Teaching portfolio

1. Teaching CV: A list of teaching and supervision tasks, including specification of academic fields, scope, level (bachelor, master, continuing education, PhD). Please state the teaching method used (e.g. lecture, class teaching, exercises, supervision, examination, coexamination, distance teaching, internet-based teaching and evaluation of teaching). Please also indicate the language of instruction.

TEACHING EXPERIENCE

Course name: Real Time Computer Graphics
Education programme: MSc in Medialogy
Institution: Aalborg University - AAU
Teaching language: English
ECTS: 5
Academic period: Autumn 2022
Number of students: approximately 30
Official workload: 60%
Course evaluation results: ongoing
Role: Course manager and teacher
Responsibilities: managing, planning (shared), teaching (shared), exercises (shared), supervision (shared), and grading (shared).
Teaching activities: Lectures followed by exercises. Mandatory assignments to evaluate the progress of students. Final project with supervision. Oral examination.

Course name: Programmering af interaktive 3D verdener
Education programme: BSc in Medialogy
Institution: Aalborg University - AAU
Teaching language: English
ECTS: 5
Academic period: Autumn 2022
Number of students: approximately 60
Official workload: 70%
Course evaluation results: ongoing
Role: Course manager and teacher
Responsibilities: managing, planning (shared), teaching (shared), exercises (shared), and grading (shared).
Teaching activities: Lectures followed by exercises. Mandatory assignments to evaluate the progress of students. Final project with supervision. Written examination.

Course name: Machine Learning for Media Experiences
Education programme: MSc in Medialogy
Institution: Aalborg University - AAU
Teaching language: English
ECTS: 5
Academic period: Autumn 2022
Number of students: approximately 30
Official workload: 25%
Course evaluation results: ongoing
Role: Teacher
Responsibilities: planning (shared), teaching (shared), exercises (shared), supervision (shared), and grading (shared).
Teaching activities: Lectures followed by exercises. Mandatory assignments to evaluate the progress of students. Final project with supervision. Oral examination.

Course name: Rendering Light Simulation
Education programme: MSc in Lighting Design
Institution: Aalborg University - AAU
Teaching language: English
ECTS: 5
Academic period: Autumn 2022
Number of students: approximately 20
Official workload: 30%
Course evaluation results: ongoing
Role: Teacher
Responsibilities: teaching (shared) and exercises (shared).
Teaching activities: Lectures followed by exercises. Mandatory assignments to evaluate the progress of students. Oral

examination.

Course name: Graphics Programming
Education programme: MSc in Games
Institution: IT University of Copenhagen - ITU
Teaching language: English
ECTS: 7.5
Academic period: Fall 2021
Number of students: 29
Official workload: 50%
Course evaluation results: course - 5.7/6, teacher - 5.9/6
Role: Course manager and teacher
Responsibilities: managing, planning, teaching (shared), exercises, supervision, and grading.
Teaching activities: Lectures followed by exercises. Mandatory assignments to evaluate the progress of students. Final project with supervision. Oral examination.

Course name: Game Programming
Education programme: MSc in Games
Institution: IT University of Copenhagen - ITU
Teaching language: English
ECTS: 7.5
Academic period: Fall 2021
Number of students: 38
Official workload: 75%
Course evaluation results: course - 4.6/6, teacher - 5.0/6
Role: Course manager and teacher
Responsibilities: managing, planning, teaching (shared), exercises (shared), supervision (shared) and grading.
Teaching activities: Lectures followed by exercises. Mandatory assignments to evaluate the progress of students. Final project with supervision. Oral examination.

Course name: Algorithms for Games Development
Education programme: MSc in Games
Institution: IT University of Copenhagen - ITU
Teaching language: English
ECTS: 7.5
Academic period: Spring 2021
Number of students: 26
Official workload: 65%
Course evaluation results: course - 5.5/6, teacher - 5.7/6
Role: Course manager and teacher
Responsibilities: managing, planning, teaching (shared), exercises (shared), supervision (shared) and grading.
Teaching activities: Lectures followed by exercises. Mandatory assignments to evaluate the progress of students. Final project with supervision. Oral examination.
Observations: Online due to COVID restrictions.

