



Theme 2 - Interactive video



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Structure of this theme

- An introductory videoclip and a website example
- Learning objectives
- Introduction: two types of interaction!
- Designing interactive videoclips: design guidelines
- Does interactive video have an impact on learning?
- A checklist to evaluate interactive video
- Your task in line with this theme
- Planning
- Literature references

Learning objectives

After tackling this theme and working out the assignments, you master the following learning objectives:

- Provide a substantiated argumenationt as to why interaction with video has added value.
- Use available knowledge clip and video clips as a basis for the design of an interactive video clip (focusing on either feedback or on processing skills).

- Assess the quality of an interactive video clip based on evidence-based criteria.

An introduction to interactive video and a website to explore



First, watch this video clip about giving feedback. Pay attention to the characteristics of good feedback. You will read more about this later and you will immediately understand why, based on this information, we put forward which criteria we put forward when assessing feedback-oriented videos:

How-to Give Feedback to Students the Right Way



Second, explore this website about tools that can help you make video use more interactive. You will immediately notice that there are many tools and that the importance of interaction is very strongly emphasized. We also use one of those tools further in this theme to add interaction to video clips or knowledge clips in this course:<https://practicaledtech.com/2020/02/24/how-to-create-interactive-videos-three-options/>



How to Create Interactive Videos, Three Options

