the Quality Reform of Higher Education which called for more learning-oriented assessment methods and more feedback for students during the course of their studies. This led to an increase of new assessment methods such as modular examinations, projects and portfolios. As a response, some researchers started investigating the implementation of portfolios as a new type of assessment in Norwegian higher education institutions (Dysthe & Engelsen 2004; Dysthe et al. 2007). The authors argue that Norway is going through a transitional phase where cultures of learning and assessment are changing and existing side by side within the institutions. While the introduction of portfolio assessment has triggered formal changes in the assessment procedures at some institutions, a positive effect on student learning can only be expected, if a general change of assessment culture and teaching practice is taking place at the same time. Otherwise, it is likely that portfolios will be used only to document knowledge reproduction, instead of contributing to the actual goal of enhancing students' capacities of independent knowledge production (Dysthe & Engelsen 2004). As the implementation of portfolio assessment is still at an early stage at most institutions, the authors consider it important to encourage experimentation as well as sharing of experiences across disciplines instead of imposing normative definitions (Dysthe et al. 2007).

Another change introduced by the Quality Reform concerns the role of external examiners. Norway has a long tradition of using external examiners during examinations and grading. However, after the reform, external examiners were assigned several additional tasks, such as contributing to improving the current assessment systems. A case study at NTNU showed that it was perceived as helpful by the subject teachers to include the external examiner in the negotiations of assessment criteria. At the same time the findings indicated that external examiners often had insufficient academic background and experience to provide a proper evaluation of the assessment method (Myrhaug et al. 2004). Based on those findings, it was recommended to provide better training for the external examiners to prepare them for their multiple roles, for example in form of an apprenticeship model.

Very recent research has focused on the assessment procedures of Norwegian PhD theses (Kyvik 2013). Based on a survey with foreign PhD examiners, the Norwegian PhD assessment system was compared with the systems in the USA, the UK and Sweden. Norway was perceived as being particularly formal and putting the candidates under rigorous scrutiny. While many foreign examiners had a generally positive impression of the Norwegian system, some also had critical remarks. Particularly the practice of publishing the thesis before the public defense was considered problematic by several foreign examiners, as the candidate has no opportunity to integrate the feedback received from the examiners. However, this critique was mitigated by the argument that the need for amendments after the defense is less important in the Norwegian system due to the extensive quality assessment preceding the submission of the thesis.

## **3.4 Teaching and learning in technology-rich environments**

The emergence of technology-rich teaching and learning environments<sup>5</sup> has changed the facilitation and delivery of higher education. During the last decade, net-based learning is no longer a core business only for universities with distance education as a mission; it has also been integrated into the student learning experience by predominantly campus-based universities (Bates 2014; Allen & Seaman 2014; Fosslund 2015a). The phrase "technology-rich learning environments" refers to environments in which teachers and/or students use technologies for diverse educational purposes.

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<sup>5</sup> When we refer to other researchers' original studies or theory, we use the concepts they use in their publications, but when we refer to the overall concept in the text, we prefer technology-rich learning environments also to avoid the historical connotations associated with terms like e-learning, distance learning or online learning.

Research on technology-rich learning environments includes numerous studies, disciplines and methods that both confirms and rejects better learning due to technology. Research and evaluation studies (both large scale and small scale) have been performed to determine the educational effectiveness of technologies when used for teaching and/or learning (Kirkwood & Price 2013). However, the overall picture of this research seems to be provided by researchers who are “tech-optimists” and less by critical approaches (Selwyn 2014). Even though the use of digital technology provides educational possibilities, there are no reasons to assume that all ICT-mediated practices would be educationally beneficial, supporting the students learning process or aspirations of becoming a critical being (Enyedy 2014; Hakkarainen 2013, Fosslund et al. 2015; Barnett 2007). Like in pedagogical approaches in general, technology-supported practices vary from more teacher-centered to more student-centered approaches, and their ways of enhancing student learning is dependent on careful design as well as alignment of various curricular elements (Yelland et al. 2008; Mishra & Koehler 2006). In this section, we first present an overview of different models for technology-supported teaching and learning. Next, we review research that sheds light on what matters for quality in the various models, and end with discussing recent studies and emerging needs in the Norwegian context.

