

Video as a Medium for Learning and Teaching

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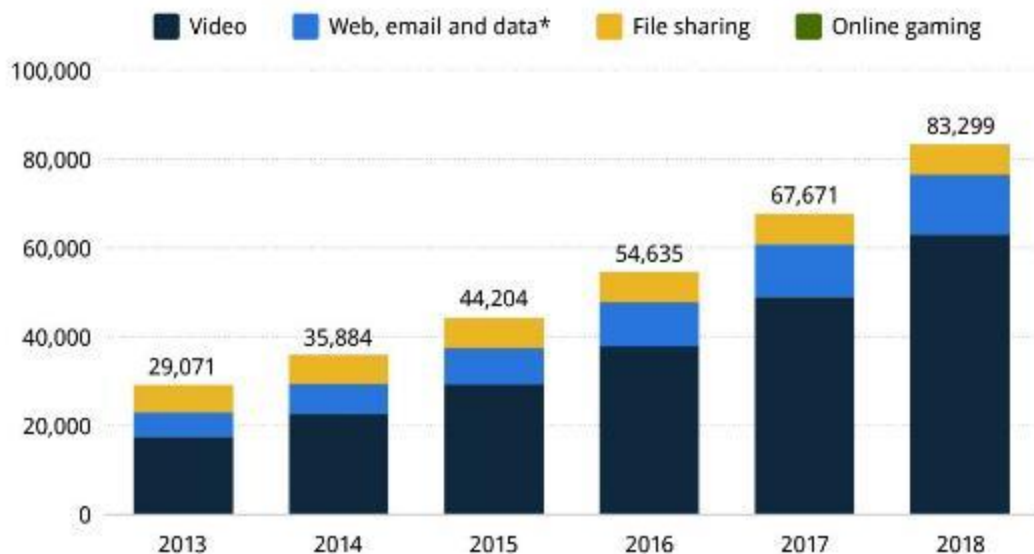


Today there's a keen interest in videos



Online Video To Account For 3/4 of Consumer Internet Traffic by 2018

Estimated monthly consumer internet traffic broken down by type of usage (in petabyte)



* Includes web, email, instant messaging and other non filesharing data transfers via HTTP and FTP