By [Richard Byrne](#)

This year I've become a big fan of the [PowerCert Animated Videos YouTube channel](#) as the videos on it have helped me explain some important concepts in my Intro to Computer Science courses. Sometimes getting an explanation from someone other than me helps my students understand a concept a little better. Throughout the year I have either shown one of the videos in class or used one in a lesson that distribute through EDpuzzle.

Two types of interaction

Why "interaction" is so important?

In the first theme - you explored the last time - we looked at the development and use of knowledge clips / video clips in an instruction setting. We cited research on the potential positive effects of this form of interaction and communication. But research emphasizes that these positive effects can quickly disappear due to the lack of 'interaction'. Preradovic, Lauc & Panev (2020, p. 207) write the following about this:

Jensen (2008) claimed that linear (demonstration) video promotes apathy rather than stimulating their activity, leaving a student as a passive observer. Interactive video engages learners through their interaction with the material (Kolås, 2015). Interaction is considered desirable because it enhances learning. Therefore, interactive video is increasingly being used for education to increase learners' engagement, interest in course material, motivation, and learning efficiency (Mayer, 2014; Zhang et al., 2006).

This brings us to the core of this second theme: how to promote interaction when passively watching video clips / knowledge clips. In this second theme in the course, we therefore build on the first theme, but now add interaction in two ways.

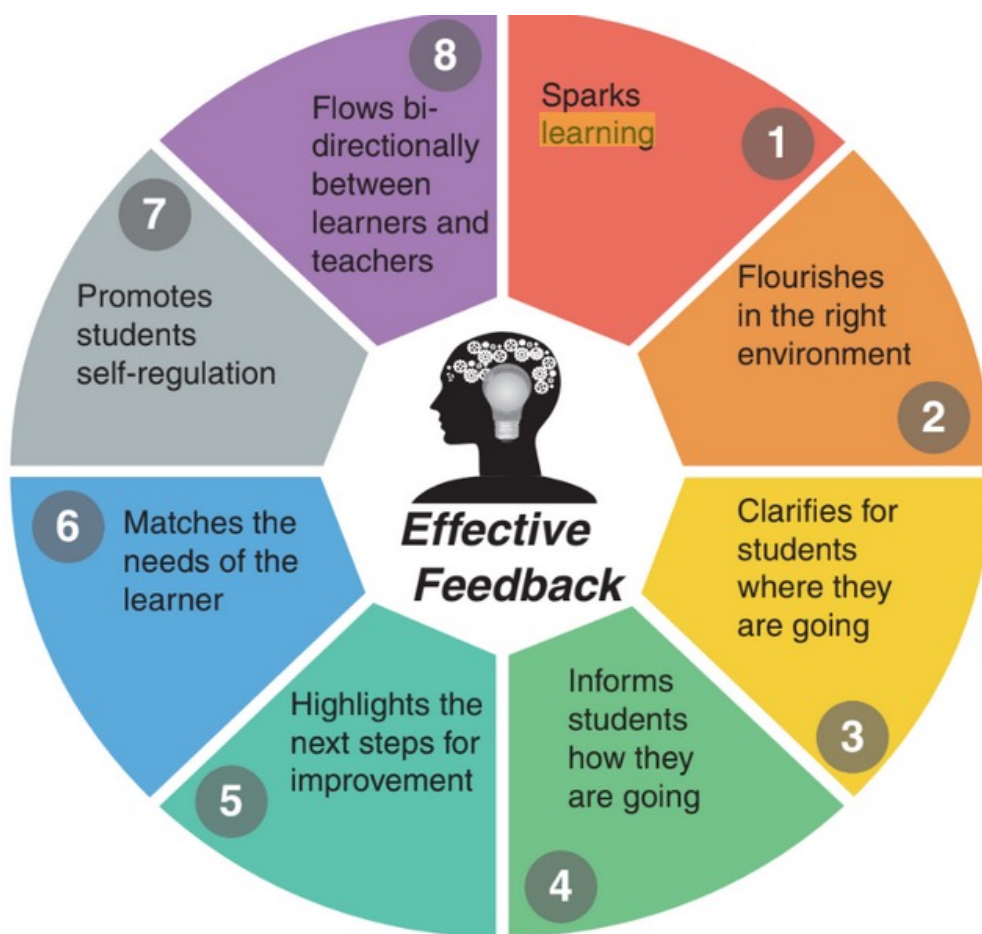
A first perspective: the importance of giving feedback