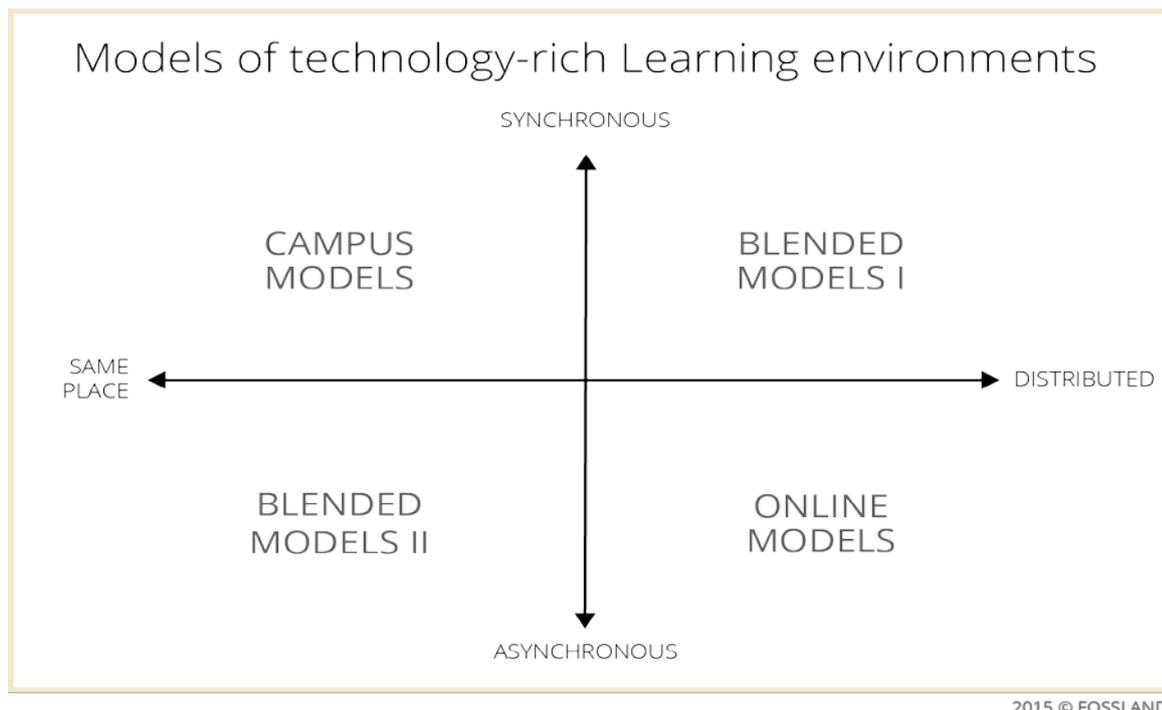
### **3.4.1 The “where” and “when” of technology-rich teaching and learning environments**

Several concepts address quality issues regarding the use of digital technology for educational purposes within higher education institutions. Among these are e-learning, net-based learning, technology enhanced learning (TEL), ICT-supported teaching and learning, computer-supported collaborative learning (CSCL) and online learning.<sup>6</sup> These various concepts derive partly from different stakeholders and disciplines, and relate to diverse sets of classifications, definitions and actual spread and uptake. Technology-rich learning environments serve as an overall term that includes teaching and learning activities supported by the use of digital technology in different models of higher education, like campus-based education, various blended models and pure online models. The understanding of the use of digital technology in different models of higher education is proposed in Figure 1 (Fosslund 2015a).

The figure illustrates four main models with different blends of face-to-face (so-called synchronous) and online (so-called asynchronous) teaching and learning settings, indicating a time lag between teacher and students' interaction. The four various models are; 1) “*Campus models*”, where digital technology is used in campus based settings, that happens at the same time and place; 2) “*Blended model I*”, where the use of digital technology is used where the students only meet online, at the same time from different places; 3) “*Blended model II*”, where students combine online meetings and physical meetings (like much vocational education; and 4) “*Online models*”, a purely net-based educational model, where students work, and in some cases “meet”, asynchronous (like different models of MOOCs and other “pure” online education). Even though four main educational models for the use of digital technology in higher education are identified here, the organizational framework for teaching and learning may range from 100 percent online, different combinations of net- and campus-based education, to almost 100 percent campus-based delivery for some courses.

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<sup>6</sup> Because the classifications, definitions and use of different concepts vary, we use the concept online learning when we go into reviewing research that use this concept, as this is the most common used term. Even though the terms e-learning and online learning are the most frequently used concepts, “electronic learning” and the distinction between off and online learning seems a bit old fashioned and does not cover the diverse use of digital technology in higher education today.



**Figure 1: Different models of technology-rich learning environments in higher education**

Technology use in higher education is therefore, as illustrated above, a broad phenomenon stretching from pure online-learning, to blended settings involving all sorts of learning management systems, presentation tools as well as a wide range of incremental digital resources. The use of digital technology is stretching from physical classroom settings to group tasks and individual assignments delivered by students situated in different parts of the globe. In the next sections we review research related to quality in the various models, but first we will discuss some overall themes related to social media and the changing of teaching practices that involves the use of digital technology in all educational models in higher education.

### **3.4.2 Changing teaching practices**

Technology has changed teachers' practice (see for example Kirkwood 2009; Bergström 2012; Fossland 2015a), in that technology use has emerged as a particular competence needed for teaching and learning. Teachers are to find the appropriate mix of different knowledge fields, such as pedagogies, subject-related expertise and technologies (see for example Koehler et al. 2007; Prestidge 2012; Krumsvik 2008). Moreover, studies report that higher education institutions that apply ICT in teaching and learning actively are most likely to include professional learning communities involving teaching staff and technology-savvy staff (Unwin 2007; Tamin et al. 2011).

Social media involve all educational models and introduce users as producers of content in various ways (Hakkarainen 2013; Rennie & Morrison 2013; Fossland 2015a). These activities include for example blogs, Facebook and YouTube and the like, and they are increasingly used for teaching and learning purposes in higher education. When reviewing studies on social media in higher education institutions, one central finding was that students reported to be most likely to adopt technologies that in various ways contributed to their flexibility and convenience, and less to actively produce content themselves. This way, students were not active producers of content, but on the contrary consumers of learning content (Eshet 2004; Conole & Alevizou 2010). Similar findings have been confirmed by later studies such as OECD, 2012; and in Norway by *Digital Tilstand* (Norgesuniversitetet 2015). Other technological devices are also increasingly introduced for teaching and learning purposes in higher education institutions, for example "clickers" or "student-response-systems". These provide, for

instance, teachers with feedback from students in lectures where the results can be available for discussions as graphics or diagrams. Studies have documented higher engagement for the students (Chen et al. 2010) and improved lectures, or better adjusted lectures, to the group of students in question (Beatty et al. 2006). The design of questions, teachers' response and small group discussions are central to learning (Anthis 2011; Beatty et al. 2006) and mobile learning (Kearney et al. 2012; Pachler et al. 2009; Pachler et al. 2010).

