

# Video-based Learning in Higher Education — A Holistic View of Pedagogical and Implementation Strategies

Xiaoxia Wang<sup>1</sup>, Yong Chen<sup>2</sup>

Teacher Centre, Qujing Normal University, Yunnan, China, 655011

**Abstract:** Video-based learning has become a widely accepted digital learning method. Videos are used to present and elaborate on concepts, explain complex problems, demonstrate a procedure, or gain an understanding of learning in action. The benefits of using videos in education have been discussed for several decades in research (Hansford & Adlington, 2009; Malaga, 2017; SAGE Publications, 2015; Woolfitt, 2015). Videos enable learners to engage in the cognitive learning process and help them make sense of the learning materials. This paper discusses the pedagogical principles of using videos for learning. The authors examine possible pathways and strategies for implementing video-based learning in higher education, from setting up institute support to utilizing video-hosting platforms. This paper aims to provide theoretical and operational insights for digital learning professionals to enhance individual and organizational confidence and readiness in integrating videos.

**Keywords:** Educational video; User stories; Video strategies; Video-based learning

## 1. Introduction

In recent years, video-based learning practices have been the core components of new education concepts, such as flipped classrooms and Massive Open Online Courses (MOOCs). For example, the core element of implementing a flipped classroom is to ask students to watch videos before class so they can digest the learning content at their own pace and explore the concept more thoroughly with teachers and peers in class. Some teachers may feel that they lack the confidence to embed videos in teaching or that this will expose their teaching style or skills to a broader public of peers. Some teachers may want to take the initiative to enhance and showcase their teaching skills. Hence, it is recommended that institute introduce the video-based learning concept phases.

Many digital learning professionals take responsibility for implementing video-based learning and providing support and leadership in current curriculums. This paper aims to connect the theoretical foundations of video-based learning with the practical strategies for implementing initiatives.

## 2. Educational principles of educational videos

Carmichael et al. (2018) summarize the top 10 reasons students watch educational videos.

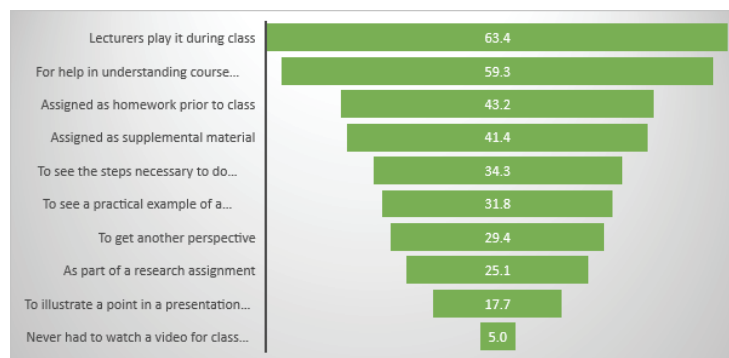
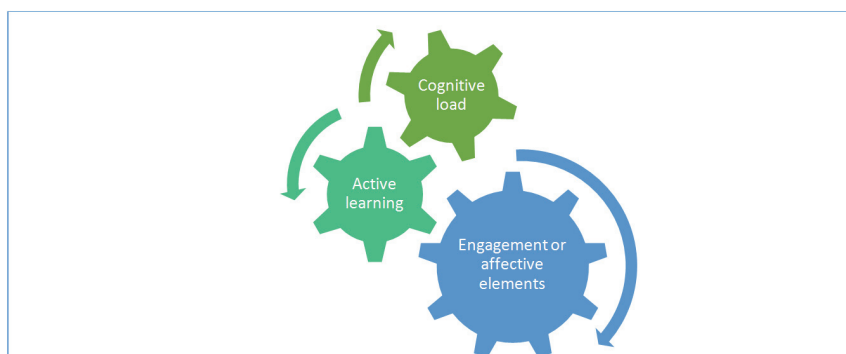


Figure 1 Why students watch educational videos? (Carmichael et al., 2018)

The above diagram is the summary of the data from Carmichael et al. (2018). The original article provides how the data was collected. It is a good pedagogical practice to understand why and how learners learn in a digital world. In this case, why learners watch video and why it is important. Brame (2015) highlights three factors when considering educational videos: cognitive load, engagement or affective domain, and active learning.