Research about "what works in education" often falls back on the overview work of Hattie (2009). In his 2015 book on Visible Learning - the role of feedback, Hattie and Clarke (2018, p. 6) zoom in on the role of feedback. On the basis of the meta-analysis of earlier research (see Hattie, 2009), he could already emphasize that whether or not provided with feedback, entails a learning effect of effect size = .75. That means that 50% of the students perform better after receiving feedback. In addition to teachers' views on the value of feedback, he also asks students what they expect from feedback. It is striking that pupils mainly expect feedback to answer their questions about: "Where to go next?". Feedback today has become part of a growing "feedback culture" in which assessment is not an end point of a learning process, but a living part of teachers' learning and instructional approaches. Based on research, Hattie & Clarke (2018) describe the following characteristics of such a feedback culture (2015, p. 8):

- feedback is part of a formative assessment culture;
- tackling mistakes is a 'normal' starting point for learning;
- feedback is focused on the task and not the person;
- the result of giving feedback is not a 'score', but a focus on what you can do now, change, tackle

The emphasis on those characteristics of feedback is not surprising when we consider the criteria that tie in with good feedback. These

are represented by the following figure (Hattie & Clarke, 2018, p. 6):

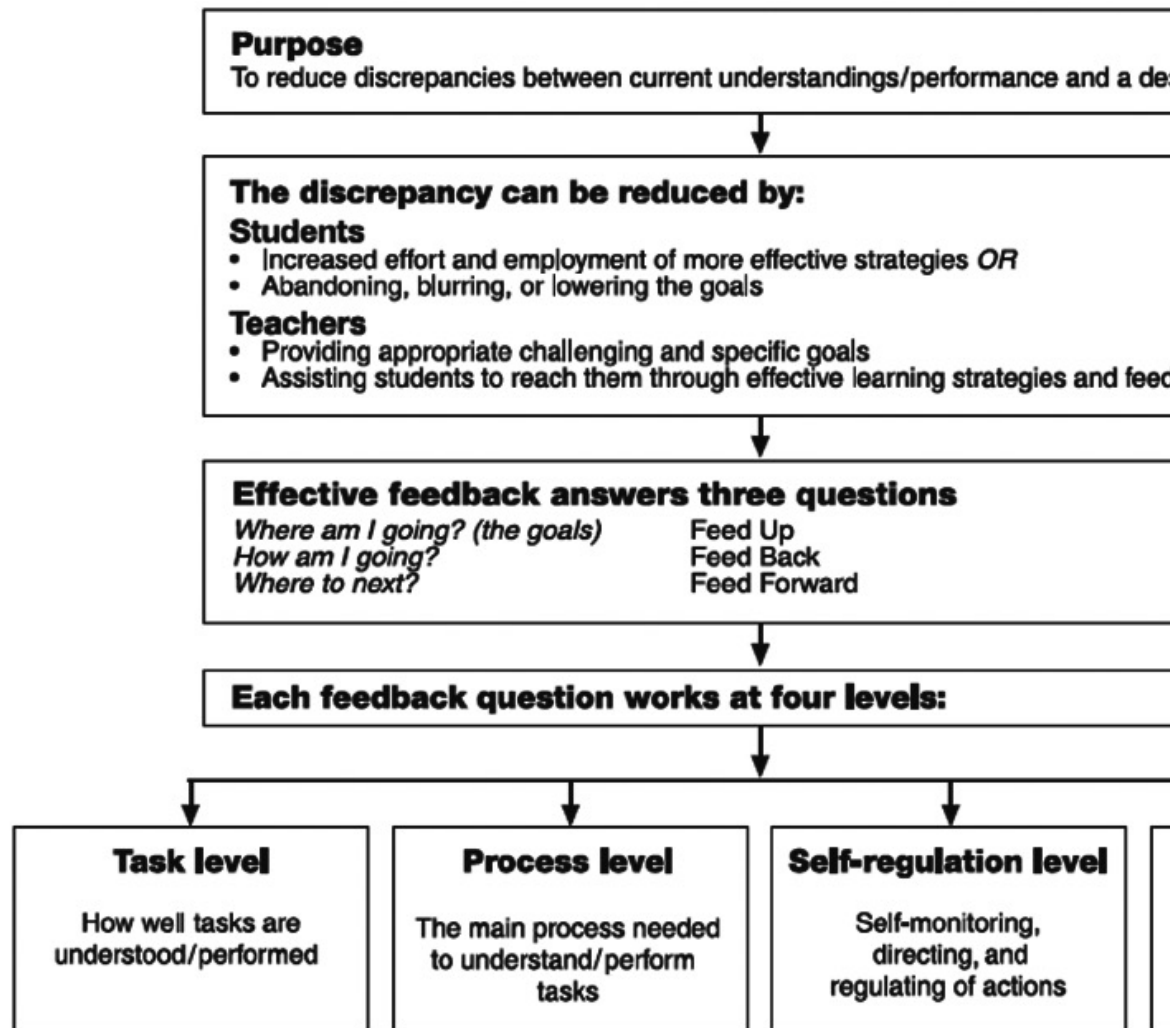


In our checklist we build further on these 8 characteristics of feedback (see below). What we also learn from the literature is that feedback relates to three big questions:

- What have I achieved so far in function of the set learning objectives?
- Did I achieve the learning goals effectively?
- What can I then tackle and / or how can I adjust things?