BUSINESS INSIDER

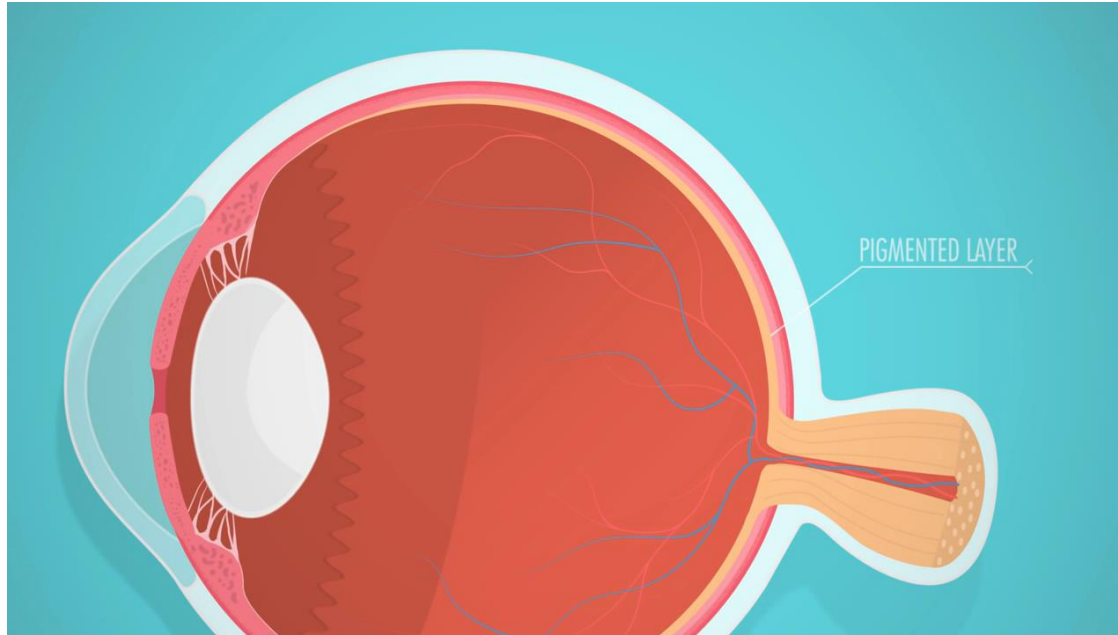
Source: Cisco  

...in the Education field too

- MOOCs
- Education channels



CrashCourse example - Vision



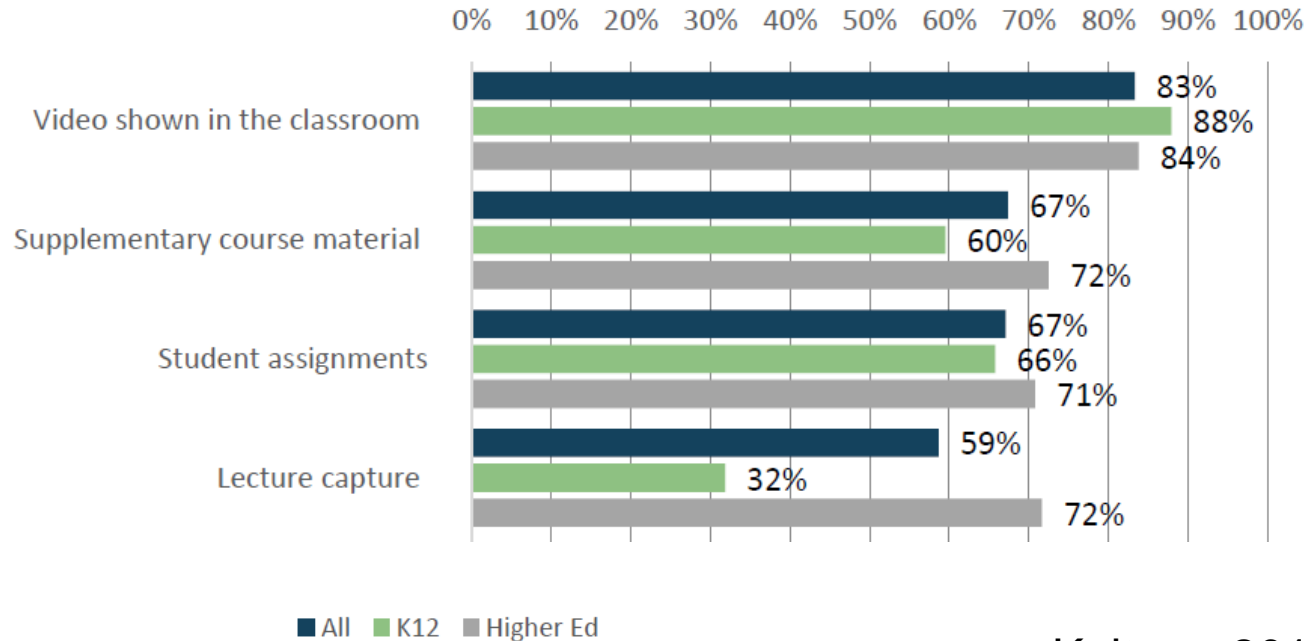
https://www.youtube.com/watch?v=o0DYP-u1rNM&list=PL8dPuuaLjXtOAKed_MxxWBNaPno5h3Zs8&index=18

...in the Education field too

- MOOCs
- Education channels
- Tutorials
- Khan Academy



Video Use Cases



Kaltura, 2015

1) Why use videos in Education Field?

2) When does it facilitates learning?