Digital tools and resources can be used to facilitate student activity in various ways like digital storytelling (Lambert 2010), the use of digital cases (Fosslund 2015a) and digital e-assessment (Bergström 2012). Assessment in online learning and assessment in on-campus courses may differ and equate in various ways, and relate to the educational model on which the courses are founded. Digital e-assessment is another huge research field addressing the quality of the students' learning process (Fosslund 2013a; Boud 2010; Bergström 2012). Bergström (2012) studied the development of education through the innovative use of process-based assessment in technology-rich learning environments in teacher and nurse education. The study assessment addresses the aim of creating a better understanding of the shift in emphasis from teaching to learning with regard to theory and practice. The research questions address the use of process-based assessment, and how the social relationships and issues of content are understood in technology-rich learning environments.

### **3.4.3 Technology and pedagogics in campus-based settings**

Research on the use of digital technology in face-to-face settings in higher education is fluctuating and often related to specific disciplines and educational contexts. Starting with the teacher's intentions of technology use, recurring studies indicate a strong relationship between conceptions of teaching and practical implementation (Price & Kirkwood 2011). These findings reveal a tendency where teachers with a transmission focus on knowledge and learning appear to implement technology as supplementary devices to existing practices. The main focus here is on improving existing teacher performance, especially in presentational use, but not on changing the teaching and learning practices in any substantial ways. This is contrasted with student-centered teachers who tend to use technology in more innovative ways by focusing on how digital resources can be used to transform previous teaching into more student-engaging processes. This last group also tends to experiment with technology in ways allowing students to manipulate, question, reflect and create knowledge products (Kirkwood & Price 2013). How technology is applied in higher education is to some extent related to knowledge perspectives in specific disciplines.

The use of technologies to support the organization of learning activities at the course level is another issue addressed in research. An important focus here is to what extent the technology is aligned with educational goals and how it is structured into the curriculum and assessment practices, thereby grasping more of the totality of the student learning environment (Kirkwood & Price 2013). Again, the notion of knowledge and learning is of vital importance concerning implementation strategies, which can vary from supplementing existing curriculum to transforming and developing new practices. An example is typically the implementation of learning management systems which can be applied as an information platform and controlling device (extending existing education), while other strategies display transformative efforts in promoting student interaction and knowledge sharing in a learning community. There are also examples of digital tools coordinating instructional settings with student learning outside the classroom. These last mentioned efforts are often based on developing working procedures initiated in the classroom by setting off self-regulated or collaborative student learning outside the classroom (Mueller et al. 2012).

*Technology enhancement* with respect to specific classroom technology use is based on a common denominator of how particular digital resources are used to solve specific learning tasks and challenges and how this influences student's learning (Crook 2012). A range of research documents interesting findings with respect to specific technology use and how this allows students to engage with knowledge. A main focus in this research is that technologies are designed to create specific tasks and learning experiences which are difficult to provide in conventional classroom settings. These

practices often display particular learning spaces for students such as simulations, demonstrations and hands-on performance such as in clinical training, crafting or maneuvering devices. There are several studies reporting stimulating use of technology related to this kind of practical training, which also can be achieved in simulated laboratory exercises (Cooner 2010).

Research on simulation technology displays positive outcomes on student learning with respect to technical skills and in developing abilities in evaluating and judging disciplinary tasks; especially in clinical training (Childs & Sepples 2006; Luciano et al. 2009). Knowledge gaps in the research on technology in classroom-based teaching relates to identifying how technology use converges from experimental use and documentation to conventional teaching. Other challenges are to identify inappropriate technology use in teaching and teachers lack of competence in digital tool use. Despite many optimistic findings related to technology enhanced learning in on-campus settings, a limitation is that this research to some extent is deterministic as it documents initial intentions of the technology. Moreover, research within this field tends to confirm findings from experimental use and innovative initiatives, thereby failing to address how teaching and instruction based on digital resources continues into conventional practices (Price & Oliver 2007). At the upside of this research is that innovative technology use has proven to expand many face-to-face learning environments by introducing digital solutions, which are difficult to create and implement in conventional teaching and instruction.

#### **3.4.4 Quality aspects in online learning including MOOCs**

Purely online and blended models of net-based education are associated with quality frameworks developed within European politics, national and international organizations.<sup>7</sup>

In addition, several studies suggest additional approaches to quality in online settings, such as the design of the learning environments that includes communication, collaboration, and supervision and interaction (Ehlers 2004; Aldridge et al. 2004; Adams & Granic 2009). These quality dimensions also underline the importance of the teacher's role as a facilitator and a driver for the social and relational parts of online learning (Salmon 2002; Bacow et al. 2012).

