

Teaching Portfolio

Jon Iden (jon.iden@nhh.no)

Professor in Information Systems, Norwegian School of Economics, Department of Strategy and Management

Part 1: Biography

Educational Qualifications

Institution	Period	Degree	Subjects
University of Bergen	1991–1995	PhD (dr. polit)	Information Science
	1989–1990	Master (Hovedfag)	Information Science
	1979–1984	Bachelor (cand. Mag.)	Information Science, Geography, Administration and Organization Science

Table 1: Educational qualifications

Employment Record

Institution	Period	Position
NHH – Norwegian School of Economics	2007–date	Professor
NLA University College	2014–2018	Adjunct Professor
University of Bergen	2004–2007	Associate Professor
Institutt for prosessutvikling og arbeidsflyt AS	1998–2004	Manager, consultant, lecturer
Bergen Data Consulting AS	1995–1998	Consultant
University of Bergen	1991–1995	Assistant Professor, PhD student
Den norske Bank, Bergen Bank, Integrert Databehandling	1984–1991	Manager, project manager, systems programmer
Gimle videregående skole	1983–1984	Teacher

Table 2: Employment record

Teaching experience

I started my teaching career as a part-time high school teacher in 1983. As a PhD student at UiB (1991–1995), I was responsible for teaching one bachelor course each semester, in addition to supervising bachelor and master students. Between 1995 and 2004, while working professionally in the IT industry, I taught courses at UiB and NHH as an adjunct professor and through my own consultancy, where I developed courses for professionals. Since my work at the NHH began in 2007, I have taught different courses, some of which I have taken the initiative to develop. In addition, I held an adjunct professor position at NLA University College, where I developed and taught a bachelor course. I have also engaged myself as a teacher for the NHH Executive, and I give guest lectures at various Norwegian universities and colleges. Over the years, I have gained extensive experience as a supervisor at all levels. The following tables provide an overview of the academic courses I have lectured on and the institutions with which I have worked.

Course	Years	Responsibilities	Enrollments	Teaching and assessment approaches
SOL316 Prosessutvikling med IT (Master)	1999–2001	Course Responsible. All teaching. Hired as an adjunct professor for this course	200	Lectures, school exam
Met030 Databehandling for økonomer (Bachelor)	2008, 2009, 2011, 2012	Course Responsible. Most teaching	450	Lectures, exercises, digital tools, individual home exam
STR443 Process Modeling and Analysis (Master)	2008–2010	Course Responsible. All teaching	16, 18, 19	Lectures, exercises, digital tools, school exam
SOL11 Prosjektledelse (VOA026 IT prosjektledelse) (Bachelor)	2009–2018, 2022	Redesigned course. First: course responsible. All teaching. Now: co-responsible and co-teaching	Increased from 12 to 440 students	Lectures, exercises, home group project and oral exam in groups. Official certification
STR446 Prosessledelse (Master)	2012–2017, 2024	First: course responsibility: all teaching. Now: co-responsible and co-teaching	Increased from 15 to 130 students	Lectures, individual exercises, workshops, home group project and oral exam in groups
STR453 Digitalisering (Master)	2017–2019, 2021, 2022	First: course responsible: all teaching. Now: co-responsible and co-teaching	Access restricted to 80. Fully subscribed	Lectures, workshops, digital tools, home group project
STR462 Anvendt digitalisering (Master)	2021–2022	Co-responsible and co-teaching	Access restricted to 45 students. 34 students first year	Lectures, seminars, exercises, digital tools/labs, workshops, home group project
ORG520 Foundations and Frontiers of Management (PhD)	2021	PhD course. Responsible for one-day lecture on 'digitalization and strategy'	12	Lecture, discussions, home exam
NHH Executive - Digitaliseringsledelse	2021–2025	First: Program Responsible. Now: Co-teaching	30	Lectures, exercises, discussions, individual home project
NHH Executive – Prosessledelse	2022–2025	First: Program Responsible. Now: Co-teaching	30	Lectures, exercises, discussions, individual home project

Table 3: Overview of courses taught at NHH

Course	Years	Responsibilities	Enrollments	Teaching and assessment approaches
I.24 Computer Architecture and Operation Systems	1991–1994, 1996	Course responsible. All teaching	30	Lectures, school exam
I.34 Computer Networks and Telecommunication	1992–1993, 1996	Course responsible. All teaching	30	Lectures, school exam

INFO317 IT Service Management (Master)	2005–2006	Course responsible. All teaching	25	Lectures, seminars, exercises, labs, workshops, home group project
INFO211 Information Systems	2004–2007	Course Responsible. All teaching	50	Lectures, school exam
NLA - Information Systems	2014–2018	Course Responsible. All teaching	40	Lectures, exercises, workshops, home group project

Table 4: Overview of courses taught at UiB and NLA University College

Institution	Course	Years	Topic	Invited by
University of Bergen	Information Systems	2008, 2009, 2013	IT Service Management	Professor Bjørnar Tessem
University of Oslo	IT and Management	2021–2022	Process Modelling	Professor Bendik Bygstad
Nord University	Business Architecture	2013–2014	Process Management. Process Modelling	Associate Professor Terje Fallmyr
Western Norway University of Applied Sciences	Information Management	2008–2013	Process Management, Process Modelling	Associate Professor Tarjei Heggernes.
The Arctic University of Norway	Information Systems	2007–2008	IT Service Management	Associate Professor John Dalseng

Table 5: Overview of guest lectures at other institutions

Course	Years	Teaching and assessment approaches	Examples of participants
Prosessutvikling med RIS	2003–2005	Lectures. Individual tasks, group tasks. No exam	BKK, Departementenes servicesenter, DFØ, Halliburton, Sparebanken Vest, Trondheim kommune
Information Technology Infrastructure Library	2003–2006	Lectures. Individual tasks, group tasks. Official certification	DnB, Evry, Helse Vest IKT, Jernbaneverket, NSB, NTNU, Posten, Telenor, UiB

Table 6: Courses developed and taught through my own consultancy

Pedagogical qualifications

NHH-PED3: Course in Pedagogy – Elective Module: Teaching Portfolio. Spring 2021. Led by Robert Gray Jr. and Marie Annette van der Kloet.

