

## *Videos in the Language Classroom As Learning Mediators*

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The European Conference on Language Learning 2023  
Official Conference Proceedings

### **Abstract**

The inclusion of videos in teaching has become widespread in the last decades. The paper faces the question of whether this practice should be considered beneficial to learning in any case, due to the attractiveness of audio-visual resources. Studies in cognitive psychology offer a complex answer: on the one hand, the double channel - sight and hearing - is a motivating device; on the other hand, the exposure to the two language codes, images and commentary, may cause cognitive overload in working memory, hindering long-term meaningful retrieval. Examples from the author's experiences of teaching English as a second language to undergraduates show how a teacher may endeavour to emphasise the attractiveness of the medium and, at the same time, reduce or even avoid memory shortcomings. To ensure beneficial effects, criteria to follow when choosing a video are underlined, as the overall consistency between the visual and the verbal codes. To weaken the critical effects, attention is drawn on the following aspects: the role of videos to activate or create learners' cognitive and language 'schema' before approaching a new topic; the selection of comprehension strategies according to the educational objective, rather than a thorough understanding of the video clip. The paper concludes focusing on the need for learners to be aware of the rationale behind both the choice of video clips and of comprehension strategies, in order to encourage autonomous learning in an academic context, as well as in everyday life.

Keywords: Video Clip, Dual-Coding Theory, Cognitive Load, 'Schema', Autonomous Learning

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## Introduction

The inclusion of a video in a classroom activity can initially be a motivating resource that, thanks to its variety, attractiveness and flexibility, makes the class daily routine exciting for both students and teachers. The emphasis is also on the teacher's motivation, which is among the pre-requisites in the educational process: satisfaction for the chosen video and pleasure to perceive the students' curiosity about it are only some of the teacher's feelings that are likely to produce a positive repercussion on the students. However, the favourable aspects characterising the initial phase of a learning process do not guarantee the final results. The present paper faces the question of whether, with second-language university students at a B2 level and beyond, the practice of incorporating videos into the daily educational work should be considered beneficial to learning no matter what, due to the intrinsic appeal of audio-visual resources. Besides, it also draws attention on the fact that the valuable use of a video involves awareness of the students' comprehension process with ensuing preparatory work for a teacher.

The paper opens with a survey on selected literature regarding significant experiences of the use of videos for second language learning. Subsequently, it continues with an overview of the main studies in cognitive psychology to account for both a favourable and a critical response of learners to video resources: "dual-coding theory" (Paivio, 1969), "cognitive load" (Sweller, 1988), consequences and remedies (Chandler & Sweller, 1991; Mayer & Moreno, 2003). In order to find a balance between the two opposite views, the favourable and critical ones, evidence is given to the fact that videos can be used to activate pre-knowledge, to facilitate the approach to a new topic. Besides, if previous knowledge is not yet available in a student's long-term memory, a video can be employed to generate it and promote later learning.

## Empirical Studies on Videos in the Classroom

Before 2005, the year that marked the advent of YouTube, the novelty within the field of audio-visuals consisted in the use of CDs, DVDs and recordings on VHS cassettes of broadcasts from satellite TV, like interviews and the news (Di Nisio: 2002). Since 2005, the net has gradually become a huge repository where to select the right resource for the right addressee, YouTube playing a pervasive role in the life of "digital natives" (Prensky: 2001). A short chronological review of empirical studies on the use of videos in teaching, language courses included, follows.

In his study about how language learners respond to digital video media, Gruba (2004) refers to the use of news broadcasts recorded from satellite television. His analysis draws on a constructivist view of the process that goes on while watching a videotext: comprehension is seen as an inner act of "constructing, and revising hypotheses gained through experience in the world [...]" (53). Among various theorists, he recalls concepts regarding text comprehension, such as *schema*, *frames*, *scripts* and *macrostructures* (Minsky, 1975; Schank and Abelson, 1977), which allow for the selection of complex data, the organisation of information, ultimately the construction of new meanings.