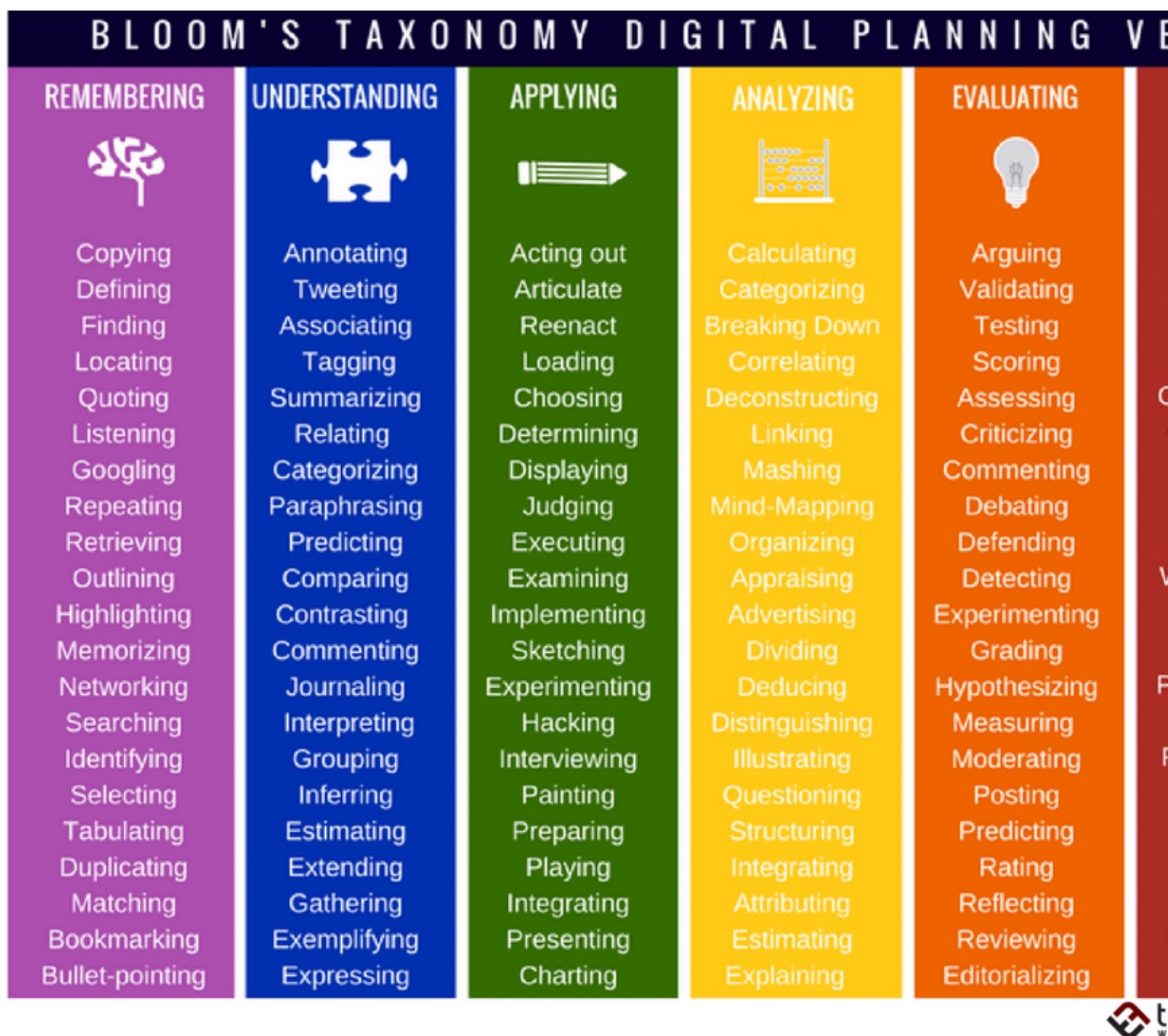
Hattie and Timperley (2007) refer to this as feed up, feed back and feed forward; as you can also deduce from the diagram below. The diagram also shows that the forms of feedback can focus on the task (task), the process followed, the way in which students monitor themselves (self-regulation) and about their person (self level). Research shows that the two strongest forms of feedback address the task and the process. With feedback on self-regulation, a teacher emphasizes the self-evaluation, planning, reflecting, checking in

between, ... If you are interested in the full article about feedback, you can download it here: "[The power of feedback](#)".



A second angle: adding questions

A second way to trigger interaction is to add questions, tasks, assignments ... to the video that students are watching. Immediately you notice that the previously "passive" way of watching the video is broken. Pupils must 'process' the new information. Processing is the keyword that immediately refers to 'cognitive processing'. Such processing processes are very varied: compare, predict, anticipate, deduce, recapitulate, re-translate, choose ... You can look at these verbs from Bloom's taxonomy (see the first theme), where we emphasize that students only learn something 'do' (see <https://www.teachthought.com/critical-thinking/126-blooms-taxonomy-verbs-digital-learning/>).



The addition of questions, tasks, assignments ... provokes behavior that we can classify according to the different behavior levels in the taxonomy. Because this behavior is more than just looking and listening, it is predictable that something else can be learned as well. You will see that in the checklist for this assignment we explicitly refer to Bloom's taxonomy to check whether the questions / comments elicit sufficient strength in cognitive processing. If you want more examples of adequate 'verbs' that fit in with the taxonomy, just type 'Bloom Taxonomy' in your search engine and you will find plenty that might better fit your typical knowledge domain. You might add a search term for your domain: math, physics, history, economy,

art ...