3) Learning process

4) 5 Guidelines to do an educational video

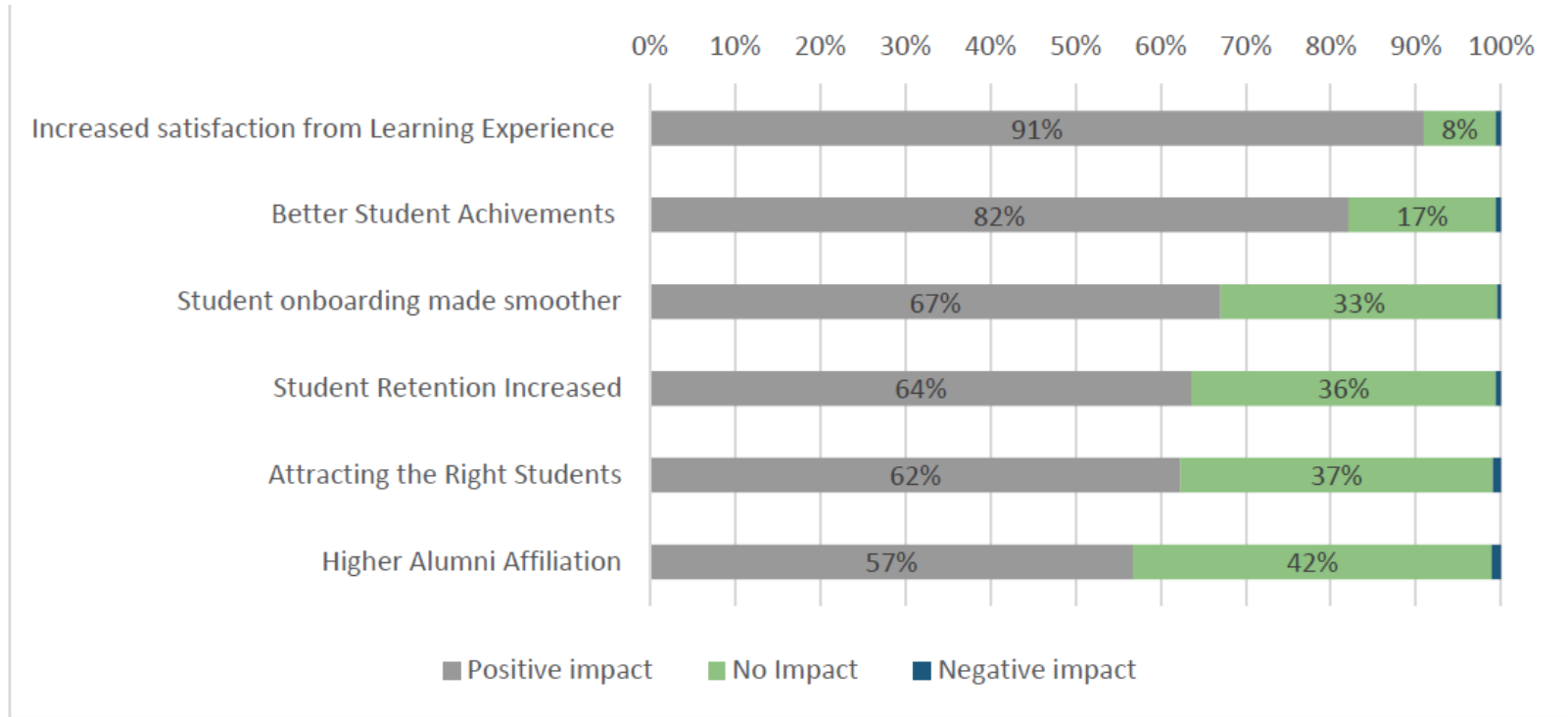
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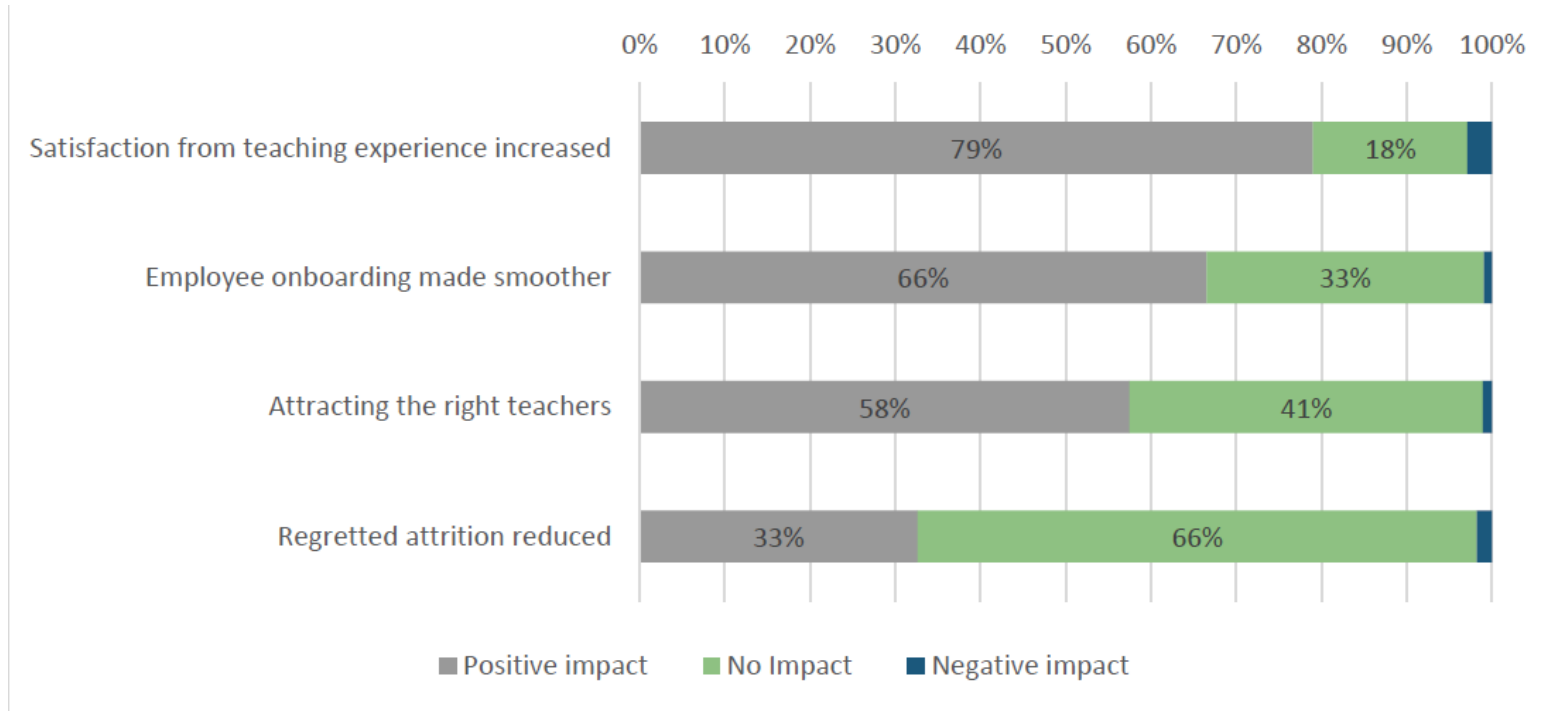
4) 5 Guidelines to do an educationnal video