Bonk (2008) sees the use of a video as a way to "anchor" instruction: "the videos provide a macrocontext [...] a learning space that can be replayed or revisited and discussed from many perspectives and over an extended period of time". In this way a video becomes an "advance organiser" (Ausubel, 1963), which suggests that new input can be meaningful through the mediation of an audio-video text, if it is related to long-term memory.

Berk's (2009) article is an enlightening companion for a language teacher who is oriented towards the use of videos: it includes a list of "20 potential outcomes to ponder, like improving the students' attention, understanding, collaboration, mood or tone" (2). To account for the favourable influence of double-channel materials on language learning, thanks to the ensuing activation of the student's potentials, Berk focuses on how the learner's brain responds when watching a video, offering a rich overview of previous studies (2-4): Gardner's (1983) multiple intelligences, thanks to the verbal, the visual and the musical dimension of a video; Goleman's (1998) emotional intelligence, including the intrapersonal and the interpersonal, the former through "self-reflection [...] planning [...] and metacognition", the latter through various forms of interaction in classroom group activities; Sperry's (1973) theory of the right and left hemisphere, each spurring different ways of thinking; Millbower's (2000) "brain wave frequencies", according to which videos produce those waves that keep the student's state of awareness in the best conditions to comprehend and learn; Paivio's (1986) and Mayer's (2001) studies on the mental processes implied in the use of multiple channels.

Through their review of research studies on captioning in short videos, Montero et al. (2014) demonstrate that full captions with and without highlighted key words, as well as captions with key words only, all seem to produce a better comprehension performance in the second-language experimental group, as well as vocabulary retention. They also report about studies according to which this beneficial outcome is possible only with advanced-level students (118-120).

Costly et al. (2021) give an overview of studies on strategies, maintaining that "watching videos from start to finish may not be the best way for students to learn content." (22). Just watching a video has no magic influence on a learner per se, but it involves control over viewing strategies to mediate comprehension and data processing: as reading may require skimming or scanning, viewing necessitates specific strategies geared to comprehension tasks (24-33). The authors also list digital actions that should make "learner-controlled pacing" possible, like "pausing, repeating, accelerating, and decelerating while viewing a video" (22).

Teng (2021)'s book is devoted completely to the exploration of the use of captions in videos, from short YouTube clips to films. It underlines their usefulness, thanks to the reduced comprehension load on a second-language learner and the consequent positive repercussion on short and long-term memory, focusing not just on single word retention, but also on the acquisition of "multi-word units" (82), including collocation, register and formulaic language, together with chunking abilities (21). It also considers incidental vocabulary learning that occurs aside intentional-learning activities (5-8).

The studies that have been mentioned are far from giving full evidence of the attention that has been given to the growing role of videos in the classroom across all subjects. Still, the selection suggests the need for language teachers to be aware of favourable and critical implications stemming from the use of videos and of the need for strategic control over their inclusion in the educational syllabus.

### **Dual-Coding Theory and Cognitive Load**

What follows is a short and chronological overview of studies about the adoption of multimedia resources in education. To prove the weakness of the widespread belief according to which videos in the classroom are good regardless, advantages and disadvantages are mentioned.

Paivio (1969) started reflecting on how human cognition processes stimuli when two mental channels are activated, one dealing with the nonverbal and the other one with the verbal: the “dual-coding theory” was developed and assessed. The initial belief was that the coexistence of the two channels should promote better understanding, storage and retrieval of the data.

The research on the dual-coding theory continued for decades, highlighting the challenges of the inclusion of videos in education. Considering that working memory is characterised by short-term and limited cognitive capacity during the comprehension process, while long-term memory refers to information retention beyond the act of comprehension and tends to last in time, Sweller (1988) elaborated on the risk present in multimedia learning of dealing inadequately with the two main types of memory, producing high “cognitive load”. Years later, the cognitive load that encourages or inhibits learning was described (Sweller, 2010; de Jong, 2010; Paas & Sweller, 2014) according to the following categories: “intrinsic”, the cognitive load of the subject matter to be learned with its degree of difficulty, which varies according to the number and nature of simultaneously interacting elements; “extraneous”, the cognitive load caused by inappropriate or nonessential instructional material used to accompany the main topic; “germane”, the load of the learning process that is activated to promote learning in interaction with “intrinsic” load. In education, cognitive load requires careful management not to overload working memory, which would be detrimental to the learning outcomes: “intrinsic” and “germane” categories should be reinforced against the confusing and disorienting role of “extraneous” load.