Course name: Graphics Programming
Education programme: MSc in Games
Institution: IT University of Copenhagen - ITU
Teaching language: English
ECTS: 7.5
Academic period: Fall 2020
Number of students: 20
Official workload: 50%
Course evaluation results: course - 5.1/6, teacher - 5.6/6
Role: Course manager and teacher
Responsibilities: managing, planning, teaching (shared), exercises, supervision, and grading.
Teaching activities: Lectures followed by exercises. Mandatory assignments to evaluate the progress of students. Final project with supervision. Oral examination.
Observations: Online due to COVID restrictions.

Course name: Game Programming
Education programme: MSc in Games
Institution: IT University of Copenhagen - ITU
Teaching language: English
ECTS: 7.5
Academic period: Fall 2020
Number of students: 36

Official workload: 100%
Course evaluation results: course - 4.9/6, teacher - 4.5/6
Role: Course manager and teacher
Responsibilities: managing, planning, teaching, exercises (shared), supervision and grading.
Teaching activities: Lectures followed by exercises. Mandatory assignments to evaluate the progress of students. Final project with supervision. Oral examination.

Course name: Algorithms in Games
Education programme: MSc in Games
Institution: IT University of Copenhagen - ITU
Teaching language: English
ECTS: 7.5
Academic period: Spring 2020
Number of students: 26
Official workload: 100%
Course evaluation results: course - 5.7/6, teacher - 5.8/6
Role: Course manager and teacher
Responsibilities: conceiving, managing, planning, teaching, exercises, supervision (shared) and grading
Teaching activities: Lectures followed by exercises. Mandatory assignments to evaluate the progress of students. Final project with supervision. Oral examination.
Observations: Partially online due to COVID restrictions.

Course name: Graphics Programming
Education programme: MSc in Games
Institution: IT University of Copenhagen - ITU
Teaching language: English
ECTS: 7.5
Academic period: Fall 2019
Number of students: 20
Official workload: 50%
Course evaluation results: course - 5.0/6
Role: Course manager and teacher
Responsibilities: managing, planning (shared), teaching (shared), exercises (shared), supervision and grading.
Teaching activities: Lectures followed by exercises. Mandatory assignments to evaluate the progress of students. Final project with supervision. Oral examination.

Course name: Game Programming
Education programme: MSc in Games
Institution: IT University of Copenhagen - ITU
Teaching language: English
ECTS: 7.5
Academic period: Fall 2019
Number of students: 34
Official workload: 60%
Course evaluation results: course - 4.8/6
Role: Course manager and teacher
Responsibilities: managing, planning (shared), teaching (shared), exercises (shared), supervision (shared), and grading (shared).
Teaching activities: Lectures followed by exercises. Mandatory assignments to evaluate the progress of students. Final project with supervision. Oral examination.

Course name: Virtual Reality
Education programme: MSc in Computer Science
Institution: Swiss Federal Institute of Technology in Lausanne - EPFL
Teaching language: English
ECTS: 4
Academic period: Spring 2014 and 2015
Number of students: 25 to 30
Role: PhD assistant
Responsibilities: hands-on exercises, project supervision and grading

Course name: C Programming
Education programme: BSc in Electrical and Electronic Engineering / BSc in Microengineering
Institution: Swiss Federal Institute of Technology in Lausanne - EPFL
Teaching language: English / French
ECTS: not specified
Academic period: Autumn 2013, 2014 & 2015

Number of students: 200 to 300
Role: PhD assistant
Responsibilities: exercises, project grading, managing a team of TAs

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SUPERVISION EXPERIENCE

Summary of supervision activities at AAU (2022):
Master thesis students (30 ECTS/student) – completed: 3
Semester project students (15 ECTS) – completed: 5, ongoing: 17