Impact of videos on students



Kaltura, 2015

Impact of videos on teachers



Kaltura, 2015

Benefits of video over paper

- Multiple modalities
 - Dual coding theory (Clark & Paivio, 1991)
- Easy-to-follow model.
- Congruence
 - Between the screen capture animation and real-life task execution
- More interactive

Van der Meij, 2014

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When videos helps?

Demonstrate

- [Experiments or phenomena](#)
- [Principles involving dynamic change or movement](#)
 - Changes over time through the use of animation, slow-motion, or speeded-up video
- Correct procedures in using tools or equipment (including safety procedures)
 - [CMS underground guiding security video](#)
- Practical activities to be carried out by students, on their own
- ...

Bates, 2016

Limits of the video

- Passive processing
- Limited Pace control
- Don't work with all kind of subjects
- Requires Knowledge and Experience on video making
- Very time-consuming

Negative quotes about video

“It is too often used as a **passive activity**, with no measurement of learning.” (Library staff/Instructional Designer at a small North American K-12 system)

“Most often, video is **misused** and offers no significant improvement to the learning experience. Most students tell us they would rather read the transcripts than sit through a video. **Videos are often too long and full of fluff.**” (Instructional designer at a large North American higher education institution)

“**Boring on video is still boring.**” (Institute management at a small North American K-12 system)

Kaltura, 2015

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Learning Process

“**Learning** is the act of acquiring new, or modifying and reinforcing existing, knowledge, behaviors, skills, etc.”
(Wikipedia)

