

LSC:digital: Teacher Education, Teaching Practice, Curriculum Development - an interlinked approach on digital media in the science classroom

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Aims

- Developing new digital concepts for science education.
- Teaching practice and teacher training in the further development of the seminar "New Media and Computer Use in Chemistry Classes".
- Digitally supporting practice oriented parts in master theses.
- Informing teachers about current developments and opportunities in the use of digital media in the classroom.
- Developing and maintaining a website to present the uses of digital media in the classroom as an addition to teacher education and training.

Current structure of the seminar "New Media and Computer use in chemistry lessons"

Try out the Smart Board "Smart Ink". Create a learning module with "Smart Notebook 11." Create a value table with Excel.

Introduction and overview	Presentation of results	Stop-motion videos for visualization of technical content	Create explanatory videos with EE	PowerPoint as a structuring element in the classroom - is that possible?	Information on the use of copyrighted works in schools	Linking laboratory and digital media.
Introduction to the Smart Board	Learning environments for SuS based on PREZI	Try out different apps	Design Learning Paths for SuS with Keynote.	Additional software for the Smart Board	Representation of structures and experimental setups with the PC	Digital measuring instruments for data acquisition and evaluation of experiments
Chemistry and school on the Internet	Try out PREZI	Introduction to using the iPad in the classroom	Create explanatory videos with Explain Everything	Create a WebQuest	Cartoons in the classroom	Future School - How will digital media be integrated in the classroom?
						Graduation and reflection

Document and reflect the various digital media in the learning diary.

Day 1 Day 2 Day 3 Day 4 Day 5 Day 6 Day 7

Stop Motion Videos

- Using stop motion videos, students can dynamically visualize a variety of processes and learn about the basic content they apply.
- One example is the creation of a stop motion video on the nomenclature of alkanes. In doing so, the pupils deal with the rules for chemical naming of substances by creating their own video with the aid of a video tutorial (Fig. 1 and 2).
- In 2017, this idea won the first prize in the "Contest for Digital Learning Objects in Chemistry" by the European Chemistry Thematic Network (ECTN).
- Another idea that has already been implemented is the representation of the diffusion process on a particle level. Random motion is generated with the help of a random generator, which is recorded by the students in a stop motion video and described in parallel using technical terms (Fig. 3 and Fig. 4).

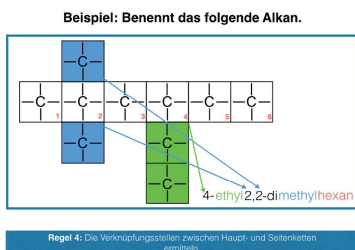


Fig. 1: Shows a part of the video tutorial for naming a chemical compound.

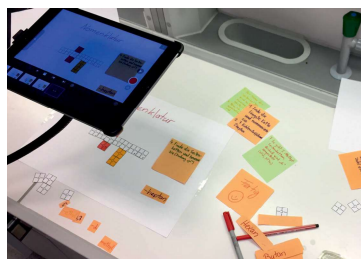


Fig. 2: Shows how to create the stop motion video using the video tutorial.

Current ideas in development:

- KeyNote as a multimedia learning pathway through the properties of alkanes.
- Creating explanatory videos using Explain Everything.
- Using digital measuring instruments in acid-base titration.
- Learning and documenting chemical issues with digital media based on the Johnstone Triangle.



Fig. 3: Shows the process of diffusion of dye particles in a glass.

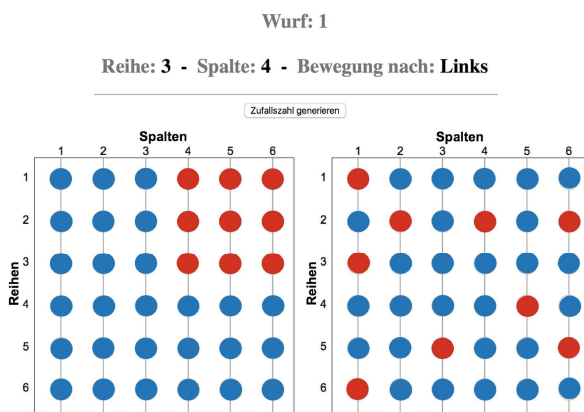


Fig. 4: Shows the simulation of diffusion at the particle level. The random number generator determines the movements of the individual particles on the playing surface.



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Publication:

- Krause, M., Eilks, I. (2017). Learning about the nomenclature of organic compounds by creating stop-motion videos. In: Chemistry in Action, 109, 36-38
- Krause, M., Eilks, I. (2017). Über den Prozess der Diffusion durch Erstellung eines StopMotion-Videos lernen. In: Naturwissenschaften im Unterricht Chemie, 28 (160) (20), 16-18
- Krause, M., Eilks, I. (2018). Wissen in Bewegung setzen. In: Computer & Unterricht 29(109), 18-20.