

## **A Study of the Deconstruction of Instructional Video in the Era of Big Data**

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### **The Value of the Deconstruction of Instructional Video in the Era of Big Data**

Nowadays, education has gradually stepped into the era of big data, and the study and development of instructional video carried out on the basis of this context also need the guidance of a new way of thinking.

In general, data refer to the numerical information recorded through experiment, statistics, examination, measurement, and other means for purposes such as scientific research, verification of a proposal, technology research and development, and making a reasonable decision. The practice of recording, collecting, backing up, and classifying data in an accurate and comprehensive way, and then conducting a rigorous mathematical analysis of these data can effectively reveal the development pattern of the subject in concern. Somewhat different from the above concept is big data, which are massive, clustered information generated via recording, counting, and analyzing on a large scale. In the era of big data, technologies such as cloud networking, Internet of Things, online education, and social networking will be fully developed, which will exert an impact on the idiosyncrasies of traditional industrial age with richer educational resources and more comprehensive sharing, and innovation will become the main theme in the era of big data. It is necessary to constantly break through and innovate, embody the characteristics of the era of big data, and pay more attention to digital education. It follows that finding out how to acquire more types of valid data has become a key to improving teaching outcome and teaching efficiency of an instructional video, but obviously, the traditional data extraction mode for instructional video would not be able to meet the expectation, so only by theoretically re-deconstructing the instructional video can we truly provide an adequate basic data for the big data approach.

The deconstruction in this paper consists of three parts: 1) A study of the structural evolution of instructional videos; 2) A contemporary study of the definition of instructional videos; 3) A study of the classification of instructional videos.

### **The Structural Development of Instructional Videos**

Throughout the long period of instructional video usage, its main functional attribute, i.e., to provide assistance during learning, has never changed. In the age of network data nowadays, instructional video plays an increasingly important role in teaching. To better enhance the function of teaching with the help of instructional videos, the research-aimed deconstruction should start with a structural study.

The development of teaching and education and human technological progress have been supplementing each other for a long time, not to mention that the film technology has also emerged as early as the 19<sup>th</sup> century. Researchers found that when information acquired from visual sense and tactile sense conflict or contradict, human will trust the visual sense more. This is why audiovisual instructional videos are still the best approach for assisting education and teaching so far.

In light of the history of modern education, distance education is the earliest traceable educational mode that extensively uses instructional videos for formal learning. Therefore, from the three development stages of distance education (correspondence education stage, tele-education stage, and modern distance education stage), we can deduce that instructional video was first used

purposefully in around 1930. According to the origin, application models and carriers of video resources, the evolution, and development of instructional video resources can be roughly divided into three stages. Typical core resources at each stage are educational film and television resources, online courses, and micro-video courses respectively. Fig. 1 illustrates the history of educational video drawn in *Micro-video Courses: Evolution, Positioning and Applications* by Wang Mi, a teacher at the Department of Education Information Technology of East China Normal University. As shown in the diagram below, previous resources are still used later, but its pivotal position is gradually replaced, as application models and carriers of the sources become more diversified, not to mention that the approaches to acquiring the resources have also increased in number, the audience base expanded, modes of applications become more increasingly flexible, and also the addition of more and more production and application-related technologies. From the abovementioned three types of instructional videos, we can deduce the main structural model of instructional video at each stage.