In asynchronous online learning, the communication and learning situation has been analysed through an analytical framework known as the Community of Inquiry Model (Garrison et al. 2000). Important findings suggest for example that asynchronous discussions facilitate active student participation, but this depends on structures placed by the facilitator (Palloff & Pratt 2007; Garrison & Cleveland-Innes 2005). Critical reviews of studies that apply this framework demonstrate however that only a very few investigate student learning (Rourke & Kanuka 2009). Compared with the amount of research related to asynchronous communication, less research addresses the learning situation in synchronous online learning environments (Asterhan & Schwarz 2010). One possible explanation might be that technologies that support real-time participation, such as chat and videoconferencing systems are newer and so is the research in this field. Some studies report however more intense interaction for students in synchronous learning environments compared with asynchronous (Hrastinski 2008, 2009), for example using videos, smart phones and social media has raised the increase of document sharing and synchronous meeting technologies (Anderson et al. 2007), which allow teachers to follow individual or specific group needs more closely.

Research has flagged difficulties in defining a MOOC compared with conventional online courses (Downes 2013; Bates 2014). The first MOOCs were promoted to provide students, or everyone who signed in, with video-recorded lectures from the best professors who were most likely to be affiliated to elite universities. This approach has been associated with quality in the sense that learners would get access to the world's best experts from various field and disciplines and their teaching. Recently, other aspects related to quality emerge, such as MOOCs' ability to optimize learning, for example by

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<sup>7</sup> For example the European Foundation for Quality in e-Learning (EFQUEL), the European Association for Quality Assurance in Higher Education (ENQA), and national initiatives like Norsk forbund for fjernundervisning og fleksibel utdanning (NFF) or the Swedish Högskoleverkets kvalitetskriterier. EFQUEL certifies institutions within higher education with "The Quality Label for the use of ICT in Higher Education" through UNIQUe. (EFQUEL 2011)

adopting designs that enhance interventions (Mazoue 2013; Conole 2013). The design of video-recorded lectures and their role to enhance students' engagement are critical. Guo and colleagues (2014) found that shorter videos engage and that video with personal feel and enthusiasm engage more than studio recording; drawing tutorials are more engaging than conventional slide shows and students engage differently with lecture and tutorial videos (ibid). The original teaching models deriving from MOOCs, based on openness and large-scale approaches are however weakly implemented in emerging MOOC initiatives (Chiappe-Laverde et al. 2014). The divergence is characterized by practices that are not founded on the pedagogies that MOOCs were based on. In particular, the aspect of openness is weakly integrated (ibid.). MOOCs more likely serve as drivers to innovate the pedagogics in higher education institutions in Europe, compared with the U.S (Jansen & Schuwer 2015). Moreover, when comparing MOOCs, most were well organized and scored well on presentation of course material, but their instructional design quality was considered low (Margaryan et al. 2015). Researchers have also questioned what type of education MOOCs provide. On one hand, there are students who want to complete a university or college degree and it is unclear to what extent MOOCs can serve those students. On the other hand, there are students that follow MOOCs who already have a higher education degree and take courses primarily to add or extend their existing knowledge (Hollands & Tirthali 2014; Conole 2013).

### **Blended models**

The instructional modalities/delivery media, methods, and the ratio of online and face-to-face instruction are important as they define what students are to learn (Graham 2006; Moskal et al. 2013). Blended learning also brings flexibility into student learning and to administration (Dziuban et al. 2006). When reviewing studies reporting positive finding on blended learning to purely online learning, Means and colleagues (2010) found that many of these studies did not equate curriculum materials, pedagogical approaches or learning time in the treatment and control groups, which again may indicate that these factors might influence the learning situation in both cases (ibid.). To conclude, research suggests that to proceed with studies that compare online or blended learning with conventional campus-based face-to-face instruction is a demanding process which involves numerous aspects in addition to the sole media use. Students learn together online, support mechanisms such as guiding questions generally influence the way students interact, but not the amount they learn, as reported by Means and colleagues (2010). Following this, the effectiveness is often questioned, because student interaction in online discussion forums does not necessarily mean that students are actively engaged in the learning process (McLoughlin & Mynard 2009; Robinson & Hullinger 2008).

Nonetheless, as technology has improved over the years and opened up for various ways of interaction online involving asynchronous and synchronous participation, studies have revealed that interactivity might influence students' online learning performance, including online discussion scores, exam scores and group project scores (Wei et al. 2015). When comparing students in traditional face-to-face instruction with online students, a review of the effectiveness of online learning found that online students performed slightly better than face-to-face-instructed students (Means et al. 2010) or the same (Bowen et al. 2012). However, research has also demonstrated that online students might have several advantages compared with students following face-to-face instruction, which may add other aspects into the learning context than purely the medium of instruction (Means et al. 2010; Jaggars & Bailey 2010; Bowen et al. 2012).

In summary, teaching and learning in technology-rich environments is widely researched, within different educational models. The important take-away message is: when it comes to the question of improving quality and the use of digital technology, this question is closely interwoven with the educational model in question. The lack of common understanding, fragmented approaches and locally-focused research profiles makes it challenging to map the research fields related to quality in technology-rich environments in higher education. Moreover, studies mapping the impact of technology and learning appear often to be based on assumptions and beliefs about the effectiveness of the educational uses of technologies, and this may again lead to unreliable or over-generalized findings. The understanding of technology rich environments and its possible impact on learning must

instead be closely understood in relation to the actual model of higher education that is studied, as well as the academic and pedagogic goals in every particular course design. Quality issues are both related to teachers' facilitation and the way students use digital technology to enhance their learning process. Teachers' digital competence is still developing, which also influences the students' opportunities for learning through digital technology and to develop generic digital competences such as digital reading and the like. In the next section, we discuss research in the Norwegian context.

