Workshop

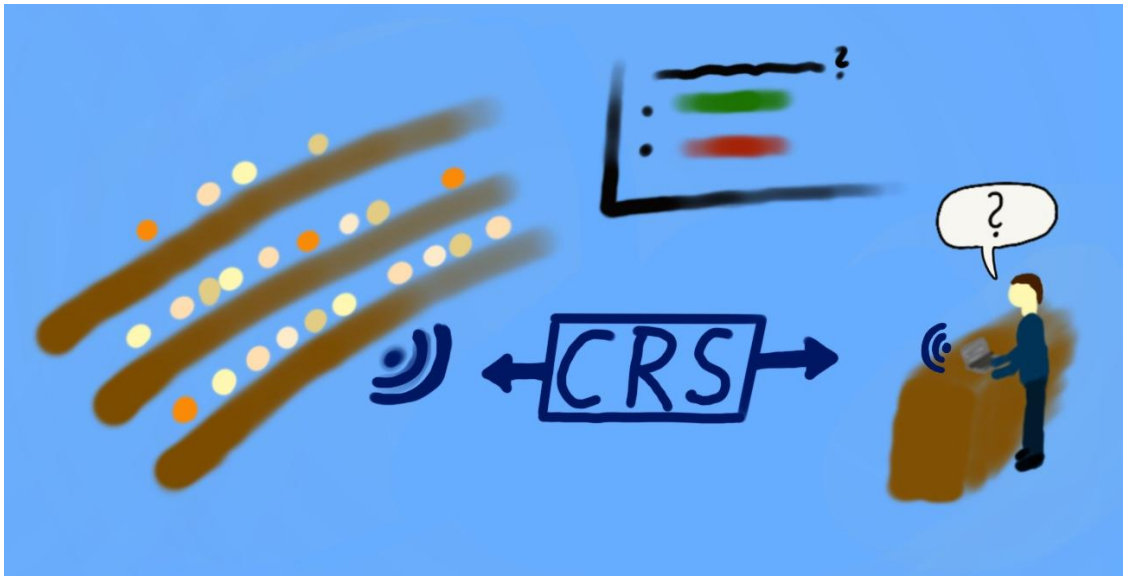
On Opportunities and Challenges of Classroom Response Systems

Gunnar Schwarz

Laboratory of Inorganic Chemistry, Department of Chemistry and Applied Biosciences, ETH Zürich, Vladimir-Prelog-Weg 1, CH-8093 Zürich, Switzerland

Relevance

Questions are a central aspect of teaching. In particular, provided exercises tend to drive the focus of students' learning activities. Meanwhile, lecturers who want to encourage their class to actively participate during lectures can be disheartened. Particularly in larger classes, it is common for only a few students to answer questions or take part in discussions around complex problems, which makes interactive pedagogy challenging. Polling the audience by raising hands or showing coded cards yields more feedback. Lately, electronic devices, mostly hand-held remote controls (clickers), were employed and prompted a range of new instruction styles, most prominently peer instruction by Mazur[1]. Recently, classroom response systems (CRS) that run on the mobile electronic devices of students have largely replaced "clicker" technology, and made CRS more accessible [2]. Implementing these CRS in the classroom requires consideration of how to best use the technologies, as well as careful design of course structure and questions posed with the CRS in order to preserve flow of the lectures. The main challenges circle around finding or phrasing adequate questions. CRS mostly rely on multiple-choice questions (MCQs) and their design is demanding [3], even if only used for exercise and not exams.



Content

- CRS as interfaces between lecturers and students
- Functionalities and variety of different and free-of-charge CRS
- Challenges, guidelines, and practical advice
- Open-ended and multiple-choice questions from simple to complex with strategies for asking for students' reasoning
- Example questions will be polled by the participants via CRS throughout the workshop

[1] C.H. Crouch, E. Mazur, *Am. J. Phys.*, **2001**, *69*, 970-977.
[2] M.E. Emenike, T.A. Holme, *J. Chem. Ed.*, **2012**, *89*, 465-469. b) J. MacArthur, *J.Chem.Ed.*, **2013**, *90*, 273-275. c) R.E. Gibbons et al., *J. Chem. Ed*, **2017**, *94*, 549-557.
[3] T.M. Haladyna, S.M. Downing, M.C. Rodriguez, *Appl. Meas. Educ.*, **2002**, *15*, 309-334.