11th International Conference on Higher Education Advances (HEAd'25)
Universitat Politècnica de València, València, 2025
DOI: https://doi.org/10.4995/HEAd25.2025.19970

A beginner-friendly introduction to the "Concept" lecture series, featuring engaging PowerPoint animations

Anja Pfennig
School of engineering and life science, HTW Berlin, University of Applied Sciences, Wilhelminenhofstr. 75A, 12459 Berlin, Germany.

How to cite: Pfennig, A. (2025). A beginner-friendly introduction to the "Concept" lecture series, featuring engaging PowerPoint animations. In: 11th International Conference on Higher Education Advances (HEAd'25). 17-20 June 2025. https://doi.org/10.4995/HEAd25.2025.19970

Abstract

Lecture videos animated with PowerPoint as audio and visual stimulus cover different learning methodologies and are concurrently implemented in higher education. They are widely used by students in traditional courses and online courses. PowerPoint is a powerful production tool offering a wide range of possibilities to motivational arrangement of digital visualization. The program is widely available, easily accessible, there are multiple open access tutorials and most instructors and students have common knowledge of the program. Using the basic function animated lecture videos (not screencasts which are voice-over slides only!) can be successfully produced by guided student project groups (peer-to-peer approach) as well as instructors.

The concept of producing and implementing PowerPoint lecture videos is introduced with respect to teaching material science to first year engineering students, the special needs of these students, sustainable easy production and implementation in blended teaching scenarios.

Keywords: *lecture films, PowerPoint, making of, peer to peer, material science.*

1. Introduction

The use of lecture videos in universities has increased substantially over the last decade – in both, online and face-to-face courses. Also, the number of students studying mainly guided by online learning material in otherwise traditional courses has increased. The learning materials online students are expected to use vary greatly: (Chen and Thomas, 2020), such as: PowerPoint slides, online/interactive lectures, interactive mind-maps, course templates etc.: (Pfennig, 2023). Lecture videos cover different learning methodologies and generally comprise of screencasts (voice-over PowerPoints), captured lectures (audio or video recordings of lectures) and short animated lecture videos of relevant course material: (Pfennig, 2019).

Most students appraise lecture videos easy to use and effective learning tools: (Kay, 2012) and place significant value on the use of videos: (Gulley, 2016). When students watch lecture videos they not only read to learn, but simultaneously see and hear words and images to understand explanations, thus enhancing retention (Robertson and Flowers, 2020); Mayer 2009). Utilizing multiple senses is beneficial to learning, primarily because students encounter learning more enjoyable and tend to retain more information for longer: (Robertson and Flowers, 2020). Advantages of using instructional videos for foreign learners in inverted classroom teaching scenarios are the improvement of learning autonomy, controlling language deficiencies, avoiding the time and psychological pressure, activation to master new knowledge, motivation and engagement in online learning, learning at own pace, enhance self-directed learning and flexibility of learning and accessing lecture videos at time and space convenience (Bui, 2021). Moreover, the content is made more accessible to students with disabilities or second language students: (Pfennig, 2023; Robertson and Flowers, 2020) conclude that lecture videos lessen requests to lecturers for content clarification and the combination of aids –e.g. PowerPoint (PPT) or lecture notes– provided along with a video give best student learning outcomes.

Most lecturers know how to produce screencasts but rate animated videos difficult and time consuming. However, the latter mostly are the only way of explaining difficult pathways in science where slides or textbooks only provide results. Hence, the purpose of this "how-to" praxis paper is to share more than 10 years of experience to create animated lecture PPT videos. It is neither a scientific research analysis or compares other methods of lecture film production.

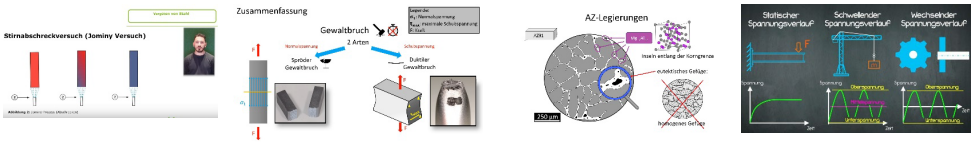
2. Setting of lecture videos using PowerPoint

Depending on pre-knowledge of video production, PowerPoint and the underlying scientific content of the future lecture video it is advantageous to produce lecture videos for content that is not subject to change over at least a medium period. However, to produce PowerPoint lecture videos you do not have to have professional skills or professional technical equipment. Alignment with course learning outcomes, clear content and a well written and understandable script are most viable to the success of lecture videos.

