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## Fundamental pedagogical view

Throughout my career as a scientific educator, I have seen many models of how to teach the sciences. Perhaps the least effective, but sadly one of the more common models I have seen focusses on the memorisation of formula or facts. While perhaps effective for getting students to pass written exams, I believe that this is ultimately ineffective for preparing students to use scientific knowledge in their careers. It is well documented in the pedagogical literature that deep learning requires that knowledge is contextualised, so that students can connect it with their existing knowledge. When we consider that most students who study the sciences at a tertiary level are not aiming to become professional academics, we must ensure that we align our education with the goal of having students retain an understanding of scientific principles that they can use in other contexts. This means deep learning, contextualisation, and understanding of principles – not memorisation.

My fundamental pedagogical framework is constructivist, so I encourage my students to try and incorporate the knowledge they gain in my classes into their already existing understanding of the topic. This can be achieved through a number of ways, including discussion-based learning activities (either as a class or in groups), practical demonstrations and experiments (where possible), and working on exercises which relate to real-world scenarios. Most importantly though I aim to be cross-disciplinary in my teaching, so that the students can relate what they learn in my classes to what they learn in their other classes. I find this particularly important when supervising semester projects, where students have to apply the knowledge from their theory classes. In my experience, and based on feedback I have received from students, this style leads to much better student engagement, and overall much better learning outcomes.

## Teaching and supervision (SDU)

### Analytical Mechanics

Ebel, T., Greenbank, W. & Khan, M. A.  
06/09/2023 → ...

### Denis Ndi Ndi

Greenbank, W., Ebel, T. & Mo, W. K.  
01/02/2023 → 27/06/2023

### ENPHYS 2019

Greenbank, W. & Chiriaev, S.  
04/09/2019 → 29/11/2019

### Experts in Teams

de Oliveira Hansen, R., Greenbank, W. & Chaudhuri, S.  
01/09/2023 → 28/01/2024

### Experts in Teams

de Oliveira Hansen, R., Greenbank, W. & Chaudhuri, S.  
01/09/2024 → 31/01/2025

### Odysseas Gkionis-Konstantatos PhD (co-supervisor)

Greenbank, W.  
01/09/2021 → 31/08/2024

### **Phillip Klink bachelor project**

Greenbank, W.  
01/09/2020 → 20/01/2021

### **Physics (ENPHYS)**

Greenbank, W.  
01/09/2022 → ...

### **Semester projects (Semester 2 EE)**

Greenbank, W. & Olsen, B.  
02/02/2023 → ...

## **LTP Development Project - Preparing foreign first semester physics students for their first oral exam**

In my development project I wanted to experiment with and study the effect of the following changes in my teaching method on my students' preparedness and confidence level with oral exams:

1. Change how exercises are done in class. Previously the students had done them individually and I had presented the solution to them. Instead, after working individually on the exercises, they broke into groups and presented their solutions in the groups, asking questions of each other.
2. Change a bonus point assignment to an uploaded recorded presentation so that the students may practice presenting solutions orally in a manner similar to their final exam
3. Prior to the exam the students were provided with a rubric that set the expectations for the grades that the students could have received in the oral exam

The interventions were found to be successful in improving the students' preparedness for the oral exam, with the oral presentation assignment being rated as the most effective. The effectiveness of the interventions was measured using surveys of the students on Poll Everywhere, in which answers to the question "How prepared do you feel for the oral exam" were quantified and the numerical average was plotted – showing an increase in feelings of preparedness following each intervention. I also found that this method of obtaining feedback from my students on teaching and learning activities was very effective, and I think contributed to higher levels of engagement from the students.

## **Previous teaching and supervision outside of Denmark**

Université de Bordeaux and Institut Universitaire de Technologie de Bordeaux (FR)

During my PhD at the University of Bordeaux I undertook teaching of laboratory courses at the Institut Universitaire de Technologie de Bordeaux Mesures Physiques department between 2014 and 2016. I taught three undergraduate courses on thermal transfer, properties of materials, and chemical equilibria. This was done in both the French and English languages. I also supervised two bachelor students during this time.

Victoria University of Wellington (NZ)

My teaching career began as a student teaching assistant at Victoria University of Wellington in New Zealand, assisting with the teaching of chemistry and physics laboratory classes and tutorials between 2009 and 2012. This culminated in 2012 with me taking responsibility for all tutorials for a first-year chemical spectroscopy course.