### **3.4.5 Research in the Norwegian context**

The spread and uptake of digital learning resources and ICT in higher education institutions are still scarce and most likely for administrative purposes and for distributing learning content, and the fact that nearly all higher education institutions are using LMS Learning management systems (or VLEs) is a solid expression of this (Ørnes et al. 2011). Knowledge distribution and sharing content are important quality aspects, but it is not enough if the purpose is to facilitate quality learning in education using digital learning resources.

Computer-Supported Collaborative Learning (CSCL) is a research field for researchers who study ICT supported learning in groups, including those co-located and distributed. Ludvigsen and Mørch (2010) summarize key research findings and, in so doing, they distinguish between a systemic and a dialogic approach to the actual research. One aspect is central in both fields: the learning depends on the design of the learning environments, the social norms of the actors and the institutional settings (Krange & Ludvigsen 2008; Ludvigsen & Mørch 2010; Fritze et al. 2003). Other studies have also documented similar findings, like the importance of the design of the learning environments and the role of the teacher, clear structure, motivation and involving academic challenges (Fosslund 2015a,b; Fosslund & Laugerud 2008). Krumsvik highlights for example the teachers' capability of adopting subject-related digital learning resources for teaching purposes, namely professional digital competence (2008). Tømte and Olsen found that teachers in higher education institutions with this kind of competence also supported students to become active in their own learning (2013). This particular competence might be relevant for all teachers in higher education institutions, but in particular for teachers in teacher training programs, due to digital competence being included in the curricula.

In her study of "Digital innovators",<sup>8</sup> Fosslund (2015a) found extensive use of digital technology in these teachers' approaches to and facilitation of their students learning process. Digital technology was used to facilitate student activity and their learning processes using various digital devices and resources. One finding was that these experienced teachers were not that interested in trying out the latest news when using digital technology (as many of them were five to ten years ago). Their primary interest was how the use of digital technology within different educational models was suitable to facilitate the students learning and academic development.

Norwegian researchers have found that the advent of digital networks, multimodal representations, and Web 2.0 applications has resulted in increasing complexity in the learning environment (Lund & Rasmussen 2010; Lund et al. 2009). However, several studies have reported that professional digital competence is weakly adopted in teacher training, even in online teacher training programs where one could assume that this aspect would be a part of students' learning environments (Tømte et al. 2010; Tømte et al. 2013; Tømte et al. 2015).

Higher education institutions are increasingly adopting real time videoconference systems for teaching and learning purposes in online contexts where students and teachers are geographically dispersed. Studies, mainly qualitative, from Norwegian contexts report that teaching and learning are functioning well, both when it comes to technical and didactical issues; as long as the design enables students to engage in the dialogue (Nilsen et al. 2013; Tømte & Kårstein 2013; Fosslund 2013b; Dysthe & Lillejord

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<sup>8</sup> The concept refers to teachers in Norwegian higher education with extensive experience in the use of digital technology in higher education.

2012). Video records, both from lectures and studio-produced are also increasing within higher education institutions, and these may have diverse pedagogical purposes; some are produced as part of a “flipped classroom” mode, in that students watch the videos ahead of class, and some are made for allowing flexibility to students, both on campus and online (Hamdan et al. 2013; Tømte & Olsen 2013; Tømte et al. 2014). However, students and teachers have diverse opinions on video records. For example, students prefer to participate in real time lectures rather than video-recorded ones; these are mainly considered valuable ahead of exams. Teachers stress the need for contextualization of videos (ibid.). Studies of student response systems (Strømsø 2014), the use of social media (Krokan 2012), the use of learning management systems (Nordkvelle & Netteland 2015; Netteland & Nordkvelle 2013), digital storytelling (Jamissen 2013; Haug et al. 2012) are also performed in a Norwegian context, most commonly qualitative in scope.

Online studies in Norway are increasing, and even if most educational programs are blended in various ways, pure online educational programs also exist (Wilhelmsen et al. 2009; Børshem 2012; Tømte & Olsen 2013). Students in pure online programs are mainly adult learners who prefer to study from home at their own pace (Rønning et al. 2010; Rønning 2013). Fosslund (2015a) found that different groups of students have different needs when it comes to online learning environments, such as the need for social and professional contact with others. This was related to both what kind of educational model the students were involved in and personal characteristics of the students enrolled. Some students mainly preferred studying alone and within asynchronous contexts, and had their discussion partners outside higher education. Others, like some students groups participating in blended educational models, needed to be followed closely by a teacher in person.

### **3.5 The significance of disciplinary differences**

Program quality and ways of supporting student learning through well-designed teaching also need to combine the “hows” (teaching and learning approaches) with the “whats” (knowledge domains) of educational practices. In this regard, a range of studies have focused on the distinct features of academic and professional knowledge domains, and their implications for student learning and development. Brint et al. (2008) analysed data from a survey carried out among students across the University of California system, and showed how students’ experiences of academic engagement may be categorized in two different disciplinary groupings that were conceptualized as the humanities/social sciences and the natural sciences/engineering respectively. The study revealed considerable differences in norms and expectations to the students within these groupings, both where forms of inquiries, relationships with teachers, and modes of working were concerned. In a related vein, Jones (2009) conducted a study among teachers of five disciplines in two large Australian universities and showed that types of generic attributes, such as critical thinking, problem-solving and communication, are understood and conceptualized quite differently in different disciplines. A core argument following from her study is that such skills emerge through disciplinary forms of engagement and that these specificities need to be accounted for when we use concepts like generic skills and competencies. Other studies have focused on relationships between disciplinary characteristics and approaches to teaching or curriculum work, and identified important differences between domains when it comes to how educational quality is sought developed (Knight & Trowler 2000; Mårtensson et al. 2014); how student learning is supported through teaching (Hativa & Marincovich 1995; Neumann et al. 2002) and how knowledge is organized for educational purposes in the curriculum (Mueller 2009).