126 Bloom's Taxonomy Verbs For ...
teachthought.com

Blooms Taxonomy Action V...
pinterest.com

Bloom taxonomy: Action verbs and ...
slideshare.net

100+ Bloom's Taxonomy Verbs
teachthought.com

Bloom's Taxonomy Action Verbs
tamug.edu

Blooms Higher Level Verbs | Curriculum | Mesa Co...
mesacc.edu

The Bloom's Taxonomy Verbs
wabisablearning.com



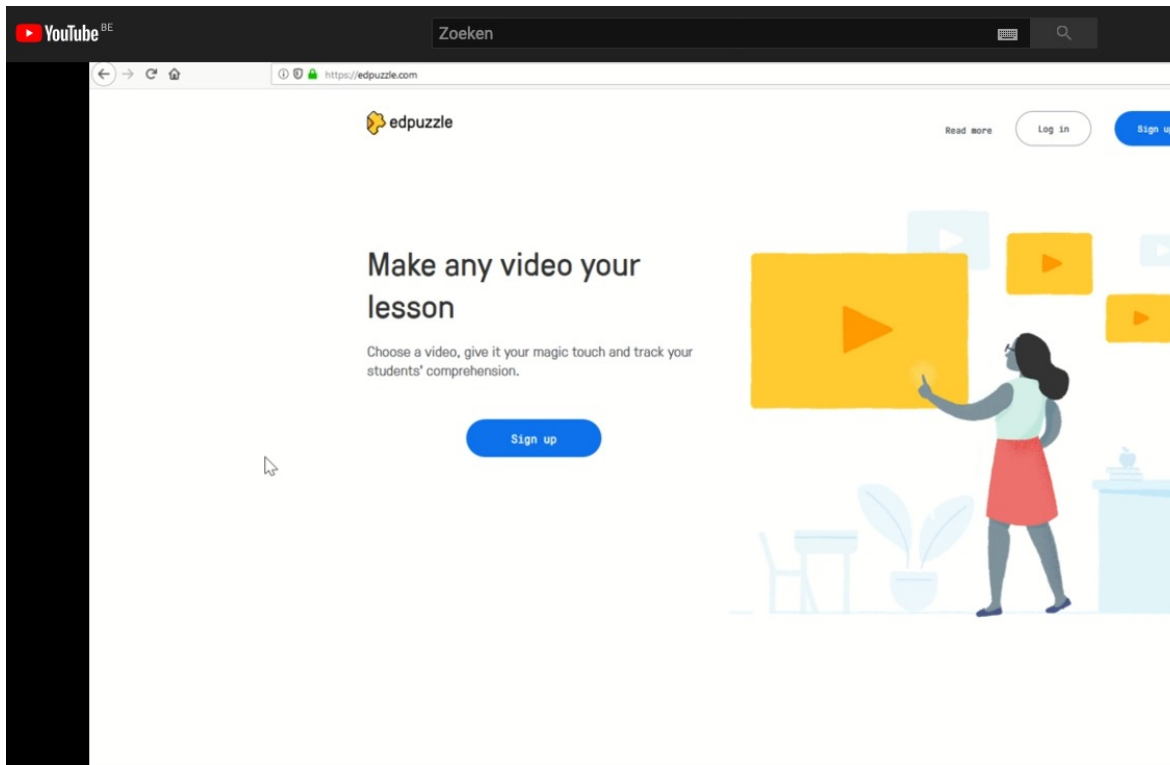
Designing interactive video: design guidelines



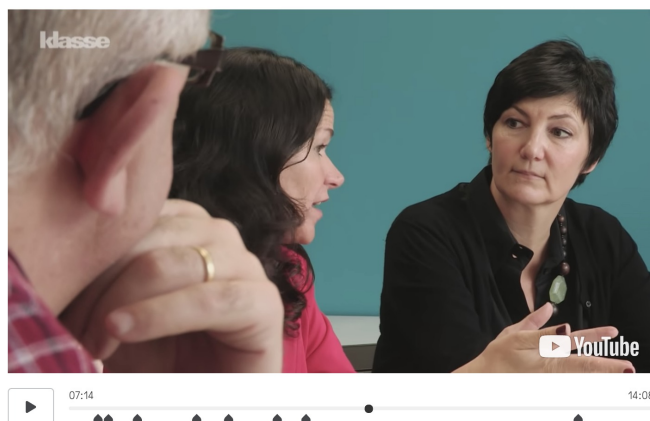
First approach: adding questions to existing knowledge clips / video clips