Summary of supervision activities at ITU (2019-2022):
Master thesis students (30 ECTS/student) – completed: 16
Bachelor project students (15 ECTS) – completed: 1
Professional Master projects (15 ECTS) – completed: 1
Project student (7.5 ECTS) – completed: 5

Summary of supervision activities at EPFL (2012,2016):
Master thesis students (30 ECTS/student) – completed: 2
Semester project students (10 ECTS) – completed: 5

2. Study/programme administration and management: Experience in programme management and coordination. A list of study administration tasks, e.g. study board membership, chair of study board, semester or course coordinator, accreditation tasks, etc. Experience in planning teaching activities. Experience in programme development. Participating in committees and commissions etc. on education issues.

Semester coordination:
- Semester 1 in the MSc in Medialogy (MED7) at AAU Copenhagen.

Course coordinator:
- Autumn 2022: Real Time Computer Graphics (MSc in Medialogy at AAU); Programmering af interaktive 3D verdener (BSc in Medialogy at AAU).
- Autumn 2021: Graphics Programming (MSc in Games at ITU); Game Programming (MSc in Games at ITU)
- Spring 2021: Algorithms for Games Development (MSc in Games at ITU)
- Autumn 2020: Graphics Programming (MSc in Games at ITU); Game Programming (MSc in Games at ITU)
- Spring 2020: Algorithms in Games Development (MSc in Games at ITU)
- Autumn 2019: Graphics Programming (MSc in Games at ITU); Game Programming (MSc in Games at ITU)

Experience in programme development:
- The MSc in games programme include two tracks, a design track and a technology track. I have participated in the reformulation of the technology track. The modifications were discussed in the summer of 2020 and put in place in the spring semester of 2021. The modifications concerned the selection of elective and specialization courses in the second and third semester of the education.

Planning teaching activities:
- Experience planning activities for all courses listed in item 1.

3. Formal pedagogical training: A list of completed courses in university pedagogy, PBL courses, workshops, academic development projects, collegial guidance and supervision, etc. Written assessment from the course in university pedagogy for assistant professors. Participation in conferences on pedagogy and didactics. Please enclose any documentation of the above, such as course certificates, references, etc

Completed the pedagogical training for assistant professors offered at the IT University of Copenhagen, internally known as the teaching development programme (TDP), with grade “Very competent”. Content and assessment below:
Programme modules
A. Mandatory courses and workshops
- Framing Course (2 course days)
-- Basic pedagogy and didactics
- Project & Thesis Supervision (1 course day)
-- Introduction to different supervisor roles. Ways to organize the supervision process
- Exam Seminar (1 course day)
-- Qualitative aspects of examination. Exam regulations

- practiseIT (4 days)
-- Peer observation activity: apply relevant pedagogical theories and didactic principles and methods. Discuss and reflect on teaching/learning practice
- Learning technologies (2 days)
-- Presentations and individual experiment on applying technologies in concrete context such as lecture or tutoring
B. Elective workshops (2 hour each)
- New Course Evaluations, Engaging student presentations, Online pedagogies, Mentimeter
C. 2 assignments approved by departmental advisor and supervisor
- Analysis of a course managed by the assistant professor
- Abstract and analysis on own pedagogical competences and development as a teacher during the Teacher Development Programme
D. Presentations by the assistant professor
- Gathering and providing feedback – lessons from online teaching
E. Practical training
- Mentoring by an experienced faculty member (departmental advisor), as well as by an external, senior pedagogical supervisor. Both the departmental advisor and the supervisor observe and evaluate the teaching activities of the assistant professor. The subsequent dialogue between the departmental advisor, supervisor and the assistant professor is designed to identify areas for improvement and self-development
F. Personal Teaching Portfolio

Assessment of Teaching Skills
- Name: Assistant Professor, Henrique Galvan Debarba
- Department: Digital Design, IT University of Copenhagen
- Departmental Advisor: Full Professor, Kaspar Støy, Computer Science
- External Supervisor: Annette Hildebrand Jensen, Copenhagen Learning
Basis of assessment:
- Departmental Advisor's areas of observation: Teaching, Supervision, Exam
- External Supervisor's areas of observation: Teaching, Supervision, Exam
- Assignments: Both assignments are approved