NHH seminars in online teaching, fall 2020. Led by various internal and external resources.

Participated at seminars in “Pedagogisk uke” in uke 39 in 2014, held by Torben K. Jensen, Aarhus University.

UiB: University Pedagogy, 1992–1993. Led by Professor Kjell Raaheim and lecturer Arild Gulbrandsen.

IDA AS: Presentation Techniques and Skills, 1985. Led by internal resources.

Teaching awards

During my years in academia, I have received several awards for my teaching excellence.

In 1992 and 1993, as a PhD student at the University of Bergen, I won the students' '**best teacher award**' at the Department of Information Science for the courses I.24 Computer Architecture and Operating Systems and I.34 Computer Networks and Telecommunication.

At UiB, in 2006, I won the students' '**best master course award**' at the Department of Information and Media Science, for the course Strategisk ledelse av IT-tjenester (IT Service Management).

At NHH, in 2012, I won the '**Teaching Prize**' (**Undervisningsprisen**) at the Department of Strategy and Management for the course SOL11 Prosjektledelse.

In 2015, my course STR446 Prosessledelse was awarded one of **NHH's best practice courses** by NHH's Academic Committee.

In 2016, I won the NHH students' '**Bronze sponge**' (**Bronsesvampen**) for the course SOL11 Prosjektledelse, which is extraordinary for an elective course.

In 2022, I was honored with the status **Excellent Teaching Practitioner**.

Part 2: Teaching philosophy

I have been a university teacher since the 1990s. Over the years, based on my own experience, student feedback, and my pedagogical training, my teaching philosophy has developed around the principles of *active learning*, e.g., reading, writing, discussing, and solving problems based on the intended learning outcomes (Bonwell & Eison, 1991). I view active learning as an umbrella that covers a set of mutually related learning approaches in which *problem-based learning* and *collaborative learning* are critical for engaging students in the learning process. I apply 'kvalifikasjonsrammeverket for høyere utdanning', authorized by the Norwegian government (2004), to specify learning outcomes, topics, activities, and assessment methods. These are introduced to the students at the beginning of the course, together with the problems they will be required to work on, in order to provide the context for their learning (Prince, 2004). Normally, I combine formative and summative assessment in my courses.

Problem-based learning implies that students should work on solving problems that engage them in the core aspects of the subject during the semester. This means that the teacher should facilitate the students' application of theory and knowledge in solving problems, individually or in groups, rather than only provide knowledge (Hmelo-Silver, 2004). Therefore, I am mindful about using the lectures not only to teach new topics but also to engage the students in the subject, including through their own individual activities, whether it be reading or exercises. To this end, I use a variety of tactics. For each lecture, I first tell them what to read and how to prepare. I give them exercises to work on individually at home and produce videos to support their learning. Research has shown that problem solving positively influences students' skill development, although its effect on knowledge creation is more ambiguous (e.g., Dochy et al., 2003). I also find this approach valuable for establishing good relations with my students by engaging in their activities. An aspect of problem-based learning is *learning by doing* (Schank et al., 1999), which I deem a very valuable concept to incorporate in students' learning. In my courses, I include many practical tasks, both for the students individually and in groups, in order to engage them in working on practical problems and producing artifacts such as models or digital solutions. I believe that social science students should be given the opportunity to design or develop 'something'. Consequently, in my master courses and master thesis counseling, I introduce them to design science research, a research methodology focusing on the design and development of an artifact, and encourage those who are interested to apply this approach and methodology in their own work. This has, for example, resulted in students building software apps and robots, chatbots,

modeling tools, and solutions based on beacon technology. In one course, I partnered with Helse Vest IKT's innovation lab, to enable students to create novel solutions for health care. Some of these student projects have been part of master courses, while others have constituted the students' master theses. The student evaluations show that they highly appreciate this opportunity. Some report that they welcome the chance to work hands-on in this way since so much of university study involves reading the course literature. I have presented (with the students' permission) some of the artifacts they have developed for businesspeople, for example at courses for the NHH Executive, and the audiences have been greatly impressed by what the students have accomplished.

Collaborative learning is a process whereby students learn and develop together with their peers and the teacher, through interaction, dialogue, and feedback (Prince, 2004). I believe that this dynamic approach, which involves classroom discussions with other students and active Q&As with the teacher, enhances students' growth and learning outcomes (Johnson et al., 1991). Student projects are also an excellent means for collaborative learning, as working on a project involves a longitudinal learning process wherein the students, through joint problem analysis, experimentation, interactions, and dialogue learn and solve problems together towards a common goal (Gokhale, 1995). Collaborative learning is associated with social, psychological, and academic benefits (Laal & Ghodsi, 2011). For example, it helps in developing a learning community, has been found to reduce anxiety, and promotes knowledge development and critical thinking skills. Moreover, in collaborative learning, the success of one student helps other students to be successful (Gokhale, 1995). For me, learning should not be a solitary activity.

