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Fundamental pedagogical view and description of practice

My view on teaching stems from the belief that students and teachers alike are citizens in a world of high complexity that requires continuous adaptation to grasp and comprehend it. Teaching and learning is consequently a field that necessitate using multiple modalities of delivery and participation in and outside the classroom. Given the pace of knowledge and technology creation, I have few preceding expectations regarding my students' prior knowledge or insight into any of the domains I teach when starting a class. However, I do expect them to be inquisitive and curious. Learning is exploration, and requires participation and engagement from both student and teacher alike. In this sense, one of the teacher's most important tasks is to help transform abstract ideas into tangible constructs. I seek to complement my passion for the teaching matter, and my experience from both practice and research, with student-oriented encouragement for them to partake in a mutual investigation of the subject domains. This mutuality is inspired by the formation theory of Wolfgang Klafki, in which both reality and humans open up to each other when subjectivity meets objectivity. Consequently, I seek to build my teaching in examples and cases that are relatable for the students, and which enable them to include themselves in the teaching, catalyzed by familiarity. To further ground my courses in real life, I always seek to invite external lecturers from Industry. This is a popular event with the students, as it adds perspective to both the curriculum, and the students' future professional life.

As a lecturer in engineering, a substantial part of my teaching is anchored in specific domains; healthcare, health informatics, information and cyber security. In these fields, ongoing adaptation is required to keep the teaching content relevant and up to date. To achieve this, I make sure to involve recent events and incidents from media and research projects. Shifting between cases, the curriculum, others, and my own research, is a movement between the learning quadrants coined by Healey as a way to frame research-based teaching. I strive to open the students' perception of themselves as multidisciplinary experts whose formation hinges on collaboration and self-application in the field of study. Thus, I use tools such as student-to-student presentations, peer review of assignments, and group work in assignments, and in-class discussions. As future professionals, the students should feel comfortable in assessing the work of peers, not simply amassing knowledge from external sources. Furthermore, I thoroughly believe in the value of experimentation and play as effective means for students to engage in collaborative learning and exploration.

During the years, I have utilized a number of different techniques and tools in order to engage and activate students in classes. This has ranged from arranging student presentations, labs in Health Informatics (e.g. OpenMRS & FHIR) and Data Security & Privacy (Kali Pentesting & Metasploit), role-playing, card games, cased-based teaching & discussions. Figure 1 portrays some of my students engaged with the card game D0x3d to learn the process, mechanics, and phenomena present in cyber security attacks.

Teaching experience

2014 : Foundational Software Engineering - BSc level - Software Engineering
2016-2019 : Health Informatics - MSc level - Welfare Technology
2016-2019 : Data Security & Privacy - MSc level - Welfare Technology
2018-2019 : Health Informatics - MSc & BSc level - Welfare Technology
2018-2020 : Patient Inddragelse & Sundhedsteknologi - MSc level - Medicine

Supervision

Master & Bachelor level

In total I have supervised, or co-supervised, 15 Master thesis projects and 7 Bachelor projects.

Supervision of In-company periods

Since 2016, I have supervised six students during their elective in-company periods (15 ECTS). The in-company period is a way for students to gain experience with industry through dedicated project work and application of experiences from their completed courses.

Supervision of PhD Students

2019-now Co-supervisor for externally funded PhD student at the Center for Health Informatics and Technology. The aim of the PhD project is to build novel models for detection of patient deterioration based on data and experiences from the Patient Deterioration Warning System project.

Formal pedagogical education

In 2019 I completed the Lecturer Training Programme offered by the University of Southern Denmark. This consists of course work activities, individual and collegial supervision, engagement with e-learning tools, and a pedagogical development project. The certificate of completion is attached to the main application.

Courses taken as part of the Lecturer Training Programme

- Research Based Teaching (RBT): Framing and using RBT in own teaching.
- Students as learners: Review of critical incidents as a teacher, addressing biases, expectations and beliefs about teaching and learning.
- Public speaking and presentation skills training: Enhancing presentation skills and vocal confidence.
- Supervision – Roles and Relations: How to meet the needs and challenges of each student.
- Students' academic writing skills: Tools to guide and engage students with academic writing.

Administration and study programme development

I am a member and active participant in the Educational Committee for the Engineering programme in Welfare technology where I manage the development of the Master's specialization in Health Informatics. Also, I have designed the courses 'Health Informatics' and 'Data Security & Privacy' from scratch, and am responsible for the upkeep and relevance of course descriptions for each of these. Additionally I have participated in the design of 'Patientinddragelse og Sundhedsteknologi' (Patient involvement and health technology) for Master's medical students, and remain a member of the organizing group.

Pedagogical development projects

As a lecturer, I have found that students rely very heavily on slide handouts during class for notetaking. While elaborate handouts can be comforting for the students, for some it may have the adverse effect of impeding in-class concentration and learning as a whole. To investigate the effect of lecture slides, as part of my lecturing training programme, I conducted a development project focusing on the effect of making slide handouts available prior to, after, or not at all in my Health Informatics courses for bachelor and master students. There is an observed association between quality of notes taken during class, and realization of learning objectives. Providing students with partially complete handout slides has also been found to have an adverse effect on student attentiveness during class.

To assess the impact and importance of slide handout timing, I tested the students self-observed perception on note quality over a period of six lectures. At two of the lectures slides were made available prior to class, two lectures after class, and two lectures without any slides at all. During the six lectures the students short term recall ability was assessed with mini-quizzes, and four students shared all their notes with me after each lecture. After the last lecture, students were asked to reply to a short questionnaire that gauged their own opinion on the effect slide availability had on the quality of their notetaking.

In total 33 students participated in the course, and 27 students responded to the questionnaire. A majority of students pointed out that they made more notes, but of lower quality, when no slides were available. A total lack of handouts caused considerable frustration, and could negatively harm the students' ability to concentrate and selectively filter the actual teaching. A potentially unfortunate effect of handouts, is their status as pseudo-curriculum. If handouts do not have this status, this should be firmly debunked early in the course.

Strategic teaching and educational goals

Given ongoing involvement with the Center for Health Informatics and Technology, and the bachelor and master programmes in Welfare Technology (Velfærdsteknologi). I would like to reform the master's degree in Health Informatics to better equip the students for the challenges and opportunities of working in health informatics. I will strive to mold the degree and study environment through the following initiatives:

- Strengthen the representation of informatics and software engineering topics in the bachelor programme for Welfare Technology. A substantial part of the graduates in Welfare Technology are employed in fields where system design and IT management are needed skills.
- And accordingly update the master's programme for in Health Informatics to equip graduates to better engage with a broader part of the software development life cycle. This would especially focus on providing them with process and development tools.
- Build information technology lab environments, both virtual and physical. These can be used in the Health Informatics course to exemplify and demo electronic health record systems, lab/order entry systems, logistics, and device simulators to work with national and international interoperability standards. Such a lab could also be utilized in several other of the courses in the Welfare technology programme. Especially in the Data Security & Privacy course where it could be used to simulate real working environments and IT infrastructures and thus be used for blue/red-team scenarios and assignments.
- Establish a Nordic collaboration network for health informatics degree programs and ensure that our students are ready and able to participate in exchange programs as part of their study.

In addition to my engagement with engineering students, we have recently begun lecturing medical students in health informatics. It has been a revelation how little the importance of information technology plays in the minds of soon to be

physicians. In my opinion, there is a pressing need to advance the inclusion of informatics topics in the medical master's programme. Just as research is striving to become more interdisciplinary, so should the medical and engineering educational programmes.