Despite more time and effort for an instructor to create a hand-drawn lecture video than it might take to prepare a narration-over-PowerPoint type of lecture video (screencast with partial or minimal motion) a hand-drawn lecture video results in higher levels of student engagement: (Pfennig; 2019; Pfennig, 2023; Chen and Thomas, 2020).

At HTW Berlin the production of lecture films are content of a voluntary student group semester project where most of the students have little or no film making skills. The procedure of this peer-to-peer approach was introduced by: (Pfennig, 2019) and includes 1. Writing a script/screenplay, 2. Preparation of assets, e.g. illustrations, 3. Text/Voice-over recording´, 4. PowerPoint preparation, 5. Editing and post-production, 6. Finish and delivery. Up to now there

are 71 PPT lecture films readily available on YouTube comprising of different: ppt layouts (Figure 1): https://www.youtube.com/c/Werkstofftechnik-HTWBerlin:



ppt with speaker	ppt with photos	ppt with handdrawn digital assets	ppt with symbols
https://youtu.be/h-kzx5WoY1c	*https://youtu.be/rrkoO2oV4L4*	*https://youtu.be/CzYH4qXVM_g*	*https://youtu.be/zzFY0mGB-E0*

Figure 1. PowerPoint lecture video layouts by HTW Berlin.

Based on our experience PowerPoint lecture videos are suitable for all types of films but show outstanding abilities to produce deep scientific information (Table 1). In general, the choice of the PowerPoint format has to suit 3 boundary conditions: Pfennig (2019), Pfennig (2023):

1. Learning outcome of the lecture (e.g. introduction, overview or precise instruction)
2. Technical support (e.g.: professional director and/or illustrator or artist for sketches)
3. Motivation of student group (own choice works better than instructor suggestions)

Many feedback rounds are necessary until the final version is completed. Figure 2, for example shows the development of visualizing: recrystallization in metals micro structures.

Table 1: Examples of PPT lecture films, playlist, main characteristics and required skills

Theme	URL playlist	Main characteristics	Required skills Illlustr.	Speak.	Cut.	Dir.	Phot.
Mg and Mg alloys	https://www.youtube.com/playlist?list=PLUOlZMSZYz5zL0tdqE7ZNqmB0j1kDMGcN	Digital assets		X	X		
Crystal structures	https://www.youtube.com/playlist?list=PLUOlZMSZYz5xUOfP0o3APbngJ2djip0RH	Hand-drawn assets	X	X	X		
Fracture	https://www.youtube.com/playlist?list=PLUOlZMSZYz5yLhYznb0Az_AV2IXLpvPTF	Integration of photos		X	X		
Ultrasonic testing	https://www.youtube.com/playlist?list=PLUOlZMSZYz5wLXOL12hlWOrL1MIbXfZeS	Coupling of animation and real time movie		X	X		(X)
Annealing of steels	https://www.youtube.com/playlist?list=PLUOlZMSZYz5y_UdFxKzsbkEc7h9stytNH	Smooth quick animation, hand-drawn digitized assets	X	X	X		
Haig diagram	https://www.youtube.com/playlist?list=PLUOlZMSZYz5yyGoklkDIAGnvFh-ayHLdB	Smooth quick animation, hand-drawn digitized assets	X	X	X		
Hardening of steels	https://www.youtube.com/playlist?list=PLUOlZMSZYz5z3wRCqGTbJIZ0gKLVe-uFF	Animated hand drawn assets	X	X	X		
Hardness and Charpy testing	https://www.youtube.com/playlist?list=PLUOlZMSZYz5zKAxQiSnKztPlF-pmhBn7y	Coupling of animation and real time movie		X	X		(X)
Plastic deformation	https://www.youtube.com/playlist?list=PLUOlZMSZYz5y2u0Bhw7UpY4Pa4qCp3cka	Screencast as ppt		X	X		
Recrystallization	https://www.youtube.com/playlist?list=PLUOlZMSZYz5zAaB_frRDs9PeMBnBYnCIu	Screencast as ppt		X	X		