Feedback through dialogue (Metcalfe & Game, 2008) is another principle central to my teaching philosophy. I believe in making myself available to my students such that they can always contact me to discuss their work during the course. I make a point of arriving at the lecture hall early, so that students can talk with me before the lecture starts, and I make myself available to them during the break, as well as after class. I also respond to their e-mails as promptly as I can, and if they wish, I meet with them in a meeting room or at the cafeteria. During the Covid-19 pandemic, I have been especially conscious about being available, and I often set up Teams or Zoom meetings with them. From the student evaluations, I have found that students greatly appreciate the opportunity to talk with me outside the lecture room. I also apply digital tools to encourage student feedback and dialogue. For example, when teaching digitally in Zoom, I use Curipod, which allows the students to submit questions that I answer either in the class or afterwards. The Q&As are thereafter put on Canvas, which is available to the whole class.

In addition, I believe that teaching at universities and business schools should be *research-based* and that the teacher should be an active researcher in the subject area they teach. As such, I value and excel in developing and organizing courses within my own research areas. Moreover, I actively use my own research and publications in the syllabus and as examples in my teaching. I find that this approach allows the students to make connections to the discipline that might not otherwise be possible, and it enhances my opportunity to support student learning as a result of my own expertise in the field. I also value *research-based learning* and collaborate with students on their own research projects, which has led to several publications in academic journals and practitioner outlets, at conferences and in public media.

More generally, my teaching philosophy is grounded in the belief that all students can succeed if they believe in themselves, and if they are treated as if they will succeed (Boud, 2000) and adequately motivated (Xie & Reider, 2014). Moreover, students must be conscious of their own learning processes and realize that they are ultimately responsible for their own learning, so that they can become self-directed learners (Rashid & Ashar, 2016). Every year, the students and courses are different, as new

students bring with them a new learning context. I therefore work to adapt my courses to the particular student group, seeking to connect new information to the information they already possess. I believe that learning is best promoted when existing knowledge is activated as a foundation for new knowledge (Merill, 2002). I also believe that as a university teacher, I should prepare them for long-life learning (Weise, 2020), which means that my role is also about encouraging students to learn those values, qualities, and attributes that will carry them successfully through life.

In the next two parts of my teaching portfolio, I will account for my teaching philosophy in more depth.

Part 3: Teaching and assessment repertoire

For the last 15 years, longitudinal home projects carried out in groups of three, presented in a project report in combination with an oral exam, have been my favorite learning and assessment methods. In the following, I will describe my preferred repertoire more explicitly. I will treat learning and assessment as one since I consider them to be highly related. My choice of teaching and assessment methods are consciously aligned with the stated learning outcomes. For example, in STR462, Anvendt Digitalisering, one major learning outcome (skills) is that *the student should be able to use digital tools, and related methods and techniques, to solve a concrete customer problem*. To that end, students learn how to conduct a system engineering project (e.g., Scrum), to model an information system (e.g., use cases and system architectures), and to develop an information system (e.g., low-code programming) through class teaching and workshops facilitated by student assistants (learning by doing and collaborative learning). To further develop their skills and assess their achievements, we give them a real-world problem to solve (problem-based learning) and ask them to report their results in a project report that is assessed and graded (assessment aligns with learning outcomes).

Over the years, my teaching has gradually developed from one-way lectures and school exams to a teaching and assessment repertoire based on what I consider active learning. As I believe strongly in learning by doing and collaborative learning, whenever possible I include a practical component in my courses, including in individual exercises and group projects. Although the courses are all different, my basic principles are as follows. In the first part of the course, the students work on solving a set of exercises individually. In courses where the students are required to hand in their exercises, we have a one-on-one dialogue about their answers. In large classes, I use digital tools (e.g., LMS, Curipod, e-mail) for this purpose, and in smaller classes, these discussions take place orally, or sometimes in combination. The reason I ask them to work on these exercises individually first is that I want each student to learn, develop, and succeed in such a way as to ensure that they are well prepared for the subsequent group project. Thereafter, the students work on a self-selected group project (problem-based learning) based on the theories and methodologies they have been learning in their individual exercises. The students are free to organize their project however they prefer. The projects are comprehensive, which means that all group members are required to actively engage themselves and collaborate to complete the task successfully. I chose this method for three reasons. First, it is well known that students learn from each other (Gaffney et al., 2008). Second, it gives them the opportunity to work on their collaboration and communication skills, which are highly valued in today's society. Third, as in several courses I want the students to work on real problems in real companies, being part of a group gives them some comfort. I always provide the groups with counselling individually and dialogue with them during their learning process.

In the following, I will provide two examples from SOL11 Prosjektleidelse and STR446 Prosessledelse, respectively, to illustrate my approach to problem-based collaborative learning more specifically.

In SOL11 Prosjektleidelse (bachelor), I design a major task, for example an event (such as a festival), that I want the student groups to organize as a project. This involves them in writing the project mandate, designing the project organization, developing the project plan, doing a risk assessment, etc., and finally writing the project evaluation report. For these tasks, I have developed a methodology and series of templates for them to use. The opportunity to organize and conduct a real project based on a real-world problem in a process supported by real-world methodology is greatly appreciated by the students, and their results (project reports) exhibit a remarkably high standard. As one of the students commented in the evaluation report (2016): “I learned a lot by working on the home exam. We were given the opportunity to put theory into practice and think carefully through different aspects.”

In STR446 Prosessledelse, I ask the students to connect and collaborate with an actual company and find a real business process they can work with. This project requires them to describe the existing process (as is), analyze it to find shortcomings or opportunities for improvement, and design a new business process for the company. For these tasks, I have developed a series of templates for them to use. I have also developed a modeling technique and a modeling tool that the students can apply in making graphical models of the business processes. I have been very pleased to hear that many firms find the student suggestions valuable enough that they implement them in their own operations. After completion, the students present their projects to each other, initially as presentations in the auditorium, and recently, as the classes have become larger, as poster presentations, to which I invite faculty to attend. The ability to present key topics and their own work both in text and orally is stated as a learning goal in the course description.