Teaching Assessment Statement concerning Henrique Galvan Debarba
- Henrique has completed the TDP to the full satisfaction of the external supervisor and the internal mentor.
- Henrique has been teaching Master's level courses ranging from project courses for small teams to medium-sized, regularly taught classes.
- Henrique is an engaging teacher and will in lectures seamlessly switch between material dissemination, live derivation of mathematics, and exercises and projects to activate the students. Henrique's didactic skills on planning and executing teaching sessions which is based on thorough knowledge about pedagogical theory, is well reflected in sessions with the internal mentor and the external supervisor. Especially class management and Henriques's own professional appearance and communication in class has been in focus.
- Furthermore, Henrique has experimented with his use of voice to make more engaging lectures and increased his ability to facilitate dialogue as part of his lessons. The learning environment is characterized by Henrique's presence and curiosity regarding the students and their learning.
- In oral examinations Henrique is calm and methodical. His questioning is at an appropriate level and structure to facilitate the students' knowledge and reflections and further create basis for determining a fair and accurate grade in line with the intended learning outcomes of the course. In group examinations he ensures that all members have an equal opportunity to make themselves heard and to demonstrate their understanding of the subject area. He also takes the time to motivate and explain the grades that the students get clearly and unambiguously and in line with the grading scale.
- Henrique is exemplary addition to the ITU teaching roster and we are pleased to give him the grade:
-- Very Competent
Signed by:
- Full Professor, Kasper Støy (Departmental Advisor, IT University of Copenhagen)
- Consultant, Annette Hildebrand Jensen (External Supervisor, Copenhagen Learning)

Completed a two days workshop about problem based learning (PBL) offered by Aalborg University:
K U R S U S B E V I S D I P L O M A
- Henrique Galvan Debarba has attended "Basic Course with focus on PBL", 28 April and 23 May 2022
- AAU Learning Lab, Aalborg University, May 2021
Objective:
- The participants have been introduced to the PBL, AAU-model by exposing them to a direct experience of PBL and the option of active investigation and evaluation of their own PBL-related practice in the intermediate period between the two workshop days.
- The participants have been provided with the insight and the skills necessary to conduct effective PBL project facilitation at AAU.
Content:
- The course content was centered on the 5 major elements of PBL, the AAUmodel as well as Assessment:
-- The PROBLEM - including introduction to the underpinning learning theory. i.e the rationale for PBL (student-centred learning in groups, learn to learn, critical, higher order knowledge)

-- The PROJECT work organization - including project and time management
-- The GROUP work form - including learning in teams and group dynamics, roles and rules, peer evaluation
-- The FACILITATOR - including facilitation types, styles and roles; situational facilitation; pitfalls and responsibilities;
-- The COURSES and other types resources - including how can we teach in a more PBL- oriented way: from teacher-centeredness to studentcenteredness.
-- PROJECT ASSESSMENT, individual and group-based assessment - including taxonomies, the exam situation and questioning technique and facilitating group interactions.

4. Other qualifications: Conference contributions and attendance, contributions to debates, scientific articles on pedagogical issues etc. Peer supervision, editorials, mentoring experience or other types of competence development activities.

I have not participated in conferences and did not conduct research on the subject of teaching or education.

5. Pedagogical development and research: Development of new courses, teaching materials, teaching methods, examination types or other types of pedagogical development. Didactic and pedagogical research. Cooperation with external collaboration partners.

As aforementioned, I have developed the following course:
- Real Time Computer Graphics, MSc in Medialogy (AAU). Running for the first time in the Autumn of 2022.
- Programmering af interaktive 3D verdener, BSc in Medialogy (AAU). Running for the first time in the Autumn of 2022.
- Algorithms for games development. MSc in Games (ITU). Two iterations, in the Spring of 2020 and in the Spring of 2021.