Chandler & Sweller (1991) underlined the fact that, rather than facilitating comprehension, a combination of verbal and nonverbal communication may obstruct it, producing cognitive load if not adequately handled: the idea is that both media should be carefully restructured into an integrated format (331). Sweller & al. (1995) continued the investigation on how to reduce cognitive load, considering the constraints of the simultaneous use of both systems on working memory capacity. Their suggestion was that information of the two types, the verbal and nonverbal, should be processed separately, rather than in one system.

Mayer & Moreno (1998) elaborated on the concept of the “split-attention principle”, which refers to the situation when information from multimedia sources is not well integrated, causing the learner’s double effort to follow images and commentary at the same time. Mayer et al. (2001) focused the analysis of the learner’s cognitive constraints due to a lack of consistency between the various channels, which would make learners split their attention between the different channels, missing relevant data in the text. While accepting the learning advantages embedded in Paivio’s (2014) “dual-coding theory”, Mayer & Moreno (2003) went deeper into the concept of cognitive overload. When stimuli from a multimedia resource may exceed the human capacity to retain information through working memory, they suggested various adjustments aimed to increase the inner coherence of the presentation, while enhancing the learning process: “Segmenting”, “Weeding” and “Eliminating redundancy” (46). Mayer (2014: 43-44) believed that learning is more effective and meaningful if both words and pictures are presented together, which should foster the success of a “multimedia instructional message”, when applied to classroom communication. To explain how information is processed in the learner’s mind, he produced a cognitive model of multimedia learning: a “multimedia presentation” triggers “sensory memory” through ears and eyes and reaches the “working memory” through three main cognitive acts, first “selecting” what is relevant according to the focus, then “organizing” it in a coherent way, and finally “integrating” the result with pre-existing knowledge, which, thanks to its meaningfulness, permits “long-term memory” (52-57). For the process to be successful, the psychologist stated that learners must be motivated to

learn and aware of the cognitive steps to have control over them (65): the two components, motivation and metacognition, were incorporated into what was considered the evolution of his cognitive model.

To conclude, the practice of multimedia per se cannot be seen as the panacea to face teaching and learning issues. The dynamics is still very complex, as is summarised by Hede (2002): “The independent variable in the overall model is learner style and the dependent variable is learning. The remaining variables are either intervening or moderating or both, namely, visual input, auditory input, learner control, attention, working memory, long-term storage, motivation, cognitive engagement, intelligence and reflection.” (187). The complexity of the process requires researchers’ attention to old and new issues in the field of educational psychology, especially considering the on-going technological progress.

### **Reducing Cognitive Load Through ‘Schemata’: Some Teaching Experiences**

The experiences regarding the inclusion of videos the author is going to present took place in a degree course in foreign languages and literature with first-year and second-year undergraduates, the former at a B2 level of English and the latter beyond the B2 level of the same language. The presence of double-channel materials in class activities was exploited for various aims: besides offering motivating materials, potentially able to stir the students’ attention, most importantly the intention was to add a preparatory and promising initial step in the learning path.

The author’s language teaching experiences that are recalled in this section started with a careful choice of videos. The criteria that were followed included: the reliability of the video, the consistency between the verbal and nonverbal components, the short duration, the clarity of the speaker’s voice and the variety of the speaker’s age, accent and working status. As a matter of fact, videos often included presentations with young university researchers or young staff in language institutions: they may have recorded their presentations in informal places, like their bedrooms, or back gardens, they may have dropped some casual comments on the high temperature of the day or on the low battery of their recorders, at the same time safeguarding the high quality of their presentations. Of course, no matter whether they were not young any longer, linguists and academics with renowned competence were not excluded.

