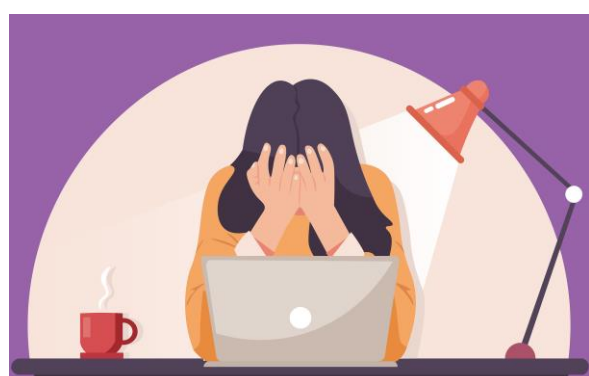


Developing blended-learning in chemical education

SUTQ project of Saskia Lindhoud

Blended-learning is the thoughtful integration and combination of face-to-face learning experiences with online learning experiences. In blended learning the role of a teacher changes from transmitter of content to facilitator of learning and the role of the student changes from receiver of content to a creator of knowledge.



Preknowledge on online learning experiences: a survey by Pei et al after the first lockdown found that some students indicated that they struggled with online learning and feel “*demotivated and disoriented, getting stressed*”. Teachers have similar concerns, *it's difficult to reach out to students to motivate and keep them on track*.

Research questions:

- RQ1. How can one use learning analytics data to better understand how students learn in an online learning environment?
- RQ2. What kind of learning analytics data are required to influence the online learning behaviour of students?
- RQ3. How does the incorporation of face-to-face peer-learning elements affect the learning outcome and motivation of the students?

Blended learning format: Flipped-classroom
Students: first year CSE, module 4

Learning activities



Online learning

How do students learn online:
learning analytics

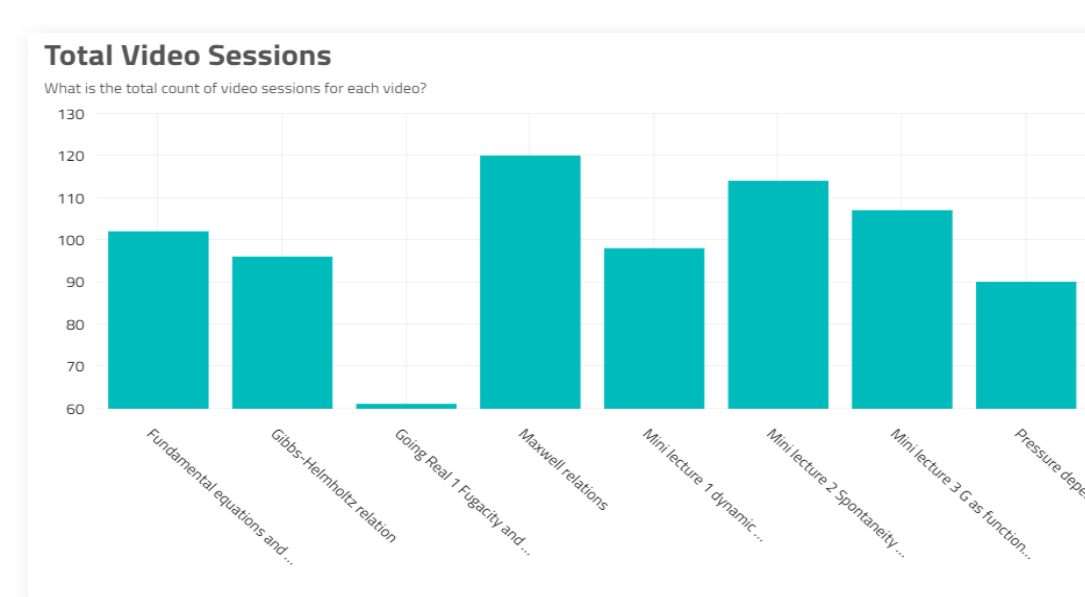
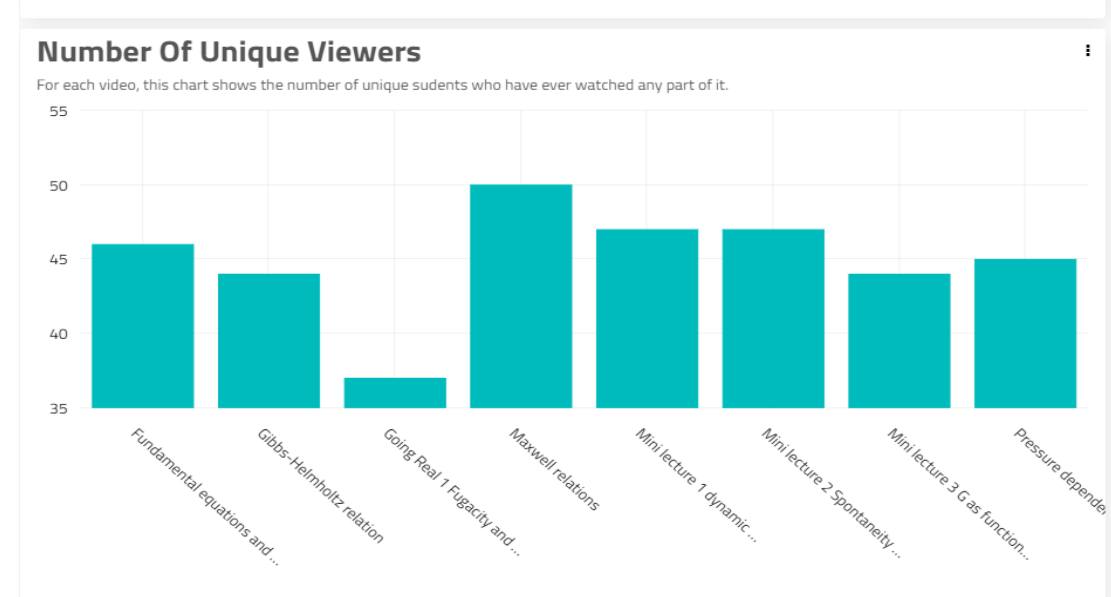