I have developed teaching materials for all courses listed in item 1. The teaching activities and examination type are listed in the item 1.

External collaboration:
- Guest lectures from practitioners in many of the courses listed in item 1.

6. References on your teaching skills from superiors or colleagues. Teaching evaluations and any teaching awards received.

I have received two indications for the ITU teaching prize by my education programme (MSc in Games), the first in 2020, and the second in 2021. Unfortunately, I did not win the prize in both occasions.

The indications are made by the respective Heads of Programme at the IT University of Copenhagen. In 2020, I was recommended by Martin Pichlmair, in 2021, I was recommended by Martin Pichlmair and Hanna Wirman.

I recommend contacting Martin Pichlmair (mpic@itu.dk) and Hanna Wirman (wirman@itu.dk) for more information on my teaching qualifications.

Below is the transcription of a recommendation letter from Martin Pichlmair, written in the autumn of 2021:

Dr. Martin Pichlmair
Head of Games Programme
IT University of Copenhagen
Copenhagen, October 7th, 2021

Re: Recommendation letter for Henrique Galvan Debarba.

To whom it may concern,

I was heading the university programme that Henrique was teaching in during the years
he spent at IT University of Copenhagen and part of the hiring committee that selected him. Our games programme is a 2 year master at a public university. While I was not Henrique’s personnel responsible, the quality of the teaching in the programme falls under my responsibility. As such I have received and read all his course evaluations and was also the natural recipient of informal feedback by students and faculty.

We were looking for a teacher with his profile and excited when Henrique applied. It was
immediately clear that he is a dedicated teacher and highly motivated. Accordingly, I was happy to give Henrique full control over two, later three, courses. In record time, he turned a struggling first semester course into a successful one. He revised two courses and designed one new course from scratch. At the same time he supervised countless projects and master theses. Henrique was also involved in the reform of the technical part of the Games programme.

Additionally, he has proven that he can co-teach with people of very different backgrounds and styles. After only a short

while his evaluations and other feedback I received were universally positive. So positive, that I proposed him for the teaching prize that the university awards for high quality teaching.

I wish Henrique all the best for his future efforts. He will be missed here at IT University of Copenhagen as a great teacher and colleague.

[signature] Martin Pichlmair

7. Personal reflections and initiatives: Here you may state any personal deliberations as regards teaching and supervision, any wishes and plans for further pedagogical development, plans for following up on student feedback/evaluations, etc. Personal reflections on your own pedagogical practice, including objectives, methods and implementation. This should include an analysis and a reasoned description of your pedagogical activities in relation to your pedagogical understanding and student learning. Thoughts on the teaching method at Aalborg University (which is largely based on group-organised project work and problem-based learning)

Abstract

As a principle, when planning and delivering teaching activities, I try to always keep in mind that students learn from the things that they do, and only indirectly from the things that I do. That is, it is the engagement of their cognitive processes, either quietly as they attend a lecture, loudly as the class discuss a topic, or actively as they participate in hands-on sessions, that promotes activation and creates the impression of the content that they will keep for themselves. This helps me to take the perspective of the student, and to place them at the center of the learning process.

In my teaching, I pursue to foster students' interest in the subject of study and how to expand knowledge critically and independently. Working in the field of applied sciences, I tend to prefer activities where students will have hands-on and will be able to build and visualize the outcome and impact of their effort. I believe that being able to create something that can be held or visualized enhances motivation and help triggering long-term interest for a subject.

Nevertheless, I believe that lectures play an important part in the teaching of technical topics. When lecturing, I aim to create opportunities for students to reflect and discuss about the topic. Whenever possible, I present the content in different modalities and perspectives, and attempt to promote a dialogue with students to increase and sustain a high degree of engagement with the content.

I also see teaching as an exchange and personal growth opportunity. Often, the process of exposing complex subjects and discussing them with students also enhances my understanding of that subject. In addition, student supervision can lead to an inverted relationship, where students become the experts on a topic that I am interest to learn more about.