The features of the video, like its attractiveness and short duration, made it easy to approach and process it; the frequent return to its content during the various stages of the learning path encouraged a quick shift from sensory and working memory to long-term memory; the meaningfulness of its message turned the video into a landmark to go back to during the whole learning path and beyond, to highlight its overall content or its specific details. If thoughtfully chosen, a video would always draw the students’ attention: it was possible to detect how involved they soon got from the change in their postures, their eye movements and other non-verbal signals.

The viewing procedure usually started from the students watching a video for the first time without any structured task from the teacher, not to spoil their first impact through performance anxiety. As a second step, the teacher would provide students with questions implying a top-down or a bottom-up approach to the video, according to the objective, avoiding either an unstructured or a detailed request aimed at full comprehension. In so doing, students would direct their attention only to the overall message or focus it on selected aspects. Repeated viewing would be allowed according to their needs. At times, students were given different

videos to share comprehension with their class mates in pairs or groups. In this case, they could play the video according to their personal pace, stopping, rewinding, repeating, slowing the speed and reading the captions, if necessary. The teacher's presentation of the matter was given at the end of the whole comprehension path, as a wind-up final step the students could make sense of in the light of the previous comprehension activities.

The focus in each experience was on the initial stage of a comprehension process, when the learner is more likely to suffer from memory overloading: in this phase, a video became a means to trigger pre-knowledge in preparation for the study of a new topic from the syllabus. Bartlett (1932) was the first to theorise that, when exposed to new input, the human being activates a network of mental preexisting knowledge, called "schema", which promotes understanding through its own data; Rumelhart (1980) defined a "schema" as a "skeleton around which the situation is interpreted" (37). The examples of language teaching experiences based on the utilization of video clips indicate the centrality of the concept of "schema" (Bartlett, 1932; Rumelhart, 1980) to reduce the cognitive load in two different ways: activation of pre-knowledge, when it existed, or processing of new input, which, in the following learning stage, would become pre-knowledge to activate. Both cases were meant to assist comprehension of a new topic, the "intrinsic" (Sweller, 2010; de Jong, 2010; Paas & Sweller, 2014) cognitive load, through the "schema" (Bartlett, 1932; Rumelhart, 1980) strategy, the "germane" cognitive load.

The first three experiences took place with first-year undergraduates at a B2 level. The syllabus topics dealt with the main areas of linguistics included in a course textbook (Winkler, 2012). Serving the function of helpful "germane" cognitive load, videos were used before approaching a new chapter or its section, the "intrinsic" (Sweller, 2010; de Jong, 2010; Paas & Sweller, 2014) cognitive load in the comprehension phase.

The first experience had the objective of building the "schema" (Bartlett, 1932; Rumelhart, 1980) necessary to understand the chapter on phonetics and phonology (Winkler, 2012: 83-108), since the difference between the two areas of speech sounds were new to the students. The YouTube videos contained short clips of films drawn on Bernard Shaw's *Pygmalion*. The first one<sup>1</sup> showed the famous scene in which Professor Higgins teaches Eliza how to pronounce the aspirated h-sound in the sentence "In Hartford, Hereford, and Hampshire, hurricanes hardly ever happen". Through its auditory and visual enactment, the episode offered a conceptual example of phonetics, the branch of linguistics that refers to the mechanics of the pronunciation of sounds: the correctness of Eliza's performance in the aspiration of the sound is judged according to the occurrence of a flickering candle flame due to the stream of air from her mouth. The second clip from the same film portrays Eliza at Mrs Higgins's while introducing herself to the guests in a very amusing way: owing to her overemphasised attention given to the pronunciation of the phonemes in "How do you do, Mrs/Mr ...", she offers an example which is halfway between phonetics and phonology, still lacking social effectiveness, producing, instead, amusement. The third video<sup>2</sup> provides a clear example of phonology, with Eliza succeeding at speaking in a natural way, thus being able to communicate her dissenting thoughts to Professor Higgins effectively. The three videos were meant to make the distinction between phonetics and phonology clear and memorable at the same time. During the study of the text-book section on "voicing" (86-99), with emphasis on place and manner of articulation, and "suprasegmentals" (102-105), with emphasis on stress pattern, rhythm, intonation and

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<sup>1</sup> Loewe, F. (1964). *My Fair Lady*. New York: Columbia.