For this approach we use the Edpuzzle tool in this theme. As an example, you can take a look at the following application of Edpuzzle in which we reused an existing video clip from Klasse for Teachers to analyze teacher training students' approach to teaching. Start by surfing to <https://edpuzzle.com/> and create your own - free - account. Then copy the following link in the website bar:
<https://edpuzzle.com/embed/assignments/58b73a59317cc23e0cb1f1>

[ca/watch](https://www.youtube.com/watch?v=L9h86-UmLyg) You can only watch an Edpuzzle interactive video if you have your own account. When you explore the video clip, you will notice that the video suddenly stops and you have to answer questions. How do you make such an interactive video? This is explained in detail in the following video clip (it would be strange that no video is used in this context): <https://www.youtube.com/watch?v=L9h86-UmLyg>



In the knowledge clip you learn that you can use your own videos or existing video clips to develop an interactive video. You can also add different types of questions to a knowledge clip (open questions or multiple choice) and whether or not to give feedback. But you can also include a note:



- Multiple-choice question
- Open-ended question
- Note

Why add these?

Create questions to see which students understood the lesson, and add notes to give more information or get students' attention with a quick audio note!

It makes little sense to work out a mini-course Edpuzzle here. You can find all instructions online. What we do emphasize is not to create a "class" for the assignment for this theme. You can also simply release an elaborated interactive video "public" (so choose "public links") and then you can copy the link and pass it on to others. Working with a class is of course interesting when you get started with this in your own school and you offer a series of interactive videos to students. You can then immediately have the students' answers entered and, if necessary, retrieve the scores based on the feedback entered. Edpuzzle also includes a testing system and that is super handy.

Assign to a class
Public Links

- Hue University

- leerkracht leerling relatie

- MM_Valcke

Start Date
 Today 12:00am

Due Date
 No due date -----

Prevent Skipping
ⓘ

Turn on CCs
ⓘ

Second approach: give feedback on a video clip sent to you

We use Videoant to provide feedback on a video of others. This tool was developed by the University of Minnesota and is very successful in education. You can view an introduction to Videoant via: <https://youtu.be/1SOE2aQky2I>.

VideoAnt: Getting Started



With Videoant you add annotations to an available video. You can then save that whole - the original video and the annotations - again as a video clip and, for example, return it to the original maker of the video clip. Consider for a moment the following uses in your lessons. You start from a video that your students have given you:


- give feedback on the pronunciation when giving an oral presentation;
- give feedback on volleyball serve;
- provide feedback on a description of the solution to a mathematical theorem;
- feedback when performing a guitar piece;
- feedback during a discussion where the student has to 'convince' another student;
- feedback during a recording of the application of an emergency dressing;
- feedback when preparing a cooking recipe;
- ...

The examples already show that you can get started with video feedback in almost all knowledge domains. To use Videoant you first create a - free - account. When using it you will sometimes receive technical comments (eg that the tool works best with Chrome and Safari and less well with Firefox). You learn to work with Videoant again with ... video. To do this, explore the clips on the following web page: https://ant.umn.edu/video_tutorials. In the screenshot below

you can see, for example, that I am annotating my own introduction clip on this course.

▶ VideoAnt
▶ Martin Valcke ▶ + ▶

▶ intro EIC



▶ YouTube

▶ 0:00 / 2:30 ▶ ▶ ▶ ▶ ▶

AUTHOR DETAILS
 Martin Valcke

There are no annotations for this Ant...

To begin annotating this video:

- 1 Start the video by pressing play
- 2 When you're ready to add an annotation, click ▶
- 3 Fill out the annotation form, then click "Save"

Does interactive video have an impact on learning? ▼

Effect of adding feedback

Above you could already read about the importance of feedback and its effect size ($d = .75$). For inspiration, we would like to refer to a research article in which the addition of video feedback in higher education is investigated. This can already inspire you when viewing your own training (Mahoney, Macfarlane, & Ajjawi, 2019). Because it is a review study, you immediately get a broader view of different


approaches when approaching feedback via video. A striking angle is that the effects are not only examined for pupils / students, but also for the teacher. You will read that giving video-based feedback can save time!