Learning hinges on interrelated processes of

- Attention
- Retention
- Production

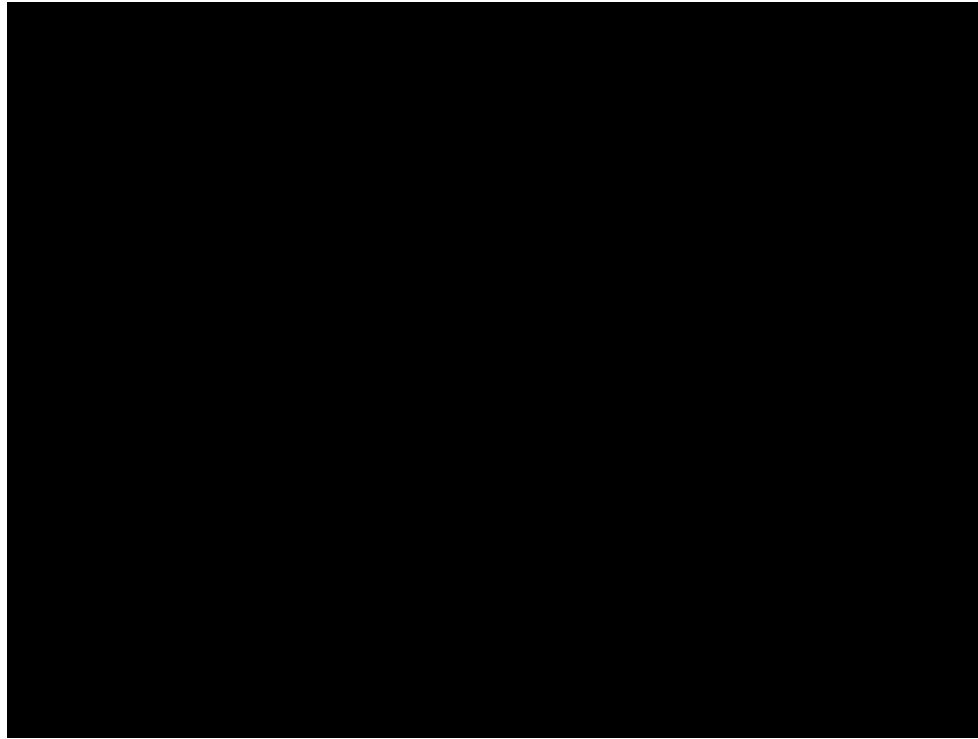
(Bandura, 1986)

Attention

Attention is the process of selectively concentrating on a discrete aspect of information, while ignoring other perceivable information (Anderson, 2010)

- Top-Down Attention
 - Depends on our beliefs, prior knowledge, past experiences
- Bottom-up
 - Cueing or signaling.

Selective Attention example



<https://youtu.be/vJG698U2Mvo>

Attention - Cues and Signals

- Cues (e.g., “On the right hand side ...”),
- Intonation
- Key words

“This could be a question on the final exam!” and everybody stops watching cat funny videos to take note of what follows

Several studies have revealed that users fixate more often and spend more time on cued information (Boucheix and Lowe 2010; de Koning et al. 2010; Kriz and Hegarty 2007)

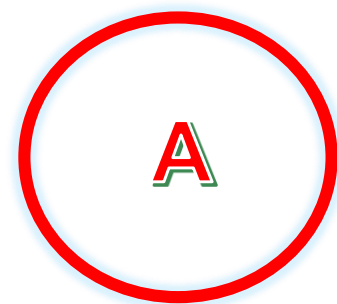
Catching attention on a video

- Features that can affect the selection of attention are:
 - **Color**
 - Sudden appearance
 - Movement
- Perceptible differences
 - Draw a red circle around a key object

Attention - Lets do a test

- What do you see first?

A



Retention

Transform incoming information into symbolic codes that are stored in long-term memory

...In others words...

We take what seems important and we put it in our memory

How do we do this?

2 major processes:

- Organisation
 - by doing a segmentation of the information
- Integration

Organisation

Segmentation involves dividing a continuous animation into smaller units or sections with a beginning and end.

How to do this in a video? (Margulieux et al. 2012; Schwan et al. 2000)

- Titles
- Table of content

[Example 1](#)

[Example 2](#)

Integration

- Synthesizing multiple knowledge models (or representations) into a common model (representation)
- Connect new knowledges to old ones

Requires more or less time depending on each person

- One of the weaknesses of the video compared to paper is the pace control

Integration (II)

How to moderate this problem?