<sup>2</sup> Asquith, A. & Howard, L. (1938). *Pygmalion*. Metro-Goldwyn-Mayer (MGM).

word juncture, the continuous reference to the preparatory activities through videos supported the students' comprehension, while reducing the "intrinsic" (Sweller, 2010; de Jong, 2010; Paas & Sweller, 2014) cognitive load of the subject matter. The teacher's final presentation on the topic was easily accessible to all students, since it recalled and systematised what they had already handled and comprehended.

The example that follows refers to the text-book chapter on "The History of English" (Winkler, 2012: 166-194), another topic that could not be supported by previous knowledge, since it was non-existing. Therefore, building up a "schema" (Bartlett, 1932; Rumelhart, 1980) was needed. The video that was chosen shows the distribution on a map of Europe of the translation of English words into the language of each country. The idea was to highlight the two main origins of English vocabulary, Germanic and Romance: according to a selected word of Germanic origin, as cow, chicken or snow, a divide between Romance and Germanic language countries would be displayed; with words like beef, poultry or chivalry a unitarian picture of words of Romance etymology across Britain and the Mediterranean countries would appear. Additional videos were used to make history tangible: one dealing with the Angle-Saxon boat unearthed in Sutton Hoo, accompanied by the presentation of an expert from the National Trust; another one displaying the Bayeux tapestry, containing an audio and visual chronicle of the 1066 Norman invasion, with its characters and events. The videos supplied a visible sign of the main developments that took place in the history of English, before and after the Norman invasion, thus contributing to the construction of a complex "schema" (Bartlett, 1932; Rumelhart, 1980), which proved useful when contextualising old and middle English through text-book activities and, finally, the teacher's comprehensive presentation to round up the whole topic.

The third experience with the same group of students refers to an introduction to the chapter on "Electronic-Mediated Communication and its Effects on Language" (Winkler, 2012: 244-259), a topic that could easily be related to the students' personal experiences of texting. In order to stir their memories and provoke a reaction for or against the issue, two videos with contrasting views on the topic were selected: one video showed an interview with the linguist David Crystal, who argued, in a very provocative way, that the habit of texting has no detrimental influence on language; the other video regarded an interview with a teacher who expressed his worries about the deleterious repercussions on his students' spelling, sentence structure, ultimately on their writing skill. The activity was organised in the following manner: students were divided into two groups; each group was given one of the two videos and asked to watch it and prepare to report to members of the other group; after the comprehension activity, each group member was invited to work with a member of the other group and report about the answers to the video interviews. As expected, while going through the task, the students' exchange produced the result of activating the students' previous knowledge on the matter together with their emotional responses, a very helpful way to prepare for the study of the text-book chapter.

What follows refers to experiences with second-year undergraduates in the same degree course in foreign languages and literature, beyond the B2 level of English, with a syllabus focused on the structure of the argumentative text in the press with its main components - claim, evidence and warrant, according to Toulmin's (1958) theory - and the repercussion of the speaker's perception of the audience on his or her language register and arguments to be persuasive (Di Nisio, 2020). Since the students had never worked on this type of text, they did not possess a specific mental "schema" (Bartlett, 1932; Rumelhart, 1980) to make new input immediately

meaningful. Therefore, a section of the film *Julius Caesar* (1953)<sup>3</sup>, featuring Marlo Brando as Mark Antony when delivering his funeral speech after Caesar's murder, was chosen. The whole activity was meant to become a landmark, the indelible "schema" (Bartlett, 1932; Rumelhart, 1980) to turn to every time a new press argumentative article was analysed and a new component was focused on during the course. The analysis of an argumentative text implies the identification of various elements interacting with each other, which produces high "intrinsic" (Sweller, 2010; de Jong, 2010; Paas & Sweller, 2014) cognitive load. If the cognitive process is not adequately supported, the various data may exceed the capacity of the working memory, leaving a student with weak retention in long-term memory. In the above teaching example, in order to overcome its "intrinsic" cognitive overload, "germane" (Sweller, 2010; de Jong, 2010; Paas & Sweller, 2014) cognitive load was intended to smooth learning through the knowledge and analysis of the funeral speech scene from the film.