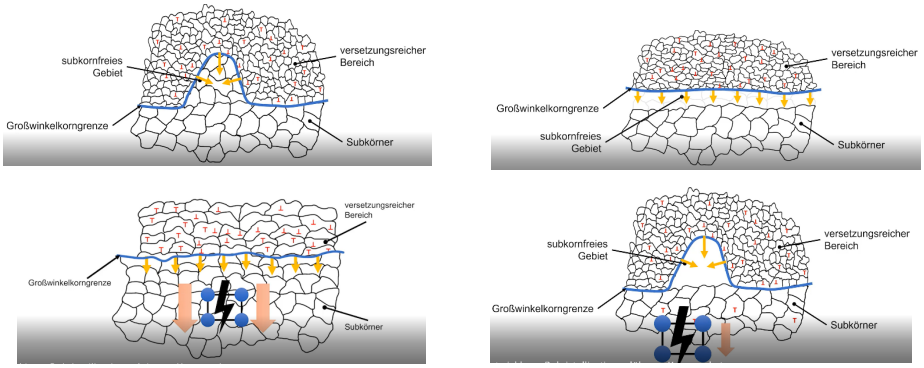


Figure 2. Development: "recrystallization": scientific correctness is inevitable when visualizing.

3. "Concept" of Power Point lecture videos

3.1. Setting of power point

PowerPoint is a versatile program suitable for creating simple animations, such as moving text or images, as well as manipulating graphics and morphing shapes effortlessly. The program allows users to group individual slides, facilitating the organization of multiple slides into scenes based on the script. A group may encompass various scenes, especially when content or animations span several slides.

Each scene can be rendered separately, streamlining post-processing and video editing. This results in individual video files that can be later compiled using editing software. However, a drawback is the substantial one-time effort required to render individual segments. While rendering the entire PowerPoint animation at once reduces this effort, the benefits become apparent during rework. Rendering in sections offers advantages, particularly when addressing imperfections in small portions of a scene. By rendering sections separately, the need to redo the entire PowerPoint animation, including unaffected segments, is avoided. This approach also facilitates the alignment of voice-over with the video, allowing for easy synchronization after each section.

3.2. Treatment and Script

Emphasizing the importance of prioritizing the script over visuals is crucial for successful lecture video production. The script plays a central role as the most pivotal, vulnerable, and flexible element in the entire production process. Post-production changes to recorded text are time-consuming and can disrupt the workflow, potentially impacting student motivation. It is recommended to meticulously craft the script to meet all criteria before acceptance. Encouraging students to see the script as a tool for delivering a podcast promotes clear and precise sentences

without heavy reliance on visuals. Language clarity, shorter sentences, and additional explanations for technical terms are advised. Lecturers should carefully proofread the script, recognizing the significance of each word, as external voice-over artists adhere strictly to the written content. The script includes content, scene setting, embedded texts, drafts of illustrations, and scene duration, aiding students in focusing on the text while providing a rough visualization of scene production. Documenting time while reading aloud helps adhere to the 5-minute limit and prioritize crucial content. As mentioned earlier, groups in Power Point can be used to structure single or multiple scenes. To assign these groups to the correct text sections easier, it is advised to implement a maximum of 2-3 sentences in a scene. This way post-production remains structured in the end.

3.3. Voice over

The text and its content establish the framework and tempo of the film: (Pfennig, 2019). Therefore, it is highly advisable to employ straightforward, concise language and maintain a moderate speaking pace—not too fast or too slow. While hiring a professional voice actor is an option, the authenticity of an enthusiast deeply engaged in the topic can convey genuine sympathy, a key factor in capturing the audience's attention and fostering a willingness to learn.

When recording voiceovers in the studio, consider the following:

1. Prioritize recording before editing to synchronize scenes or animations with the voice-over.
2. Ensure the text printed out for a voice-over recording uses a font size of 16 pt for improved readability, with pauses indicated by blanks.
3. Emphasize understandability over perfection during recording. Utilize a semi-professional plug & play USB large diaphragm microphone like the Rode NT-USB.
4. When selecting a recording room, prioritize minimal reverb and ambient noise. Opt for a relatively small room with carpeting, curtains, upholstered furniture, and possibly soft materials like foam on the walls for sound absorption.