As mentioned, I have learned from the student evaluations that the students value the opportunity to work on practical assignments. As one student in STR462 Anvendt Digitalisering commented: “Apart from being educational and fun, it makes my study life more varied as most of the courses at NHH require you to just read textbooks and articles.” The opportunity the students have to work with companies on a real-life business problem is especially appreciated.

In addition to the group project, I utilize the oral exam as an assessment method. While the group project focuses on mastering the subject’s practical component, the oral exam focuses on the more theoretical parts of the subject. Before this exam, I give the students a set of problems and questions I want them to work on as their preparation. I find the combination of the practical project and the oral exam very effective as an assessment approach. I am also very pleased to know that the students value the opportunity to participate in an oral exam. Because of the Covid-19 pandemic, I have been forced to temporarily stop using the oral exam, but I will resume this practice again when time allows.

Part 4: Supervision

I have experience with supervision at all levels: bachelor, master, and PhD, at UiB, NLA, and NHH. In total, I have supervised more than 80 bachelor’s theses at UiB and NLA. For master’s theses, I have supervised a total of 75, 20 at UiB and 55 at NHH. I have never experienced that any of my master’s students have failed to complete their master’s theses. As for PhD theses, I have supervised three PhD students at NHH, all of whom successfully defended their PhD dissertations (2019, 2021 and 2024). I was the co-supervisor for one PhD student at Nord University, who successfully defended her dissertation in 2019.

My guiding principle in supervision is that structure and continuous dialogue are important. My students’ process and our collaboration should be well organized, and we should communicate regularly. Of course, supervising a master student is quite different from supervising a PhD student, although the core principles are common: helping them structure the manuscript, identify a knowledge

gap and formulate a research question, find and organize the relevant literature, decide on and employ an applicable research method, analyze the data, present their findings in a suitable manner, discuss the consequences of their findings, and conclude with the research contributions.

In supervising master's theses, I typically meet with the students the preceding semester to decide on a plan for their research process and our collaboration. After the meeting, I prepare and circulate a work plan and a time schedule for the coming semester. I encourage the master's students to work on their theses in a structured way, from the introduction to the conclusion, covering one new chapter in each meeting during the semester. I prioritize giving detailed written and oral feedback on their written drafts. I ask that the students send me their chapter drafts in sufficient time before each meeting. I insert my comments directly in the draft, and then return it, so that we can use the following meeting to discuss the next step (and the next chapter) in their research process. I also regularly discuss their project with them outside our scheduled meetings. The master's students tell me they greatly appreciate this approach, especially since they are not left with writing the whole master's thesis during a few hectic weeks near the deadline.

When counseling PhD students, I also emphasize structure and continuous dialogue. However, as this is a four-year research project, we must improvise according to the student's research project, as well as their personalities and individual needs. Roughly, we follow this plan: a) decide on the topic (area of concern, problem statement, and potential contribution); b) conduct a comprehensive (systematic) literature review; c) determine a case organization for the data collection; d) write a first paper together; e) connect the student to international senior scholars for their next papers; and d) assist the student in writing the 'kappa'. For our junior scholars, I emphasize introducing them to the academic culture, helping them build their academic network, and including them in various academic tasks, e.g., teaching, censoring, counseling, and dissemination (media contribution).

When working together with the PhD students on research articles, I first ask them to write an initial draft of the article based on our data collection. I then read the article and insert comments directly in the document, which are related to a variety of issues, e.g., structure and writing style, research motivation and question, findings, discussion, and conclusion. Thereafter, we discuss my comments together in a workshop and prepare for a new version by the PhD student. My idea is that by following this process, the PhD student will gradually learn to master the ability and skills involved in writing a publishable paper. As such, my idea of supervising PhD students is much like the relationship of master and apprentice, although I acknowledge that this approach is debatable (Harrison & Grant, 2015). As a master, I develop the apprentice (the PhD student), and the PhD student learns from me, the master. I want the student, through her research project and our collaboration, to achieve the knowledge and skills of the master. I find this way of thinking beneficial in terms of both the PhD student's development and our relationship-building.

Overall, I find that my students at all levels appreciate structure and continuous dialogue, and especially the opportunity to discuss the plan and schedule with me at the beginning of and during our joint process.

Part 5: Pedagogical materials

As explained above, I emphasize the principles of active learning and learning by doing. This may be difficult to realize, however, when using a traditional textbook or set of academic articles as the syllabus. Therefore, I have found it necessary to develop a variety of pedagogical materials for the courses I teach to support the principle of learning by doing. The following are some examples.

University of Bergen

At UiB, and for the master course I established in 2006 on IT Service Management, I developed, with funding from two industry partners, a unique PC-lab of 10 computers in a network with software and digital tools specialized for this subject area. I developed this PC-lab to give the students the opportunity to run a software engineering project and to develop a digital solution as part of their bachelor's thesis. The PC-lab was a success, as indicated by the students' comments in their evaluations: "This is the most useful course I have had at UiB (Student A) and "a concrete and relevant course with a challenging and stimulating project" (Student B.). This course won the students' 'best master course award' in the Department of Information and Media Science that year.

At NHH

In 2009, I launched the new course STR443 Process Modeling and Analysis, for which I developed a modeling technique and a modeling tool for process modeling, as well as a method for process redesign. To support the international students following the course, I translated my book '*Prosessutvikling. Håndbok i modellering og analyse av prosesser*' into English (Iden, 2009).