Some studies have focused on students’ participation and how they engage with the ways of thinking and practicing knowledge that characterize their prospective area of expertise. In UK, a study on knowledge practices and modes of engagement in undergraduate courses showed the importance of accounting for the distinctiveness of how knowledge is explored and produced as a basis for developing productive learning communities in higher education and socializing newcomers into the domain (Anderson & Hounsell 2007; Anderson & McCune 2013). In the Norwegian context, some studies targeting Master’s level programs have shown how different disciplines come with different

norms for academic writing, different logics and expectations for teaching and supervision, and different opportunities for student engagement (Dysthe 2002; Wittek & Habib 2013). Moreover, the previously mentioned research in the on-going *Horizon* project examines how students in profession-oriented programs are introduced to domain-specific knowledge practices through different kinds of inquiry activities. Preliminary findings show how different domains can be understood as distinct knowledge cultures or ecologies, in which knowledge practices, material resources and types of problems or objects to be worked upon constitute different learning environments and quality challenges for the teachers and students involved (Jensen et al. 2015; Damsa & Nerland 2014; De Lange & Nerland 2014). Making the procedural and methodological aspects of the knowledge domain transparent is thus critical to support newcomers' introduction to their prospective area of expertise (ibid.).

Common to these studies is that they question the feasibility of promoting pedagogical models and approaches that are believed to be valid across all knowledge domains. Both epistemological demands and the social organization of activities differ between knowledge areas. Hence, while research certainly has revealed sets of principles that seem conducive to good teaching and productive learning more generally, these studies underscore the importance of designing tasks and support structures carefully with the character of the knowledge domain in mind. Alignment with the disciplinary characteristics becomes itself an indicator of quality.

### **3.6 Aligning practices within course designs and disciplinary contexts**

The review of studies in the previous sections reveals a considerable variation in the types of pedagogical approaches and activities used in higher education, as well as a complex set of issues that matter for program quality. A powerful assumption, which also is supported by a range of studies, is that student-centered approaches are beneficial for the sake of fostering deep learning and capacities for advanced knowledge work. Problem-based learning can display positive achievements in collaborative knowledge construction, and enhanced understanding compared with traditional teaching approaches. Case-based teaching may potentially lead to higher achievement especially in problems-solving strategies, even though some of the results vary. Studies of project-based learning display similar findings, but in addition document high knowledge relevance. Moreover, inquiry-based learning reveals positive findings in supporting collaborative work and understanding research processes. At the same time, clear documentation of in-depth learning tends to become increasingly inconsistent in the studies based on more complex research designs (Loyens & Rikers 2011). Some research also indicates that the complexity of inquiry-based methods may stretch the learner's capacity too far (Kirschner et al. 2006), pointing to suggestions of combined traditional and inquiry-based methods, as well as gradually bringing students into the working principles of inquiry (Baeten et al. 2014; Gijbels et al. 2014). Hence, rather than regarding these approaches as isolated activities, the relationship between activities in courses and programs, and their internal alignment in the curriculum, is critical for program quality.

As such, student centered approaches also involve various ways of student interaction and response adapted to the given learning tasks, which is highly recommended in research documenting productive assessment feedback. Findings from research on feedback here underline the importance of providing clear and specific guidance, but also the importance of clear criteria which identify what is perceived as high quality achievements. Moreover, quality in feedback is related to providing information of the next steps to reach further learning advancement, also termed as feed-forward. A final challenge is that even though there appears to be a shift towards student-centered instructional approaches, feedback is still understood as a top-down information transmission. This last aspect is highly relevant to explore empirically in specific educational practices.

Seen together, the reviewed studies also point to the significance of disciplinary differences and how they frame student engagement. Some research indicates that certain disciplines, such as social

sciences, arts, and humanities, tend to be more successful in fostering deep learning through inquiry-based methods, compared with mathematics, natural sciences, and economics (Spronken-Smith & Walker 2010). Other studies have pointed to the importance of designing learning activities on the principles of the knowledge practices and logics of knowledge production that characterize the knowledge domain (Wittek & Habib 2013; Damsa & Nerland 2014; Jensen et al. 2015.) Hence, being aware of domain-specific practices and what they imply, and modeling the use of domain-specific tools and technologies, is important for securing the quality of teaching and learning. This issue is however in need of further research both with respect to what the different knowledge practices actually entail (Nerland & Jensen 2014) and what this means for curriculum development, learning tasks, teacher support, and assessment. And, as also noted by McCormick et al. (2013), although we know that a range of student-engaging tasks are also used in more conventional teaching environments, these are often poorly documented in terms of effectiveness and ways of enhancing student learning.