3.4. Production

At the end the video clips from PowerPoint have to be connected and edited to fit the voice-over. To edit films, we use the Adobe Premiere Pro program. It is recommended for professional video editing. If we create more complex animations with the Adobe After Effects program, the programs can be linked to each other. This can save rendering processes, which makes working easier. Even changes are applied automatically. The video editing process can be divided into three parts:

1. First, all raw data is imported and sorted. We distinguish within the editing program in folders whether it is video, audio or animation data.

2. After that, the audio data is loaded into the editing area. Important: always edit the video files to the audio files. This way the video will perfectly match the speech rate. This makes it easier to show exactly what is being talked about.
3. Once the film is edited, it can be rendered for the final time. After that, the film is watched again and again and mistakes are corrected.

4. Evaluation

Students rate the PowerPoint animation lecture videos neither as favorite nor as least choice (Figure 3) compared to other techniques, e.g. swipe, video scribe or slow motion. Therefore, the film format has no significant influence on the "joy of use" and on their learning progress.

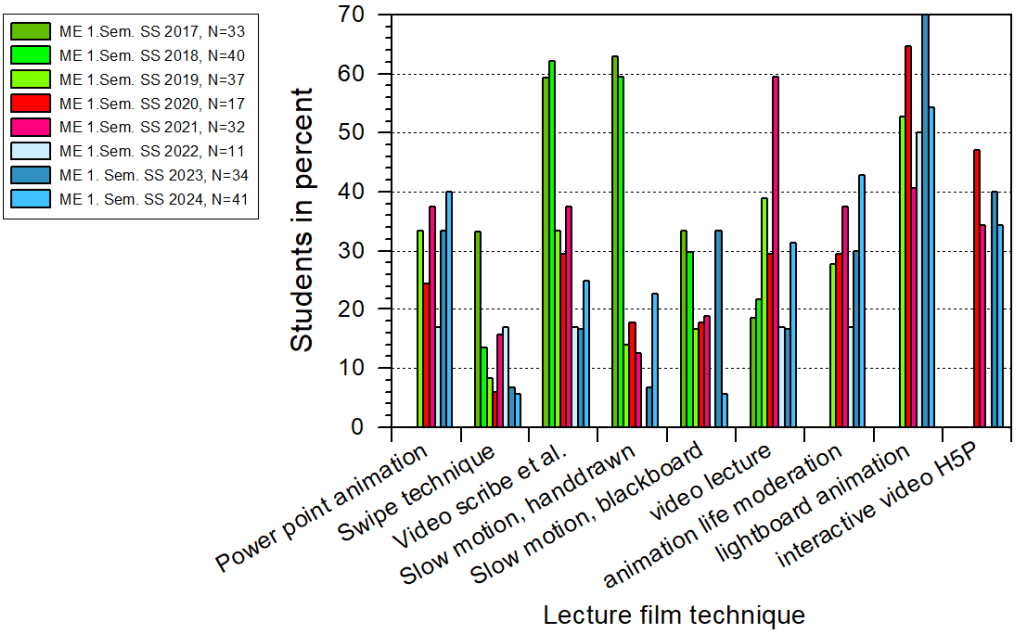


Figure. 3. Preference of video format in material science. (multiple choices were possible).

PowerPoint lecture videos are preferred over screen casts and other digital reading-based learning material such as: lectures or pdf. However, students prefer videos with "human touch" such as lightboard lectures, or hand-drawn slow-motion videos - allowing them to feel directly addressed by the instructor. The combination of interactive online lectures and quizzes with the videos provides a highly appreciated learning environment: Pfennig (2023).

Students working on the lecture films got acquainted with the PowerPoint animation functions rather quickly due to good tutorials (German, HTW Berlin: https://youtu.be/wxq00OpI0Ww).

But, they rated the workload unexpectedly high (mostly because they did not know the importance of a perfect script and because of their high attitude towards good grades resulting in “perfectionism”).