- Add control buttons (Van der Meij, 2014)
- PAUSES (Moreno, 2007)
 - Take 2-5sec of pause after an important point and let the viewer process the information.
 - Reduce mental effort

Production - The ultimate goal

- Production refers to the user's capacity to execute the steps in a procedure correctly so that task completion is accomplished (Bandura, 1986)

It's related to another weakness of the video

- The risk of passive processing

How to avoid passive processing?

- Highlighting
 - Attention and cognitive processing are connected
- Exercises for practice
 - Helps to consolidate and enhance the learning (Ertelt, 2007)

[Example KhanAcademy](#)

Motivation

- The hidden force behind
 - Attention
 - Retention
 - Production
- Process which allows us to start...
- ...and sustain an activity

How to motivate?

- “Foot-in-the-door” technique
 - Candy Crush
 - World of warcraft
 - Etc.
- Simple-to-complex
 - Avoid drop-out

1) Why use videos in Education Field?

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4) Guidelines to do an educationnal video

1. Provide easy access

If we want a video to be watched, it need to be easy to find.

- Choose the title carefully
- Show a brief abstract or summary of the video could enhance its accessibility.

Example

2. Standardize your video

Executive Functions

- Capacities necessary to adapt to new situations, for which there is no ready-made solution
- Requires cognitive resources

Standardize a video release those resources for other tasks...
as learning

2. Standardize your video

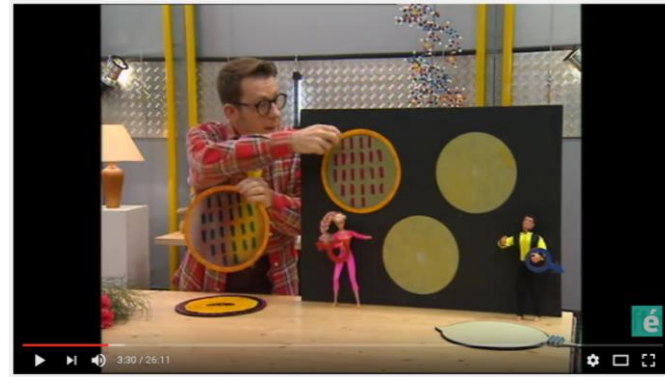
- If you're building an collection, you should build an model and use:
 - Same theme
 - Same structure
- Reduce cognitive load
- There's some [ISO Standards documentation for e-learning](#)

Standardization – Example “C’est pas sorcier”

Fred sees things



Jamy explains them



C’est pas sorcier 1995

Standardization – Example “C’est pas sorcier”