Finally, I believe that feedback is a fundamental resource in controlling and improving the quality of teaching and learning. Teacher’s feedback can help students direct their effort and work more efficiently towards the goals set for a given course of studies, but it is important to understand that feedback should run in both directions. Feedback from students is an invaluable resource for the development of a teacher.

Analysis

Introduction
In my tenure as an assistant professor, I have acquired significant teaching experience. From 2019 to 2021, I have managed several iterations of three different courses, namely Graphics Programming, Game Programming, and Algorithms for Games Development, always as the main responsible for planning and running the courses. Moreover, I have completed the supervision of nearly twenty master thesis or project students.

I also had the opportunity to plan and design a course from scratch, when in the spring of 2020 I proposed the course Algorithms for Games Development as a new elective course in our education programme. The objective of the course was to present foundational technical knowledge for games development, while introducing students to areas within my research interests, such as computer animation and procedural content generation. The course was very well received, leading to its reclassification into a specialization course, which meant that students in our study track would be automatically registered for the course.

My courses have been well received by students, consistently scoring well above the average in the course evaluation survey of the IT University. The positive feedback on my teaching also led to the recommendation, from the head of the MSc in Games programme, that I be awarded the university wide teaching prize in 2020 and 2021.

Participating in the teacher development program, on top of the activities above, represented a significant overhead, but it has been a profitable experience overall. The readings, sessions, discussions, and assignments promoted in the program provided me with the opportunity to reflect on my actions as a teacher and the impact that they may have on students, a formal framework of theory and concepts on which I can rely when I plan and conduct teaching, and a good understanding of the higher education system in Denmark.

Active learning

Active learning is defined as the act of engaging cognitively and meaningfully with the teaching material [1] and is at the core of established theories of learning, such as constructivism and social constructivism [2,3]. It is the cognitive engagement of the student that helps to generate activation, and prepare them to receive, process and retain new information. Given this context, when planning and delivering teaching activities, I try to always keep in mind that students learn from the things that they do, and only indirectly from the things that I do. That is, it is the engagement of their cognitive processes, either quietly as they attend a lecture, loudly as the class discuss a topic, or actively as they participate in hands-on sessions, that creates the impression of the content that they will keep for themselves.

For example, I generally incentivize students to discuss assignment tasks and solutions with their peers, with the only requirement that the implementation (the source code that is handed-in) is written individually. I believe that the opportunity to articulate their view and understanding of the content to other students help to expose and identify gaps and misconceptions about the content, promoting the construction of a shared understanding, which is in line with social constructivism and the idea of the zone of proximal development [3].

Moreover, to generate cognitive engagement, and therefore activation, I believe that it is important for the teacher to be capable of taking the perspective of the student. This is a fundamental piece of the puzzle when it comes to supporting and implementing the most appropriate teaching approach for a given learning context, and will promote teaching that places the student at the center of the learning process.

Teaching activities

As a teacher in the field of applied sciences, I favor activities where students will have hands-on experience with the content. Teaching activities in my classes can be roughly grouped into three categories: communication of the content, where I use lectures, discussions, readings, and multimedia to explain the theory; exercises, where students can apply the content of the course on a supervised environment; and assignments, where students have the opportunity to work independently for most of the time.

I typically divide a class into two sessions, lecture and exercises. During the lecture, I am responsible for managing the time and have full control of what activities the students will participate and/or develop. As a rule of thumb, I attempt to break the monologue aspect of the lectures by proposing short activities and interruptions. Examples of activities include: visualizing some relevant idea with an interactive demonstration that students can test on their own computers; solving a short exercise that sums up a section of the lecture; typing a piece of code that will later be used in an exercise or assignment; watching a short video that exposes the topic of the lecture from a different and complementary perspective than the one I take; discussing lecture content in buzz groups. These activities are designed to communicate the technical concepts and ideas that are explained in class through different modalities, for example: how an equation translates into programming code, which is an activity that students often struggle to perform, or how these ideas can be visualized in an interactive application, often in the context of a real application.