**Figure 2 Effective educational videos (Brame, 2015)**

In the active learning domain, several other studies have demonstrated that students' active participation can improve their learning results (Dodson et al., 2018; Seo et al., 2021; Yoon et al., 2021). Active learners employ the affordances provided by learning settings and objectives to direct their learning. While some teaching staff may find that videos engage their students, others find them unnecessary for their units. Willmot et al. (2012) show strong evidence that digital videos can inspire and engage students and increase their motivation and grades. The work of Galbraith (2004) shows the essential benefits of using videos to enhance authentic learning experiences for students.

In the cognitive load domain, researchers argue that educational videos should not overload learners (Brame, 2015; Kruger & Doherty, 2016; Yu, 2022). Guo et al. (2014) highlight the percentage of students that watch a given video over five different video lengths. They found that while students watched approximately 100% of videos between 0–6 minutes, they watched just below 100% of videos between 6–9 minutes in length. When videos were between 9–12 minutes, students watched less than 60% of videos, and they watched approximately 20% of those between 12–40 minutes.

According to the research (Brame, 2015; Guo et al., 2014; Kruger & Doherty, 2016; Yu, 2022), this paper summarizes the educational value of using videos for learning.

**Table 1 Educational value of using videos for learning**

To demonstrate experiments or the problem-solving process
To introduce a lecturer or unit
To record a lecture for students who miss the class
To illustrate abstract principles through the use of specially constructed physical models
To illustrate principles involving three-dimensional space
To demonstrate changes over time (for example, using an animated, slow-motion, or sped-up video)
To demonstrate decision-making processes
To demonstrate methods or techniques of performance
To synthesise, summarize, or condense contextually and media-rich information relevant to the course
To demonstrate the navigation of learning spaces or assignment submission

The following sections introduce the types of videos in learning.

### 3. Types of educational videos

People who will be involved in creating videos at higher education institutes typically include lecturers, professional staff, and students for various uses, including curriculum delivery, assessments, and recording webinars or guest lectures.

#### 3.1 Core curriculum videos

Core curriculum videos are created to welcome students, explain concepts, and demonstrate software skills, experiments, or experimental situations. They also include embedded online videos.

- Supplementary curriculum videos

Instructors can also create an informal end-of-week unit to recap the previous week's tasks, demonstrate the assessment submission method, record feedback summaries, and screencast forum posts.

- Recorded webinars

Recorded webinars are mainly used for professional training purposes. When we have a webinar or Zoom meeting, we may want to review the content after the meeting, so a webinar recording and editing tool will be needed.

- Recorded classroom presentations

A face-to-face classroom presentation can be recorded through an application and submitted to the online learning system for students to review.

- Web-based lectures

In this paper, a web-based lecture refers to the digital recording of lectures for video streaming. Many universities record face-to-face lectures and automatically put the recorded videos on the Learning Management System so students can view them later.

- Talking heads or interview recordings

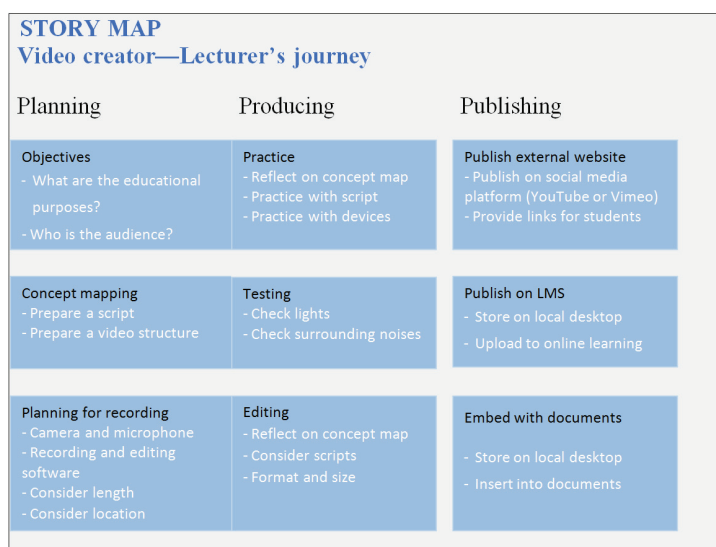
Talking head videos include experts filmed to promote the course or explain a theory. Interview recording can be similar to the talking head method but may be less focused on the talking setting's background and can be used by professional staff for student support or marketing or by students for group work demonstration.