A qualitative synthesis of video feedback in higher education

Paige Mahoney , Susie Macfarlane  & Rola Ajjawi 

Pages 157-179 | Received 10 May 2017, Accepted 26 Apr 2018, Published online: 19 May 2018

 Download citation

 <https://doi.org/10.1080/13562517.2018.1471457>

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 References

 Supplemental

 Citations

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ABSTRACT

While written and audio feedback have been well-examined by researchers, video feedback has received less attention. This review establishes the current state of research into video feedback encompassing three formats: talking head, screencast and combination screencast. Existing research shows that video feedback has a high level of acceptability amongst both staff and students and may help strengthen student-teacher relationships; however, the impact of video feedback on student learning outcomes is yet to be determined. In addition, current evidence is drawn largely from small-scale studies and self-reported data susceptible to the novelty effect. While video feedback appears to be a promising alternative to traditional written feedback for its relative relational richness, the medium continues to be primarily used for information transmission rather than dialogue. Further research is needed to explore how the medium of video influences the feedback process, its potential to facilitate dialogue and its effects on student learning.

As an example of video-based feedback in higher education, we refer to a study in language teaching (English as a foreign language). Özkul and Ortactepe (2017) found that the video-based feedback was more effective than traditional forms of feedback. But if you search a little further via scholar.google.com and type in "video feedback" and learners as search terms, you will find even more examples. A number of striking examples are, for example, about the use of video-based feedback in sports or in music. See the article by [Mahoney, Macfarlane and Ajjawi \(2019\)](#) on the use of video feedback in guitar lessons.

The use of video feedback in teaching process-approach EFL writing

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This experimental study investigated the use of video feedback as an alternative to feedback with written codes at an institution where the latter was commonly used for teaching process-approach English as a second language (EFL) writing. Over a 5-week period, a control and the experimental groups were provided with written feedback based on comments and correction codes and video feedback, respectively, and the extent of their incorporation was analyzed through descriptive statistics. In addition, a questionnaire was administered to the experimental group to explore their perceptions of video feedback. The findings suggest that teacher feedback delivered in the form of video feedback is more effective than written feedback when EFL learners receive feedback on their written work in process writing. The study also suggests that video feedback is more information-rich than written feedback and return results in more correction in learners' subsequent drafts. The findings imply that video feedback is a more effective method of providing EFL learners with feedback and is therefore eligible for classroom use and for future research.

Effect of adding interaction

The same is actually true of adding interaction to video. Hattie (2009) indicates that the use of interactive video is associated with an effect size of $d = .54$. A recent study from 2019 (see Anderson & Davidson, 2019) confirms this meta-analysis in which the researchers compare classic passive video (what they call receptive video) with interactive video viewing. Their research examines the brain functions related to


learning. And their conclusions therefore emphasize the different types of learning goals that are achieved with receptive versus interactive video viewing (ibid, p. 168): "We suggest that overt responding to interactive demands requires highly focused attention and enhances stimulus-response-goal. associative learning at the expense of learning about temporal and spatial context. Receptive and interactive screen media, therefore, enhance different types of comprehension and learning. ". So if you want to achieve more with your learning goals than developing an initial knowledge base about new learning content (Bloom would call this memorization and understanding), then it is better to add interactively to the viewing of the video clips. Only then do you reach behavioral levels in the learning goals with regard to application, analysis, evaluation ... This research immediately emphasizes the attention that you as a teacher must have for the learning goals that you want to achieve when using this technology.

The approach that we put forward in this theme is also evidence-based: adding questions to a video clip appears to have a clear learning effect. Explore this [research article](#) on adding questions to a video clip:

Journal of Science Education and Technology
<https://doi.org/10.1007/s10956-020-09847-3>

Pop-up Questions Within Educational Videos: Effects on Students' Learning



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Abstract

Educational videos are increasingly used to let students prepare lesson material at home prior to in-class activities in flipped classrooms. The main challenge of this teaching strategy is to stimulate students to watch these videos attentively before going to class. This paper describes the use of questions that pop-up within relatively long educational videos of 16 min on average and designed to enhance students' engagement and understanding when preparing for in-class activities. The effects of such pop-up questions on students' learning performance were studied within a flipped course in molecular biology. Students had access to videos with or without a variable set of pop-up questions. The experimental group with pop-up questions showed significantly higher test results compared to the group without pop-up questions. Interestingly, students that answered pop-up questions on certain concepts did not score better on items testing these specific concepts than the control group. These results suggest that merely the presence of pop-up questions enhances students' learning. Additional data from interviews, surveys, and learning analytics suggest that pop-up questions influence viewing behavior, likely by promoting engagement. It is concluded that pop-up questions stimulate learning when studying videos outside class through an indirect testing effect.