In 2013, I launched the new course STR446 Prosessledelse. I wrote a new textbook for this course entitled *Prosessledelse*, which I revised in 2018. From an earlier course (SOL316 Prosessutvikling med IT), I realized that a syllabus based only on international articles, often rooted in the Anglo-Saxon business culture, is not always applicable and transferable to the Norwegian business culture. 'Prosessledelse' is the only textbook on this subject in Norwegian. To support the practical component of the course, I developed a methodology, including various templates and tools based on MS-Visio.

In 2010, I launched the new course SOL11 Prosjektledelse. Here too, I developed a methodology for the practical part of the course, including various templates and tools.

For the master course STR453 Digitalisering, which I established in 2017, I developed various 'computer-labs' for student projects in collaboration with industry partners, such as a cloud-based lab for developing RPA solutions (robotic process automation) and a cloud-based lab for developing Beacon solutions. My motive for developing these labs was to give the students hands-on experience in developing digital solutions. This opportunity has been greatly welcomed by the students.

For the master course STR462 Anvendt digitalization, we developed a cloud-based software development environment in collaboration with an industry partner, which enabled the students to develop software apps.

At IPA AS

During the years I ran my own consultancy, I developed two two-day courses for my business clients: 1) Prosessutvikling med RIS and 2) Information Technology Infrastructure Library. In addition to creating the entire teaching material, I developed methodologies with techniques and tools for the two courses' practical components. Their development was supported by the Norwegian Skattefunn schema. I have shared this methodology with more than 100 companies, both private and public, and it has gained popularity in the business community.

Part 6: Teaching planning and contributions

Development of new courses

In part 1, Biography, I provided a full overview of the courses I have taught during my career, many of which I developed more and less from scratch (See Table 7).

NHH	UiB	NLA	NHH Executive	IPA AS
STR443 Process Modeling and Analysis (Master, 2008) STR446 Prosessledelse (Master, 2012) SOL11 Prosjektledelse (Bachelor, 2010) STR453 Digitalisering (Master, 2017) STR462 Anvendt digitalisering (Master, 2021)	INFO317 IT Service Management (Master, 2005)	Information Systems (Bachelor, 2014)	Prosessledelse i praksis (short program) Digitalisering (short program) Digitaliseringsledelse (executive master i ledelse) Prosessledelse (executive master i ledelse) Digital transformasjon (open online course)	IT Service Management and IT Infrastructure Library (2002) Prosessutvikling med RIS (2002)

Table 7: Overview of new courses that I have developed for various institutions

Contributions to others

In addition to my own courses, I have collaborated in the development of other courses at NHH and elsewhere. At NHH, I took over the course responsibility for Met030 Databehandling for økonomer between 2009 and 2012, as the person normally responsible for the course was on sabbatical and maternity leave. For several years, I contributed to STR442 Enterprise Systems, with lectures and educational material. There is one course in our department, STR459 Kunstig intelligens og robotisering, for which we use an external adjunct professor. I involved myself substantially in this course from the beginning, contributed to the course description, the assessments, the course plan and schedule, the hiring of teaching assistants, etc., as well as coordinating internally at NHH.

Several of my courses and pedagogical materials have proven valuable in different contexts at NHH. For example, based on the course STR446 Prosessledelse, I have taught process management and involved myself in internal process improvement projects at NHH, such as the initial implementation of Wiseflow and the current Digital Prosessforbedring program. The latter currently makes use of the pedagogical material I have developed. Based on the course SOL11 Prosjektledelse, I have arranged workshops on project management at NHH, and based on the course STR453 Digitalisering, I have held three open courses for NHH staff in which my pedagogical material was utilized.

On a regular basis, I give lectures at other institutions, such as UiB, UiO, UiA, and others. I also arrange courses and seminars through the NHH Executive, and I still offer seminars and courses to private and public organizations through my own consultancy.

Part 7: Education leadership and management

Between 2009 and 2013, I acted as the teaching coordinator and a member at the management team at the Department of Strategy and Management at NHH. My key tasks as a teaching coordinator were to nominate supervisors to master's theses, organize teaching quality assessments, and coordinate censors for our exams.

A major project we undertook at that time was to improve the totality of the department's mandatory bachelor courses and particularly the thematic relationships between them, which was at that time rated as low by the students. To this end, I conducted several workshops with my colleagues in which we discussed course content, syllabus, and assessment methods. We also involved student representatives in the process. Based on this work, we redesigned the internal structure of our bachelor courses. According to the students' subsequent evaluations, we succeeded.

During my period as teaching coordinator, I initiated the 'pedagogical workshop' (pedagogisk verksted) in 2011, a seminar series where the teachers at SOL came together to discuss pedagogical issues and challenges. In the workshops, various SOL teachers presented their initiatives and experiences, as well as challenges, in exploring and utilizing new teaching and assessment methods, such as flipped classrooms, case-based teaching, and videos. We also discussed our process and experiences in supervising master's theses, and we created a webpage for master's theses topics. The pedagogical workshop initiative was greatly appreciated by my colleagues, and the idea was later introduced for NHH as a whole. During the time I was teaching coordinator, our department had several young scholars (e.g., PhD students) with little teaching experience. In this role, I engaged myself in their practices and situations, and I bought a set of the book, 'Håndbok for ferske forelesere' (Risan et al., 2009), which I gave them for inspiration and guidance.

In 2009 I was part of NHH's work group for developing guidelines for a language policy at NHH, including education, and in 2015 I was part of NHH's committee for evaluating internships as part of the master program. In 2011 I acted as a supervisory censor for NITH's master program on IT Governance.