Moreover, this lecture organization fits nicely with the idea of breaks and variance in lectures, as discussed by Bligh in [4], and echoed by Dahl and Troelsen in [5]. The argument is that concentration and information retention will reduce over time and, by inducing some form of activity variation, we can help to reset the student's mental state and renew concentration. There is a vague suggestion that lecture sessions should be no longer than 20 minutes. However, Bradbury [6] has noted that there is poor empirical evidence about how long the attention span of students really is during a lecture, and that this seems to depend more on the qualities of lecturer than on the students themselves.

In the time allocated for exercises, I let students manage their time while I follow their progress by discussing with the individual students or group of students. Not all students need the same degree of guidance, and the flexibility with scheduling during exercise sessions allows those who are confident on their performance in the course to work independently and/or rearrange their schedule as needed, whereas I get more time to discuss content and exercises with the students who are struggling in my course.

Furthermore, the teaching activity that I appreciate the most is the supervision of student projects. I find it rewarding because it gives me the opportunity to learn more about topics that are directly or tangentially related to my own research. In fact, five of my publications include work developed within the scope of student projects.

I generally create a list of potential subject topics to propose to students, but I appreciate both when the student come up with a topic or take on of my suggestions. What I prioritize is that the student should demonstrate some degree of intrinsic motivation to work on the topic that they have selected. To prepare for a project, I require students to get acquainted with the theoretical background from the start, where I normally provided readings and sample development material for preparation. We also define a project roadmap, anticipating the main milestones of the project and reserving some buffer time to compensate for potential delays. During the development of the project, I promote weekly supervision meetings,

where we start with a group meeting, including all students that I currently supervise, and proceed to individual project meetings as needed. Progress is assessed with a mid-semester presentation, where the status of the project can be reviewed by myself and the other students. Finally, I ask students to keep weekly notes on their project activities. These notes are used by me to keep track of their progress, and by the students to help writing the final report.

Online teaching

With the restrictions on movement and access to the university that were commonplace since March 2020, online teaching has naturally played a major role in my development as a teacher. In the spring of 2020, I had to quickly adapt, mid-semester, to different forms of teaching and examination while also considering the impact of that on students. This led to the exploration of different tools and lecture methods, attempting to identify how suitable these were in that context. Some of which I still find useful today, after the most severe restrictions have been lifted. For example, I still use Microsoft Teams to manage most of day-to-day course announcements and communication with students, and still record my lectures, so that the students who are unable to attend can have an easier time keeping up with the class.

I always aim to ensure that my students have full opportunity to learn and excel in a course. When faced with a challenge, I try to inquire on what would be the best use of my time, and what action I can take that would impact learning the most. For instance, in the fall 2020, online teaching increased the distance between teacher and students, and drastically reduced the search of guidance during the exercise sessions. To address this problem, I scheduled one additional, and optional, session with the teacher, where I would stream myself solving and explaining the exercises of the previous one or two weeks. This was aimed at increasing the opportunities for live coding examples, which are often requested by students, and to make the teacher feel more approachable to students. As a condition, I requested the participation of at least one student in order to run the additional session, but I had it recorded and available afterwards for students who were unable to join. I viewed this additional session as a replacement for office hours, which did not seem to create a lot of engagement in online teaching.

As a second example, in another course that was conducted online during the whole duration of the course, I moved some emphasis from content delivery to the interaction with the individual students. There, I did not care too much about how students would consume the lecture, as I observed that many have decided to watch the recording of the lecture on an asynchronous fashion, instead of joining it live. Instead, I enforced some form of active supervision in the development and correction of the mandatory assignments. The way I implemented that was by introducing oral corrections for all mandatory assignments in the course (three in total). The oral correction of assignments was designed to work as a dialogue between the student and the teacher, where the student had to describe how they solved each task in the assignment and the decisions that they had to make, while also explaining the rationale behind those decisions. For this type of content and tasks, oral feedback seemed to work well. In fact, most students have agreed that the oral correction of assignments was an improvement over the written feedback that I used in a previous course.