A video was the support to hold on to during the whole course, even to make a reference included in an article meaningful: in the second-year course, before reading "How the sense of an ending shapes memory" (Hartford, 2016), which mentions psychologist Daniel Kahneman, a schema-building activity was needed to understand who he was, since the students had never heard his name before. The comprehension of a YouTube video, showing him while telling the same story in the article, became the pre-knowledge to understand the article, the new "schema" (Bartlett, 1932; Rumelhart, 1980) the students did not have before.

The videos and the accompanying tasks operated as "advance organisers", a concept postulated by Ausubel (1963), mainly based on resources - materials and tasks - presented before the learning material itself, meant to make new input significant from the very first approach. The schema-building and schema-activating questions were always accompanied by an awareness raising stage in which the teacher elicited the students' answers with regard to the efficacy of the procedure followed in the suggested tasks, and, finally, explained the rationale behind the adoption of videos and tasks to produce or recall existing knowledge, the first step in the comprehension of new materials. The teacher's belief was that a combination of practice and consciousness of its underlying rationale should lead students to gain greater control over the processes of learning.

The teacher's perspective that is presented in this paper with regards to the use of videos in in-class activities witnesses a type of care towards the learner that does not derive from the teacher's vague expression of willingness to help: starting from the teacher's understanding of how comprehension is processed, the learners' centrality implies also respect for their mental processes, together with their affective and emotional responses to them. Attention to involvement in the learning process, to awareness of cognitive processes and to ensuing autonomy in the management of strategic planning of learning is among the main aspects of a humanistic approach, as summarised by Bortoluzzi (2003:170).

## Conclusions

Owing to the frequent inclusion of videos in teaching, especially since the advent of YouTube, literature on multi-media educational experiences has expanded. A partial overview of the wide-ranging scientific literature has been presented, to give a picture of some of the cognitive and language perspectives regarding the development of video comprehension: multiple

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<sup>3</sup> Mankiewicz, J. L. (1953). *Julius Caesar*. USA: Metro-Goldwyn-Mayer (MGM).



intelligences, right and left hemisphere, brain wave frequency, dual coding, comprehension strategies, formulaic language and chunking abilities from captioning.

The present paper has faced the question of whether the practice of using double-channel materials is always advantageous to learning, just because of the attractiveness of the media. In an attempt to deal with the issue, studies in cognitive psychology on multi-channel communication have been recalled with their main arguments: on the one hand, dual coding is regarded as a motivating device; on the other hand, exposure to two language codes, images and commentary, is seen as the source of cognitive overload in working memory, which hinders long-term meaningful retrieval.

Examples from the writer's experiences of teaching English as a second language to undergraduates have been given to illustrate how a teacher may endeavour to include videos in the learning pathway to activate or create a "schema" (Bartlett, 1932; Rumelhart, 1980) conducive to comprehension, with the aim to reduce the learner's cognitive load when approaching new input. First of all, criteria guiding the choice of a video have been indicated, such as the overall consistency between the visual and the verbal language. Then, evidence of two main teaching objectives, generating and activating a "schema", has been given.

The lessons that have been recalled ended with the students' metacognitive reflection on the main function of a video as the mediator between new and old input: through their considerations of the effectiveness of the process, the learners realised how the former, the new input, becomes meaningful and its storage more long-lasting, thanks to the pre-existence of the latter, the old input. It is the function that Ausubel (1968) called "advance organiser", the role of a learning support that reduces processing time, while increasing effectiveness in comprehension and organisation of new data, anchoring them to a long-term mental structure. Awareness of the process should lead students to their self-monitored employment of multimedia resources, like videos, within and beyond classroom tasks in everyday life.

### **Acknowledgements**

I would like to thank Maria Bortoluzzi for her clarifying comments on an earlier version of this article.

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