Keywords Interactive video · Pop-up questions · Flipped classroom · Testing effect · Molecular biology · Undergraduate

Don't forget that by adding targeted questions to a video clip, you can also immediately lay the foundation for a different assessment approach: assessments based on interactive video. You can read this in the conference contribution of [Blackstock and colleagues \(2018\)](#). Click on the author's name and you can immediately read the article online. As a teaser, we give you the table with the estimated learning effects by the students involved:

Question	No Gain
Increased confidence that you understand the material	1%
Increased your learning in this course	1%
Increased your understanding of how ideas from this video relate to ideas encountered in the course	3%
Increase your understanding of how ideas encountered in the course relate to helping people address real world issues	3%
Increased your ability to remember the content covered in the video	3%
Increased your ability to connect key class ideas with other knowledge	4%

You notice that the learning effect relates to different forms of "cognitive processing".



A checklist to evaluate interactive video



A checklist for assessing video clip interaction

As with the first theme, we provide a checklist that you can use to assess interaction with knowledge clips / video clips.

Again, you will use a specific checklist for the assignment that we explain below. The checklist consists of two parts. Of course you only use the part that matches the type of the assignment for which you provide feedback and with which you have received feedback. You notice that you can add your own feedback criterion of your choice in each version of the checklist.

Download the checklist here: [Feedback_interactive_video_EICb.docx](#)

Checklist for option 1

Criterion	Feedback	Fe
	Participant giving	
OPTION 1 ADDING FEEDBACK TO A VIDEO		
Is there a clear focus on a specific learning objective?		
Observable and therefore concrete criteria are used when giving the feedback?		
Is the emphasis on the extent to which the students are doing well (feed up)?		
Is the emphasis on providing information / indicators that emphasize the control of a criterion or learning objectives (feedback)?		
Is the emphasis on how students can get started again (feed forward)?		
Is the emphasis sufficiently on the task?		
Is the emphasis sufficiently on the process?		
Is the emphasis on the student's self-regulation?		
Add your own criterion		

Checklist for option 2

Criterion	Feedback	Fe
	Participant giving	
OPTION 2 ADDING INTERACTION TO A VIDEO		
Is there a clear focus on a specific learning objective (eg by adding a note to the video presented)?		
Do the questions, tasks, comments lead to cognitive processing at a higher behavioral level in Bloom's taxonomy?		
Is there any feedback provided on input from students responding to or answering to the tasks / questions / assignments?		
Is there attention for types of feedback in the input of the students in the questions / tasks? Feedback, feed up, feed forward?		
Is there a decent spread of questions / tasks / assignments / notes throughout the video clip / knowledge clip?		
Add your own criterion		



Task in line with this theme



You get two options

Option 1

The starting point for this option is the video clip / knowledge clip that a colleague of your group has made and uploaded into the locker of your group. You can choose which video clip to tackle. With this video clip you develop feedback with the Videoant tool (<https://ant.umn.edu/myantfarm>).

Pay attention to the criteria in the checklist when giving feedback. And of course you can also use the checklist from the first theme as a basis for your feedback. You can then upload the new video clip or a link to the video clip in your locker.

Option 2

The starting point for this second option is an existing video clip / knowledge clip that you can choose freely. It is best to assume a video that is relevant for your university/college courses. The aim is to redesign this knowledge clip / video clip into an interactive video clip by adding questions / tasks / assignments / notes with the Edpuzzle tool (<https://edpuzzle.com/>).

Planning

- Deadline to upload your feedback videoclip: XXXX
- Deadline to upload your feedback and feed forward for one colleague: YYY
- Deadline for uploading your feedback to the feedback having received: ZZZ

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