Face-to-face sessions

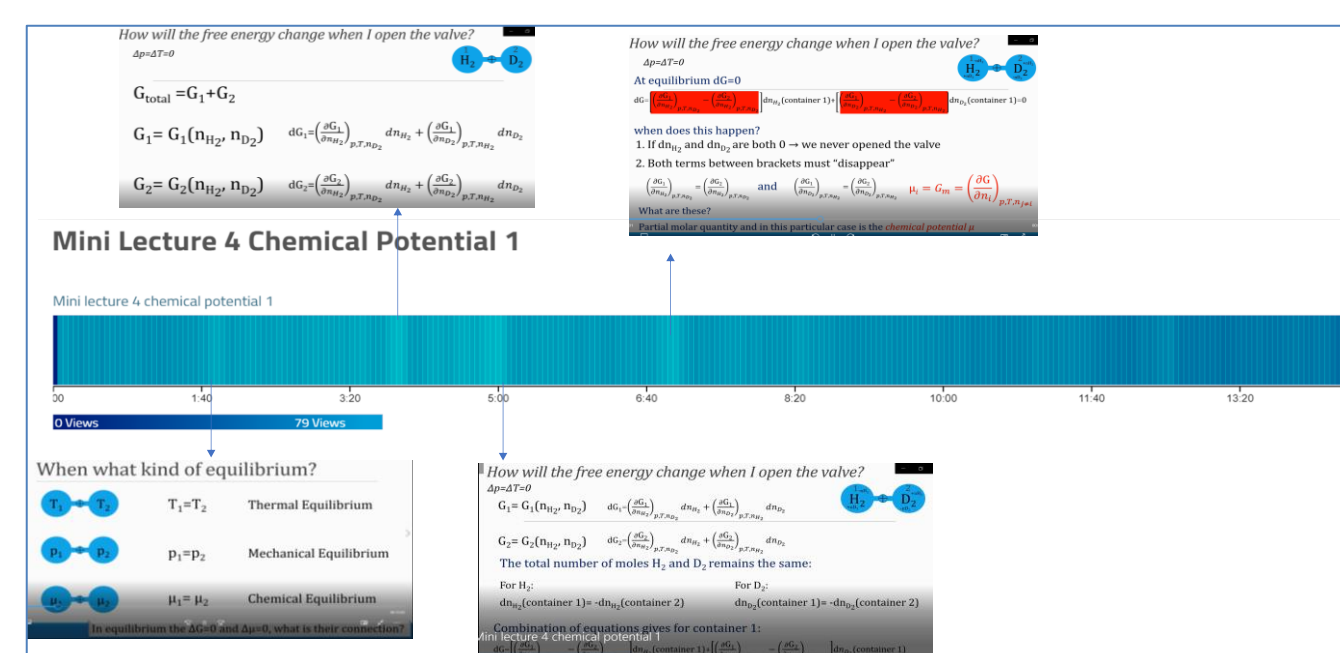
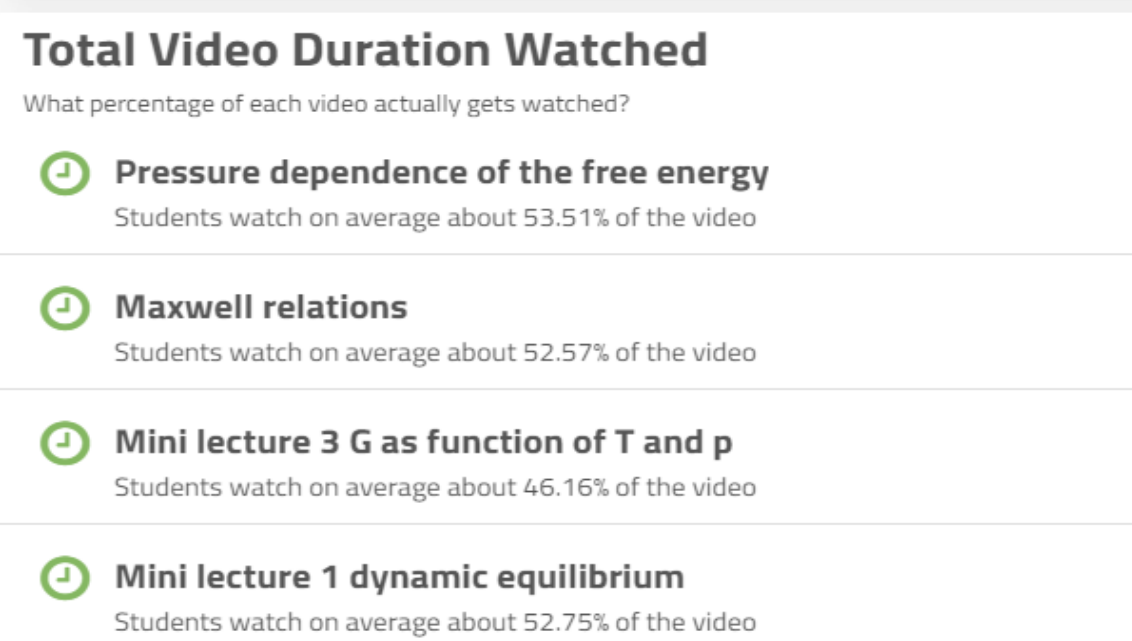
Face-to-face sessions:
peer-learning

- Tutorials
- Assignment/discussion
- Diagnostic test

Data

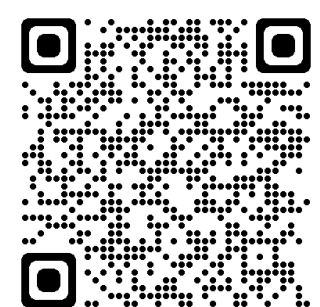


Evaluation:
Exam results
Interview
Anonymous Canvas survey



Main outcomes:

- RQ1: The learning analytics data confirmed that students watched the lectures, but the resolution was not good enough to know whether students were on track.
- RQ1: Students watch pencasts differently than minilectures. Pencasts are viewed in one go, minilectures are watched once and students seem to scroll back to parts that caught their attention.
- RQ2: A better time resolution is required to influence the online study behaviour of students.
- RQ3: The students liked the group discussions and felt that they were part of a learning community.



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