- Screencast

A screencast is a digital recording of the user's screen with voiceover narration. This format allows the instructor to include PowerPoint slides, images, or motions to show the operation or thinking process. Hibbert (2014) found that students respond well to the screencast approach.

## 4. Video production process

There are four main phases in the video production process, although they are not entirely linear: planning, recording, editing, and publishing. Below is an example of a lecturer's journey in producing an educational video.



**Figure 3 Video creator—Lecturer's journey**

During the planning stage, you must identify the objectives of the video, who the audiences are, and what tools you will use. In the recording stage, execute the elements you have planned. Editing is a critical and creative process to produce the final concise product. Publishing is the stage in which you will upload your video to engage your audience. For higher education, videos can be published through Moodle, Canvas, the institution's home website, social media channels, etc.

## 5. Implementation strategies

A support service will help the institute enhance teachers' capabilities of using videos pedagogically and efficiently to provide high-quality video content for online delivery. The institute's digital learning or EdTech support team will typically use various strategies to help academics, professional staff, and students more fully understand and utilize the opportunities that educational

videos present and gain confidence in making compelling course videos. The team can provide the following support:

- Webinar training with a specific topic
- Consultation by appointment
- Drop-in sessions

The following sections provide insights into and examples of implementation support framework and technological considerations.

## 5.1 Institute support framework

If an institute decides to launch video-based learning, it is recommended that institutes consider the following implementation elements.

Planning for implementation

The digital learning team will plan the focus of the video-based learning project.

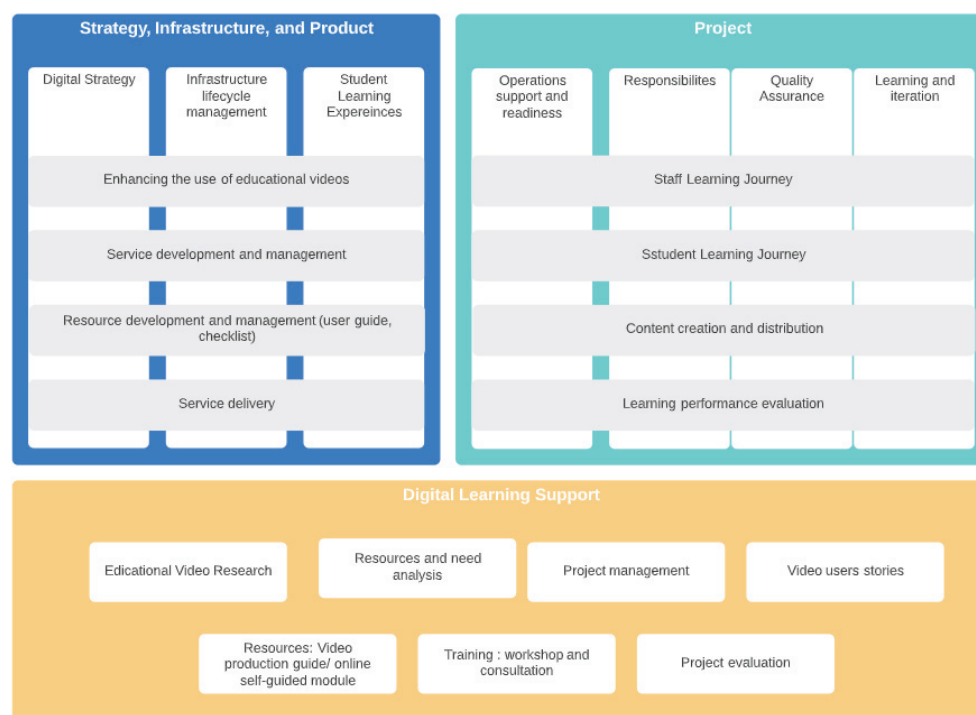
- Identification and implementation of early adopters

Institutes can identify early adopters interested in introducing video-based activities in teaching. We work closely with these early adopters and find a better way to integrate videos into teaching and learning.