As PowerPoint lecture videos are very common in now-a-days digitalized teaching world one must be aware that this technique does not become overstressed which threatens to bore-out students. In a flipped classroom: (Gordon, Hughes and Smith, 2025) resulted that delivering content through spaced retrieval sessions may offer a new method of teaching that fosters student engagement through interactive learning while reducing the time needed for instructors to create and maintain video lectures. Therefore, a great variety of different teaching materials and the combination of reading, watching and hands-on-problem-solving seem to enhance the individual study progress the most. These findings are supported by: (Kazakov, 2025) who offers a new approach to the lecture process, based on the use of multimedia lectures with an intelligent pedagogical agent in the educational to help improve the effectiveness of training sessions.

5. Conclusion and recommendation from experience

PowerPoint is a versatile tool for creating animations and manipulating graphics effortlessly. PowerPoint lecture videos are low threshold to students due to availability, open access tutorials and common knowledge of the program. Therefore, these videos can be successfully produced by instructors as well as guided student project groups (peer-to-peer approach). PowerPoint allows users to organize slides into scenes based on scripts, with the ability to render each scene separately for streamlined editing. While rendering individual segments requires a one-time effort, the benefits include efficient rework and improved synchronization during post-production, especially when addressing imperfections in specific sections of a scene. The script is most important to guarantee the success of the lecture video in terms of understandability, wording and content. Along with a good voice these provide high stimulation and enhance the learning process. To create successful lecture videos using PowerPoint ppt, consider the following suggestions:

1. Peer-to-peer involvement: Engage students and draw upon their learning experiences to enhance the content.
2. Optimal length: Limit the video duration to 5-7 minutes to maintain viewer engagement and attention.
3. Simplicity: Keep assets, language, and setting simple for effective communication.
4. Screencast/Treatment preparation: Before starting, it is advisable to create a screencast or treatment to illustrate concepts and enhance overall video quality.
5. Meaningful illustrations: Focus on illustrating the meaning of sentences rather than merely emphasizing keywords to promote better understanding among viewers.

Note, that the author would like to recommend cut out animation over PPT animation to display complicated content because PPT requires advanced skills otherwise pauses during filming sequences will slow the lecture video and therefore may negatively influence student learning.

References

Bui, L. (2021). Using Lecture Videos in Flipped Classroom Model. *Advances in Social Science, Education and Humanities Research*, 621, 269-277. 18th International Conference of the Asia Association of Computer-Assisted Language Learning (AsiaCALL–2-2021). DOI: 10.2991/assehr.k.211224.026.

Chen, H.-T.M., Thomas, M. (2020). Effects of lecture video styles on engagement and learning. *Educational Technology Research and Development*. 1-35. DOI: 10.1007/s11423-020-09757-6.

Gordon, L.T.; Hughes, G.; Smith, A. (2025). Modernizing the Flipped Classroom: Replacing Lecture Time With Asynchronous Spaced Retrieval. *Teaching of Psychology*. DOI: 10.1177/00986283251325842.

Gulley, O.D., Jackson, A.L., (2016). A case study on using instructor-recorded videos in an upper level economics course. *International Review of Economics Education*, 23, 28–33.

Kay, R., Kletskin, I. (2012). Evaluating the use of problem-based video podcasts to teach mathematics in higher education. *Computers & Education,* 59, 619–627.

Kazakov, V.G. (2025). Multimedia Lecture with an Intelligent Pedagogical Agent – a New Approach to Organizing Lectures at a University. *Vestnik NSU Series Information Technologies* 22(4), 17-32.DOI: 10.25205/1818-7900-2024-22-4-17-32.

Mayer, R. (2009), *Multimedia Learning* (Cambridge: Cambridge University Press). https://doi.org/10.1017/CBO9780511811678.

Pfennig, A. (2019). "Making of" – Successfully Planning and Implementing peer-to-peer Lecture Films, *PEOPLE: Int. J. of Social Sciences*, 5(1), 795-815, https://dx.doi.org/10.20319/pijss.2019.51.795815.

Pfennig, A. (2023). Getting started - hands-on producing lecture films (Workshop). In: *PROCEEDINGS of the 51st ann. Conf. of the European Society for engineering education – Engin. Educ. for Sustainability SEFI*, 3231-3236. https://doi.org/10.21427/1XWQ-X307.

Robertson, B. and Flowers, M.J. (2020). Determining the impact of lecture videos on student outcomes. *Learning and Teaching,* 13(2), 25–40. doi: 10.3167/latiss.2020.130203.