From Corona Lockdown to Post-Corona Quiz Town

Steinmann, Casper

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Casper Steinmann
Associate Professor
Department of Chemistry and Bioscience

e-mail: css@bio.aau.dk
twitter: @caspersteinmann

Introduction

During the first lockdown of the pandemic in the spring of 2020, remote teaching was forced upon everyone, had to be done with new digital tools to conduct that teaching and in many cases *ad hoc* solutions were implemented as best as possible by all. Some things worked and others did not. An *AAUEngineering* post-corona project to bring forth best practices from the first lockdown and into semester courses was applied to the new **Chemical Bonding** course at BIO (3rd semester).

Results

The Chemical Bonding course was planned to have a considerable digital footprint from the start, but the post-corona project sped up the process and now the course is fully digital. Here is how:

- Multiple short lectures on Youtube. One video per concept. Multiple concepts every time.
- Only exercises during contact hours.
- Learning supported with multiple choice multiple answer (MCMA) quizzes **before**, **during** and **after** teaching.

Discussion

Lectures contain concepts that the students should know before class. During class, we spend time solving problems, understanding results and putting those concepts to work. The students are able to self-test with MCMA quizzes halfway through class (in order to move focus from answering quizzes correctly to understanding the background to a solved problem).

Use of multiple choice multiple answer quizzes at all levels of a course has the largest impact on ensuring learning outcome. Students can test themselves before class if they understand the concepts from the lectures. Otherwise, they re-watch the lectures until they can answer the quiz. They can test their understanding during exercises. Exercises forces student thinking instead of them being passive listeners.

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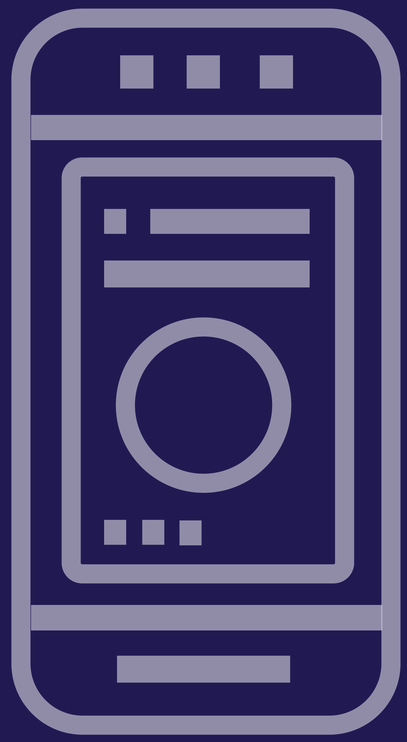
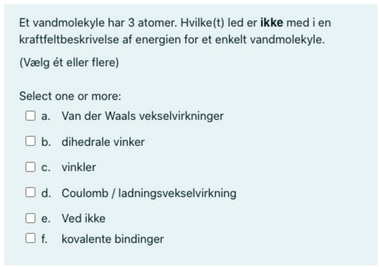
Facilitating learning and ensuring learning outcome in the hybrid post-Corona classroom is done with extensive use of **multiple choice multiple answer** quizzes at all levels of a course.

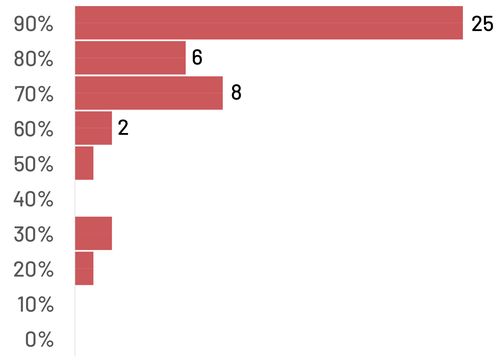


MCMA Quizzes in Moodle on a Topic

A specific topic is covered by 5 to 10 MCMA quizzes before class



It is possible to use the results from those quizzes to understand what the students learn. If they have misunderstood parts of a topic, corrective actions can be taken based on the statistics from the quizzes as shown in the histogram below.



Action Based on Statistics

The histogram above shows how many questions the students answered correctly. The mandatory quiz was taken after online lectures but before class. There was **no additional action** taken based on this, as the outcome of the lectures were understood by more than 75 % of the students.

Gamification of Workshops

Multiple workshops throughout the course is used to allow students to engage with the material they have been taught but in a more PBL-like setting. Elements of gamification (competition) is incorporated through Moodle so groups compete to maximize one or more quantitative scores.

Outlook

Direct interaction with students can happen through *live MCMA* quizzes. Platforms such as socrative.com requires questions to be made beforehand but are easily executed and can foster a healthy amount of peer-instruction. Many best-practices which are direct outcomes of this project, have already been incorporated in multiple modules at BIO: DataScience (4th semester), Supra Molecular Chemistry (8th semester) with more to come in the future.