For the last five years, I have voluntarily stepped up as the coordinator for the department's digitalization and digitalization-related courses. In addition to nominating and organizing internal resources for the courses and master's theses, I also handle the recruitment of adjunct teachers. More recently, I took on the role of teaching mentor for a post doc at the Department of Strategy and Management, which was accomplished successfully in February 2022.

Part 8: Evidence of student learning

What counts as evidence of student learning is contested, and I agree with those who claim that universities are information rich, but evidence poor. Although I find positive students' evaluations and teaching awards encouraging, in my view, it is the censor's evaluation of students' answers to the exam in light of the stated learning outcomes that I find most relevant. My discussions with student focus groups at the end of the semester are also a valuable source in this respect.

Comments from the external censors

One key evidence for me of student learning are the comments I regularly receive from the external censors. Professors who regularly censor my students' assessments frequently start our meetings by commenting on the high standard of the students' answers.

Grades

As a censor, I see that the students learn a lot from my courses, as evident from the grading. It is a pleasure to read the students' answers. I am normally impressed by what they have learned, especially by how they are able to apply theoretical concepts, techniques, and tools in the courses' problem-oriented tasks.

Students' evaluations

I consistently receive high ratings from the students for my courses. I also receive many positive comments from them related to the learning outcomes. Some examples follow:

- “This is the most useful course I have taken at UiB. This course MUST be repeated. Jon Iden is a very good lecturer” (INFO317: Strategisk forvaltning av IT-tjenester, 2006).
- “Concrete and relevant course taught with enthusiasm and spirit by a committed and professionally skilled lecturer. Challenging and rewarding semester assignment. Already have a job offer on the basis of the course and subsequent certification. This course is the best I have taken at Infomedia” (student is in the 4th semester) (INFO317: Strategisk forvaltning av IT-tjenester, 2006).
- “I learned a lot by working on the home exam. We had to put theory into practice and think carefully through different aspects. The lectures and the textbook served as a very good basis for answering the assignment” (SOL11 Prosjektledelse, 2016).
- “The lectures were very good. Liked how they varied from theoretical to practical. The exercises meant that you had to think for yourself how to apply the theory and made learning outcomes greater in this subject than in very many other subjects that become too theoretical. The pace and communication have been very good. The fact that you walk around a bit and talk to the students during the exercises worked well and ensures that you take the time to think through the assignment” (SOL11 Prosjektledelse, 2016).
- “Jon is a good lecturer, and writing for business was very fun, so you could see how the knowledge can be used in reality” (STR446 Prosessledelse, 2021).
- “The combination of practice and theory – it is one of the best courses I have taken at NHH. Feel it is much more relevant to working life than other courses. This is something I will get a lot of use from when I go to work this autumn” (STR462 Anvendt Digitalisering, 2021).

Official certification

For three of my courses, I collaborate(ed) with accredited certification bodies to confirm learning outcomes: SOL11 Prosjektledelse, INFO317 Strategisk forvaltning av IT-tjenester, and Information Technology Infrastructure Library, all voluntary courses. The students in SOL11 Prosjektledelse, for example, are offered, in collaboration with Metier AS and Alexos Ltd, to take the PRINCE2® foundation exam. In 2021, 150 students chose this option, and almost 100% passed.

Part 9: Dissemination

Some of the materials I have developed have been applied by other institutions. The most important examples are:

My two textbooks, *Prosessledelse* (2018) and *Prosessutvikling. Håndbok i modellering og analyse av prosesser* are (have been) used at the University of Oslo, the University of Agder, Western Norway University of Applied Science, Nord University, Nord Business School, the Arctic University of Norway, Alta, and NLA University College.

The methodology I developed for the course STR446 Prosessledelse is being used by teachers at the University of Oslo and the University of Agder.

A number of student exercises I developed for the course STR446 Prosessledelse are being used by teachers at the University of Oslo and the University of Agder.

As mentioned in part 5, Pedagogical materials, my books, methodologies, and exercises are being used at NHH and also by numerous organizations, both private and public.

In addition to academia, I have held numerous courses for private and public companies, such as Aibel, Atea, Avenir, Bankenes Betalingssentral, Bergen Group, Bertil O. Steen, BKK, BKK Nett, Den norske Bank, Departementenes Servicesenter, Direktoratet for internasjonalisering og kvalitetsutvikling i høyere utdanning, Direktoratet for samfunnssikkerhet og beredskap, Direktoratet for økonomistyring,

Ergo Group, Evry, Fiskeridirektoratet, Gjensidige, Halliburton, Havforskningsinstituttet, Helse Vest, Helse Vestre Viken, Loisenberg Diakonale Høgskole, NAV, Nordea, Nordpool, North Sea Group, Olje og energidepartementet, Oljedirektoratet, Petroleumstilsynet, Politidirektoratet, Qualisoft, Sjøfartsdirektoratet, Skatteetaten, Sparebanken Vest, Statnett, Sykehusapotekene, Telenor, Tolletaten, Trondheim kommune, Tryg Forsikring, TV2, and Universitetet i Bergen.

Part 10: Reflections on educational development

Reflecting on my path, I believe my teaching philosophy started to develop when, as a teenager, I worked as a leader of youngsters at the YMCA and as a trainer for a football team. Later, as a student, I took a part-time job as a teaching assistant for children with disabilities and at a high school, where I taught computer science and accounting. My industry practice after graduation with a master's degree from the University of Bergen has also undoubtedly influenced me, first as a manager in various departments, and even more relevant, as a business consultant, where I frequently arranged courses and held presentations for business clients.