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C’est pas sorcier 2014

3. Enable Functional Interactivity

- Enable User Control
 - User can control the pace of the video



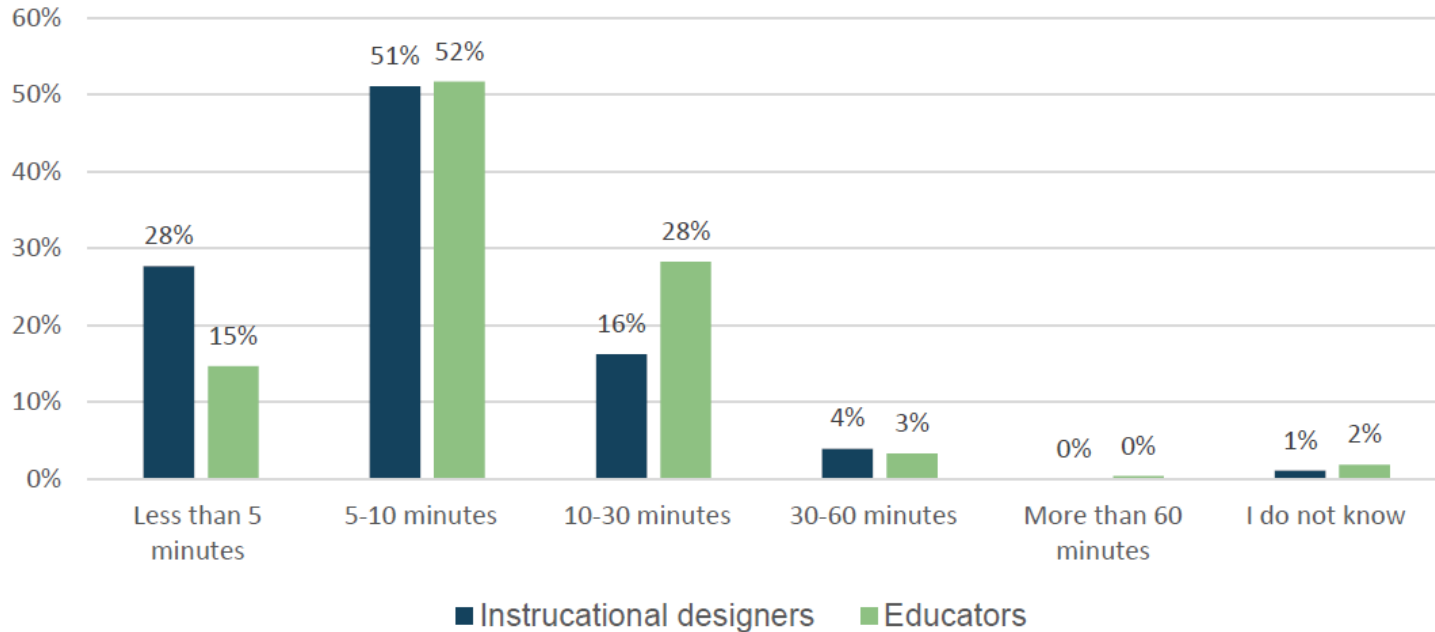
4. Make Tasks Clear and Simple

- Describe an Action Sequence
- Use Highlighting to Signal Screen, Objects or Locations

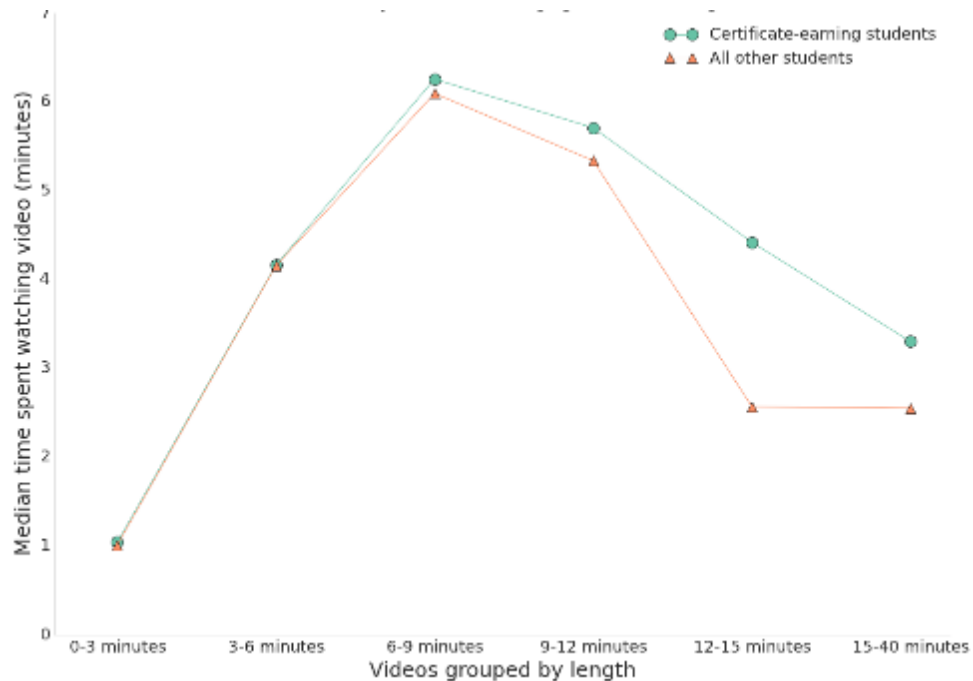
5. Keep video short

- Negative link between video length and effectiveness
- Shorter videos are more engaging. Student engagement levels drop sharply after 6 minutes
- Don't hesitate to cut a theme into several videos

Optimal video length – self-report



Optimal video length



Philip Guo, 2013

Credits

- Maria Dimou – For this opportunity and for helping me prepare this lecture
- Alexandra Theubet – For all the articles about videos
- Tullio (Cern Librarian) – For ISO Standards
- Sebastien Waeger – For making my lecture better and funnier

All the e-learning project group, I learned a lot during my internship here.

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Thank you