- Revision and application

Based on the original plan and the feedback from the early participating lecturers and their students, revise the plan to enhance the use of educational videos in teaching and learning.

The below support framework is an example of implementing video-based learning projects.



**Figure 4 Organizational support in video – based learning**

## 5.2 Equipment

The institute should provide equipment suitable for creating videos for teaching and learning to meet staff's needs. Meanwhile, personal equipment may be used.

For the professional use of videos, such as talking heads for courses and service promotion, we may need a professional studio or professional video production specialist to record.

The following table shows examples of when videos can be used, who will use them, and what tools are needed to create them.

These tools are only a selection of the products available for editing videos. Individuals or organizations may already have a product they prefer or may want to look for something more suitable to their needs. It is beyond the scope of this paper to provide detailed instructions for using different tools to create videos for different educational purposes.

**Table 2 Video usage and equipment examples**

Context	Category	People	Tool examples
Course introduction or reflection	Curriculum	Lecturers and course designers	Computer Web camera Headphones
Concept explanation	Curriculum	Lecturers	Computer Web camera Headphones
Decision-making process	Curriculum or professional development	Lecturers and professionals	Computer Web camera Headphones
Web-based lecturer	Curriculum	Lecturers and course designers	Echo 360 or Canvas Studio
Talking heads	Curriculum or professional development	Lecturers and professionals	Computer Web camera Headphones Professional studio
Webinar recording	Curriculum and professional development	Professionals and student support	Computer Web camera Headphones Zoom
Screencast	Curriculum and professional development	Professionals and student support	Computer Web camera Headphones Apowersoft or Jing
Interview recording	Professional development and student support	Professionals and student support	Zoom Web camera Headphones
Technique demonstration	Professional development and student support	Professionals and student support	Computer Web camera Headphones Apowersoft or Jing

### 5.3 Video platforms

To handle increased numbers of campuses, modes of delivery, courses, staff, and students, in the long run, institutes may need a platform that allows instructors and students to collaborate actively through video and audio media.

Institutes can upload the created video to an online platform, such as YouTube or Vimeo, or purchase a platform, such as Arc or Kaltura, which are integrated with Canvas so that videos can be stored and shared from there. Alternatively, we can upload videos from computers to Canvas Files.

### 5.4 Workflow

Institute captioning workflows for an online third party can look like this:

- ◆ Faculty, students, and staff visit a support site to submit a captioning request.
- ◆ Digital learning staff intake and process those captioning requests.
- ◆ Videos are sent to an agreed third party for transcription and captioning.
- ◆ The digital learning or IT staff track the captioning process in a spreadsheet to keep an eye on which classes or content have or have not been captioned.

### 5.5 Video formats

After careful comparison, the authors identified specific video formats that should be avoided for online delivery courses. For example, the AVI format produces videos that may be too large and cannot be played natively on many devices. An exception could be made for students or faculty who want to implement a professional video editing class; in that case, AVI videos might be considered. The most durable video formats seem to be WMV and MPEG-4.

## 6. Conclusion

The first part of this paper discusses the educational principles of introducing video-based learning and how it would benefit learners and educators. Three considerations for implementing effective educational videos are discussed: cognitive

load, engagement, and active learning. The second part of this paper provides practical strategies for implementing video-based learning to achieve such educational values. The examples include using different video types in learning contexts, identifying the implementation support framework, and considering technical factors, such as video platform, length, and format.

The future endeavour of the authors will be to look at how educational videos help educators achieve learning outcomes and how educators perceive their use.

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