As a PhD student at the University of Bergen, I took a course — over two semesters, including two double-day seminars — called University Pedagogy, led by Professor Kjell Raaheim and lecturer Arild Gulbrandsen, which was truly inspiring. Key activities in this course were to invite other course participants to my lectures and to follow the lectures held by others, with debriefings afterward. This experience was demanding, but very educational. A central takeaway was that I, as a new university teacher, was too focused on lecturing and not sufficiently focused on dialogue and activating the students in my classes. Increasingly, I developed the pedagogical approach of inviting students into a conversation with me and their classmates, giving them small tasks or problems to work on and discuss, both among each other and with me, as feedback. In this pedagogy course, I was introduced to mind maps (Ringom, 2013), which I found more suitable for dialogue-oriented lectures than traditional PowerPoint slides. Instead of compiling a set of slides that are often cramped with text, I developed one or two mind maps for each lecture, which guided me through the topics and enabled me to focus more on the students and our dialogue than on the teaching material.

Inspired by the University Pedagogy course, I read books about rhetoric (e.g., Hägg, 1998), which influenced the way I structure my lectures, especially in terms of applying rhetoric principles to capture the interest of the audience early on (exordium). Another topic I have found valuable in understanding the relationship between student and teacher is Shannon's communication and information theory (e.g., Shannon, 1949), which considers the two-way communication challenges between sender and receiver (i.e., separating the medium from the message). In other words, it is not what I, the teacher, intend to say that matters, but what the students hear, as well as how my teaching connects to the students' existing knowledge and understanding (Merill, 2002). I believe that good communicators are those who understand the underlying principles behind communication and are able to enact, appropriately and effectively, the particular communication skills the situation warrants.

I have also learned a great deal from the students' course evaluations and feedback (Biggs & Tang, 2011; Carless & Boud, 2018). I regularly analyze the course evaluations and use their input and recommendations to develop my courses further. I also arrange focus groups and discuss with students individually in order to get their direct feedback on my teaching, especially for new courses. I can give two examples in which feedback from the students was especially valuable. In 2010, I was concerned about the low number of students enrolled in the course VOA026 IT Prosjektledelse, as fewer than 10 students were following my lectures. In discussions with the students, individually and in focus groups, I understood that the course was too IT-oriented and that the students needed a more general course on project management. Consequently, I redesigned the course, including its content, learning

outcomes, and assessment methods, and changed the title to Prosjektleidelse. The results speak for themselves. Today, this is one of the most popular bachelor courses at NHH (440 students enrolled in spring 2022). In 2012, I won the Department of Strategy and Management's 'Teaching Prize', and in 2016, I received the 'bronsesvampen' (the bronze sponge) for the course. The other example is more recent. In the fall of 2021, we held the course STR462 Anvendt Digitalisering for the first time. In December, after the students had completed their assignments, we arranged a focus group with them in order to receive their feedback. Among other things, we learned that we need to provide the students with more practical training in the software early on. As a result, we are now redesigning the course based on the students' feedback.

Over the years, I have increasingly come to value teaching in partnership. While in my earlier days, I had sole responsibility for my courses, I now always collaborate with my colleagues. I find this valuable in all phases of course development and delivery, from course planning and teaching to censoring and course evaluation, all organized as a joint venture with a great deal of dialogue and exchange of experiences as to how student learning can best be supported. Collaboration is also much more fun than working completely on my own.

As an academic, I constantly develop through my research and teaching. Over the years and through my experiments with alternative teaching and assessment methods, as well as the feedback from students' evaluations, I have become more confident about which of my practices best promote students' learning. However, as new pedagogical approaches evolve, together with the development of digital learning tools, I continuously evaluate my teaching philosophy and practices. To learn from international and national colleagues, I attend, whenever possible, the pedagogical session track at relevant conferences, such as the International Conference on Information Systems (ICIS), the European Conference on Information Systems (ECIS), and the Norwegian Information Technology Conference (NIKT). Learning from others has inspired me to develop new courses, try out innovative teaching practices, and include new teaching material in my courses. A recent example is when we were developing the new course STR462 Anvendt Digitalisering, and I consulted a pedagogical paper (Kabza et al., 2020) for advice on how to teach modeling in software engineering.

Over the last 30 years, my teaching has developed from traditional one-way classroom teaching to an active learning approach based on problem solving, which includes exercises, longitudinal group projects, feedback, and dialogue. But what will the future hold? The Covid-19 pandemic has showed us that as teachers, we must constantly adapt to new situations and adopt new practices. Although I have experimented with recording my lectures since 1993, the level of virtuality that we have employed the last two years has been an entirely new experience and a challenge. Although neither the students nor myself are particularly enthusiastic about breakout rooms, I find webinars, Zoom lectures, and short demonstration videos, as well as supervising students on Teams, effective and efficient. I have evaluated the grading results for the last two years, and they show no indication that virtuality has reduced learning outcomes. This is in line with the results from a recent survey conducted at the University of Oslo, which included 9,450 students (Bygstad et al., 2022). Although the students reported that the quality of teaching was reduced, their actual progress was not hampered. Students seemed able to adapt and adopt too.