Feedback

I believe that feedback is a fundamental resource in controlling and improving the quality of teaching and learning. Teacher's feedback can help students direct their effort and work more efficiently towards the goals set for a given course of studies, but it is important to understand that feedback should run in both directions. Feedback on student's knowledge of the content and the quality of their work is necessary so that students can understand their limitations and focus their effort. Likewise, feedback from students is an invaluable resource for the development of a teacher. That is why I always implement course evaluation activities during the semester, and often acquire feedback when I experiment with new activities. Examples of that are the evaluation of the oral correction of assignments, which as I described above, was implemented to remedy the lack of direct communication between the teacher and students in online teaching.

Final thoughts

Finally, I believe that the range of effective teaching activities that a teacher can adopt is highly dependent on the contents that need to be taught, the cohort of students, and the teacher's ability to implement the activity.

When I started teaching, I was very concerned with the quality of my lectures, particularly with my oral communication skills. I saw lectures much like long versions of the research paper presentations that I would give now and then. That perspective was neither helpful for me nor the students. It did not work well for me because it creates a lot of overhead with the preparation of lecture material. It also frames lecturing as the performance of a long monologue, which is not one of my strengths since I lack public speaking training and often feel uncomfortable about being the center of attention. For the students, this format is too rigid, the teacher makes a script based on assumptions about what the average student (or the "implicit student" [7]) is and has difficulty to adapt to the actual students that he/she encounters in class.

To counter that model, more and more I attempt to conduct lectures as a dialogue with students, instead of a sequence of slides that are interleaved with activities in a tight and rigid lecture script. This is a lecture model that I believe to work well in inducing activation because students can engage in a feedback loop with the teacher. Even if many students avoid talking their minds in class to reduce their exposure, they are conducted to constantly reflect about their understanding of the topic and consider what they would say were they to answer the questions that I ask. Teaching becomes an iterative process where students are induced to present their current understanding of the content, exposing potential misconceptions and logical flaws, while the teacher oscillates between the roles of a facilitator and an authority on the topic, pointing out the contradictions and complementing the correct aspects of their answers. Much like in the theories of constructivism and social constructivism [2, 3], teacher and students cooperate in constructing a shared understanding of

the content.

Discussion and argumentation in teaching is supported in Haugsted and Ingerslev [8]. They recommend that the teacher should abstain from closing the discussion and presenting their expert point of view as much as possible. However, when it comes to communicating technical topics, I believe that the structure of the discussion can be streamlined to shorten the feedback loop since the content is generally more objective than in fields such as the humanities and the social sciences. Ideally, I believe that teaching can interleave very short lectures (teacher monologue) and discussion, not necessarily in this order.

Moreover, a potential advantage of driving lecture as a discussion with students is that it can thrive with less preparation of teaching material, since much of the explanation is developed on the go. The drawback is that the ability to improvise clear, interesting, and motivated explanations, that are shaped according to the input received from students, takes time and practice to develop. As a result, teaching quality is still proportional to the skill of the teacher as a performer. Conducting lectures that are engaging and draw student participation, which is necessary to drive a discussion, require good oral communication and interpersonal skills from the teacher as well as the development of a good relationship between students and teacher, and among the students. Horst and Ingerslev [9] list a series of actions that a teacher can take to develop good interpersonal relations between students and teacher, such as making the students feel welcome in the course, being present, learning their names, establishing an environment where everyone follows norms of good behavior, and spending informal time with them.

It is my experience that this can work well with small groups of students, but is much harder to implement in large classrooms, where many students make a deliberate effort to stay out of the teacher's reach, making it hard for the teacher to create a good interpersonal relation with the students. I also do not think that this format would work well were it to be implemented in online teaching. There is overhead attached to the active participation of students when the interaction is mediated via a computer interface that can break the flow of discussion and damage activation.

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8. Any other information or comments.

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