The review has also pointed to complicating issues and relations when it comes to the credibility of findings and the conclusions we can draw. For instance, student-centered approaches hold the potential of avoiding superficial approaches and encouraging deep learning but do not guarantee successful student engagement (Gibbs & Habeshaw 2002; Little et al. 2007). Hence, measuring educational quality from student satisfaction surveys and the mapping of activities alone is not sufficient. To learn more about the quality of (Norwegian) educational practices we need to study these practices in their specificity, and with attention directed both towards the specific factors that seem to matter in different pedagogical formats and to how practices are related within the educational and disciplinary context.

## 4 Conclusions and research implications

What do we know about the quality of Norwegian higher education on the basis of the current review? As illustrated in the previous chapters, it is possible to argue that much knowledge indeed is available, although we should also acknowledge that there are important knowledge gaps to be covered, and that we do not yet have a full understanding of the many factors that may affect quality. In this final chapter, we highlight the key insights stemming from our review and we discuss some of the puzzles and research challenges that can be identified.

### 4.1 The framework conditions and key outcomes of the Norwegian higher education system

As illustrated by the discussions in chapter 2, the Bologna process has been an important reform driver in Europe, including Norway, during the last decade, and many reforms have been “added to” the Bologna process at the domestic level. Hence, in Norway, changes in both the funding and in the governance of the sector can be noticed, and many of these initiatives have been in line with the modernization agenda within the EU. It is unclear to what extent funding and governance changes have contributed to improvement of the quality of the system as such. Part of the explanation for this is related to the fact that these reform efforts often have a broader agenda, including that of increased performance, improved effectiveness, accountability etc.

Compared with other countries, and taking into account studies conducted on the topic, it still seems that the issue of leadership of study programs and teaching and learning is a topic that has not been very high on the Norwegian reform agenda. Existing studies emphasize that there is a lack of close-up leadership at the program level, and that the responsibility of running the study program may be more in the hands of the administration than the academic leadership. To what extent this is true for the entire higher education system in Norway is less clear, and further investigations should be undertaken on this topic.

Existing studies also indicate that although external evaluations stemming from the national quality assurance system are followed up at institutional level, it is unclear what impact such follow-up has on the quality of teaching and learning. Hence, it is an open question whether external quality assurance impacts administrative organization of, coordination over, or the pedagogical content in study programs. These issues undoubtedly also have links to the issue of academic leadership, and the responsibility for, and involvement of, staff and students in the follow-up activities. How quality assurance affect the organization in question is therefore an interesting issue to pursue in further research. It can be assumed that the way “quality work” is organized within universities and colleges,

and how it is governed and led, also affects the outcome of the process. More in-depth studies of this question is needed.

An interesting, although less researched issue, is how buildings and the physical infrastructure affect quality. In general, Norwegian higher education has relatively updated buildings and infrastructure, and student satisfaction seems to be linked to how students perceive their physical learning environment, although it could be questioned to what extent the infrastructure is adapted to more recent perspectives on how learning takes place. Student-centered approaches are often conditioned by a learning environment that enhances dialogue and active student learning, and this may be at odds with how many current buildings and infrastructure are designed. The application of technology can probably play a key role in stimulating dialogue and student activities despite less relevant physical infrastructure. This assumption still needs to be tested empirically.

Looking at key inputs and outputs of the Norwegian higher education system, it is clear from the previous discussion that Norway has many similarities with other countries that have expanded their higher education system when it comes to the number of students admitted into the system in recent decades. This expansion is very much a result of a policy imperative, and reflects an increased demand for study places. However, the effect of this expansion is also well known: first, increased variation within the student population as such making it more difficult for higher education institutions to identify clear academic standards to use as point-of-departure for the newcomers. Second, an increased number of students that enter into the system also tends to reduce the funding per student (even if the general funding of the sector increases in total), making it challenging for the institutions to respond to the needs of the individual student. In our review, we also found that academic staff in higher education were dissatisfied with access to teaching assistants; this may be related to resource constraints. Third, increased access to the system and widening participation may increase the drop-out rate and lower the completion rates in the system.

Politically, the issue of drop-out and completion has received much attention during recent decades, and is still considered a key quality challenge of the system. However, as our discussion illustrates, this is an topic that deserves more reflection, and includes issues that go beyond quality as such. As underlined earlier in the report, Norway seems to enjoy a relatively smooth transition between higher education and work, and by taking more of a life-long learning perspective, one could even argue that the flexibility in the Norwegian system – that partly triggers both drop-out rates and completion rates – may be perceived as a positive characteristic of the system.

Finally, it should be underlined that there exists quite stable and consistent evidence to back the conclusion that a large majority of Norwegian students are satisfied with the quality of the education they receive, although they do point to areas where improvement could be made. Two repeated issues in this respect are the need for more feedback and the need for a more regular and systematic dialogue between teachers and students in the learning process. While students seem satisfied with the academic quality, they are less satisfied with the didactical framing of their studies. Interestingly, these are issues that seem to be important factors driving quality as will be elaborated below.