I have discussed my further development of digital teaching with my colleagues at NHH and at other institutions, and there is expanding literature on the issue (e.g., Benavides et al., 2020; Bygstad et al., 2022). Today, the digital transformation of higher education seems to be characterized by two separate streams. One centralized stream deals with shared solutions, such as learning management systems (Canvas), library systems (Leganto), and the digital auditorium, led by the institutions' central administrative functions. The other is a decentralized knowledge domain and pedagogical- oriented

stream that deals with new learning forms and interactivity based on novel technologies, such as Zoom, MS Teams, YouTube, mobile phones, gaming (Curipod, Pedlet, Mentimeter, and Kahoot), and digitized material, led by the teachers individually. Thus, the current digitalization of higher education is both top-down and bottom-up, with little synchronization between the two. This creates a heavy burden on us, the teachers, who must gradually learn through experimentation and failures, with little support from the institution and our collegial community. For the students, one challenge is that the mix of technologies and practices vary, depending on the subject and the teacher. It appears that one key issue ahead of us is to align the two streams towards a common *digital learning space*, through an organization and sequencing of activities that allows students and teachers to interact relatively seamlessly (Bygstad et al., 2022). Innovations in digital teaching and learning are not just technical innovations, but rather academic, curricular, organizational, and structural innovations. My main plan for further development is to explore the concept of a digital learning space further. I intend, in collaboration with the persons with whom I share the course responsibility, to take advantage of the numerous digital opportunities in order to develop new roles for teachers and students, create flexible and motivating ways of learning, and enable students to be even more autonomous and collaborative.

References

- Benavides, L., Arias, J., Serna, M., Bedoya, J., & Burgos, D. (2020). Digital transformation in higher education institutions: A systematic literature review. *Sensors*, 20, 1–22.
- Biggs, J., & Tang, C. (2011). *Teaching for quality learning at university* (4th ed). Society for Research into Higher Education & Open University Press, England.
- Bonwell, C. C., & Eison, J. A. (1991). Active learning: Creating excitement in the classroom, *ASHEERIC Higher Education Report No. 1*, George Washington University, Washington, DC.
- Boud, D. (2000). Sustainable assessment: Rethinking assessment for the learning society. *Studies in Continuing Education*, 22(2), 151–167.
- Bygstad, B., Øvrelid, E., Ludvigsen, S., & Dæhlen, M. (2022). From dual digitalization to digital learning space: Exploring the digital transformation of higher education. *Computers & Education*. Available online 5 February 2022.
- Carless, D., & Boud, D. (2018). The development of student feedback literacy: Enabling uptake of feedback. *Assessment & Evaluation in Higher Education*, 43(8), 1315–1325.
- Dochy, F., Segers, M., Bossche, P. V. den, & Gijbels, D. (2003). Effects of problem-based learning: A meta-analysis. *Learning and Instructions*, 13, 533–568.
- Gaffney, J. D. H., Richards, E., Kustisch, M. B., Ding, L., & Beichner, R. J. (2008). Scaling up education reform. *Journal of College Science Teaching*, 37(5), 18–23.
- Gokhale, A. A. (1995). Collaborative learning enhances critical thinking. *Journal of Technology Education*, 7(1), Retrieved 5 February 2022 from: <https://scholar.lib.vt.edu/ejournals/JTE/v7n1/gokhale.jte-v7n1.html>.
- Harrison, S., & Grant, C. (2015). Exploring the new models of research pedagogy: Time to let go of the master-apprentice style in supervision? *Teaching in Higher Education*, 20(5), 556–566.
- Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychological Review*, 16(3), 235–266.
- Hägg, G. (1998). *Praktisk retorikk*. Hegnar Media, Oslo.

- Iden, J. (2009). *Business process management. The RIS methodology*. Institutt for prosessutvikling og arbeidsløst AS. Bergen.
- Iden, J. (2013). *Prosessutvikling. Håndbok i modellering og analyse av prosesser*. Tapir akademisk forlag. Trondheim.
- Iden, J. (2018). *Prosessledelse*. Fagbokforlaget. Bergen.
- Johnson, D. W., Johnson, R. T., & Smith, K. A. (1991). Cooperative learning: Increasing college faculty instructional productivity. *ASHE-ERIC Higher Education Report No. 4*. Washington, DC: George Washington University, School of Education and Human Development.
- Kabza, E. M., Berre, A. J., Murad, H., & Mansuroglu, D. (2020). Evaluating pedagogical practices supporting collaborative learning for model-based system development courses. *Proceedings from the Norwegian ICT conference for research and education*, Hønefoss.
- Laal, M., & Ghodsi, A. M. (2011). Benefits of collaborative learning. *Procedia – Social and Behavioral Sciences*, 31, 486–490.
- Metcalf, A., & Game, A. (2008). Significance and dialogue in learning and teaching. *Educational Theory*, 58(3), 343–356.
- Merill, M. D. (2002). First principles of instruction. *Educational Technology Research and Development*, 50, 43–59.
- Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education*, 93(3), 223–231.
- Rashid, T., & Asghar, H. M. (2016). Technology use, self-directed learning, student engagement and academic performance: Examining the interrelations. *Computers in Human Behavior*, 63, 604–612.
- Ringom, B. (2013). *Lær å lære*. Akademika, Oslo.
- Risan, L., Christophersen, M., Enli, G., Eriksen, S., & Tkachenko, E. (2009). *Håndbok for ferske forelesere*. Universitetsforlaget, Oslo.
- Schank, R. C., Berman, T. R., & Macperson, K. A. (1999). Learning by doing. In C. M. Reigeluth (Ed.) *Instructional design theories and models: A new paradigm of instructional theory* (Vol. II, pp. 161–181), Mahwah, NJ: Lawrence Erlbaum Associates.
- Shannon, C. E. (1949). Communication in the presence of noise. *Proceedings of the IEEE*, 37, 10–21.
- Weise, M. R. (2021). *Long life learning: Preparing for jobs that don't even exist yet*. John Wiley and Sons.
- Xie, Y., & Reider, D. (2014). Integration of innovative technologies for enhancing students' motivation for science learning and career. *Journal of Science Education and Technology*, 23(3), 370–380.