## **4.2 Mechanisms and drivers of quality in teaching and learning activities**

As illustrated by our review of the literature, it is possible to identify a number of pedagogical approaches to teaching and learning in higher education. And although there are no data that can shed light on the prevalence of the various forms of teaching and learning in Norwegian higher education, there is undoubtedly much variation found within the sector. The existence of such variation can itself be seen as an indication of quality, as monotony and too much standardization of the organization of teaching and learning activities may hamper student learning. However, quality is most likely not only just an issue of finding adequate combinations in pedagogical approaches. Our review suggests that quality is perhaps more about being conscious of for which purposes and under what

conditions different pedagogical approaches are productive. For instance, existing research points to the beneficence of engaging students in collaborative discussions and peer learning, which leads to general advice of supporting productive interactions between students as well as between teachers and students. Teacher-led activities (in lectures and online environments) may however be more efficient for the introduction of themes and distribution of information.

A running theme through the literature is the importance of facilitating ways in which students can take a more active part in the construction of knowledge in their studies. We identify a range of various student-centered approaches in our review, and as illustrated, a number of positive outcomes concerning student learning can be associated with problem-based learning, case-based learning, project-based learning and inquiry-based learning. Students increase their portfolio of competencies, they learn to collaborate, they increase their motivation, and these approaches may provide interesting links between education and research. At the same time these approaches also differ in that they seem to trigger distinct effects in student learning. Thus, a comparison of these approaches with respect to their similarities and differences on student learning could be of great help for those planning and designing study programs. At the same time, the literature review identified some common drivers of quality across student-centered approaches. These concern the importance of providing support in both the framing and solving of problems, monitoring student-led processes and intervening when necessary, encouraging the materialization of outcomes of discussions so that interim products can be further explored and developed, and supporting the social organization of collaborative processes.

Furthermore, and as illustrated in our discussion on assessment and feedback, it seems that many assessment and feedback processes are characterized by top-down information from the lecturer, and that peer learning – a key feature in a more student-centered learning approach – is often lacking. Assessment and feedback is also hampered by the existence of tacit knowledge as to how academic standards are understood; making such standards explicit and developing different student-centered feedback practices can enhance student self-regulation and motivation. However, this seems dependent on systematic training of both students and their teachers, not least acknowledging that there might be variations as to what assessment and feedback practices should be employed in the various stages during the study process. Giving clear and explicit guidance on feedback helps students to integrate the received feedback effectively in their learning process. Accordingly, feed-forward has been identified as the most productive type of feedback, as it provides information about where the student stands and which next steps a student should take to reach his or her goal. Moreover, feedback that focuses on specific aspects of the learning task, instead of referring to self-related aspects of the learner, tends to be more productive.

Technology might play an important role in both student-centered learning approaches and in various assessment and feedback practices, but research suggest that it is not the technology in itself, but the way technology is applied that is crucial for the outcome. For example, related to the many positive effects of stimulating students to be active learners and to strengthening connections between students and staff, technology might also be used in ways that force students into a more consumer-oriented and passive learning mode. Moreover, the way digital technologies are used, seems in part to be related to the participants' belief systems. Research indicates a relationship between tool use and conceptions of teaching, where teachers with a transmission-focus tend to implement technology as supplementing tools, while student-centered teachers display more innovative approaches. Again, it seems that variation and a careful incorporation of technology in the study program is of key importance, and that more blended learning settings are becoming more and more popular, suggesting that the comparison of "new" versus "traditional" approaches perhaps is becoming less relevant.

As suggested by our review, a more promising distinction is perhaps between teacher-centered and student-centered pedagogical approaches, and that it is important to take into account that students often are enrolled in a distinct study program that consists of a combination of teaching and learning

activities that can be more characterized by hybridity than consistency. No approach is purely successful on its own. Opportunities and challenges are associated with all pedagogical formats, and all can be both advantageous and disadvantageous for student learning, depending on the relationships of the activity in students' wider learning context. Hence, a main issue for program quality is to secure productive relations between different activities and sites for learning in the program/course, and to use different pedagogical approaches strategically to achieve the overall aims of the program.

In sum, we find that we know quite a lot about what matters for quality in different types of activities, and about the general principles for organizing teaching and supporting learning. What we do not know much about, however, is how activities play out in the specific contexts of educational programs and courses, or what challenges teachers and students experience in this regard. Few studies exist that look into the educational processes as they unfold, and even less so in the Norwegian context. Moreover, while domain-specific differences generally are acknowledged, few studies have explored such differences in educational practices and what they imply for teaching and learning. More knowledge about these issues is important also to understand the relationship between generic and specific competencies, and how generic skills can be developed in domain-specific activities. We thus suggest that future research should address teaching and learning in different pedagogical formats more systematically, both as stand-alone activities and with an eye to how they can be fruitfully combined in programs and courses. Moreover, these issues should be explored across a variety of knowledge domains.

### **4.3 Quality work as interlinking micro, meso and macro perspectives**

This literature review is a novelty in that it attempts to bring together different research strands and traditions: on the one hand, studies on policy reforms, their implementation and effects; and on the other, studies on learning and teaching in higher education. While the first set of literature is often rooted in public administration and organizational studies, the second is more related to psychology, pedagogy and didactics. By bringing the literature together we underline what we see as an important and much needed development in the research on higher education – the need to link micro, meso and macro perspectives in research on higher education.

Our knowledge of what constitutes quality in higher education is in general packed with findings where we struggle to explain the mechanisms driving particular outcomes. As such, we would argue for more studies on “quality work” – what we would define as analysis of the linkages between external and structural framework conditions, how universities and colleges govern their educational responsibilities, and quality enhancement at micro level. While such knowledge is highly theoretically interesting, it could also provide policymakers with new insights on where public money is spent most effectively.

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