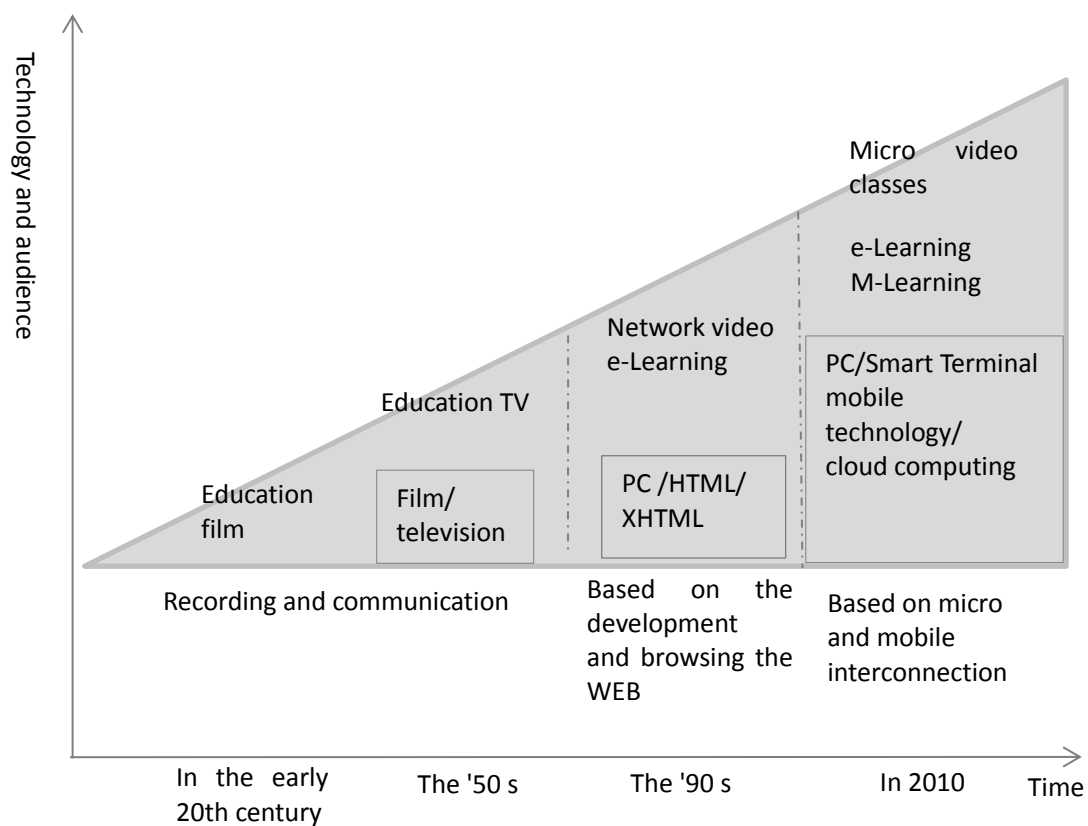


Figure 1. The history of educational video.

### The Analysis of the Structure of Instructional Videos at the Initial Stage

In the late 1920s, the emergence of motion pictures with audio pairings was a major period in the history of educational film. Since the 1950s, television technology basically matured and gradually became a powerful and popular communication medium, leading to the rapid rise of the educational television model and expediting a new type of schools. Educational television programs in the 1960s were divided into two fundamental types: one that targeted schools, and the other, which targeted youth and adults in society. In the 1970s, satellite instructional television was extensively popularized and applied, while educational television moved towards maturity step by step. Currently, educational television programs are developing in the direction of networkization and digitalization, and multimedia began to make itself a part of the teaching process at this stage. As time goes on, the indicator of instructional video production technology gained increasing appreciation by people and finally became one of the important factors in the evaluation of

instructional videos. At the initial stage, instructional video was in its infancy, and there was no structure for instructional videos on the whole, let alone systematic evaluation.

### **The Analysis of the Structure of Instructional Videos at the Second Stage**

The second stage is the stage of online video courses. In the 1990s, especially with the development and application of the Internet, the globally-emerging online schools gained rapid growth. In this period, instructional videos began to enter the traditional classrooms, and its main users were unconventional social learners from colleges and universities, as well as the teachers and students from conventional colleges and universities.

Online video courses make up an important part of online courses. Online video courses in China initially relied mainly on the establishment of high-quality courses and developing high-quality open video courses with the help of colleges and universities to provide students with free online videos.

At the stage of online video course, the early prosperity basically depended on the courses intended for students, but the forms did not gain any further development. At this stage, there emerged a type of software which is designed for the evaluation of instructional video, but there was no normative evaluation system. Meanwhile, in this period, people became aware of the significance and role of the instructional video framework, but they have still yet developed the consciousness of structural study of instructional videos and to set up an evaluation system, and there was no uniform core idea to form a foundation of support.

### **The Analysis of the Structure of Instructional Videos at the Present Stage**

At present, the structure of instructional videos is in the era of omnimedia and the age of instructional video courses, and the concept of lifelong learning also promotes the diversity of learning styles and gradually moves towards miniaturization and fluidification. In recent years, the diffusion of online video market resources facilitates the application of online video resources. Moreover, the progress of smart mobile devices, the popularization of instructional media technology and micro-video application environment, as well as the application of educational resources on cloud architecture also provide the support for curriculum resources. Meanwhile, personalized and “intelligentized” learning methods appear by the dozens.

To sum up, the general structural characteristics of the current educational videos are: mobile network is used as the main medium for information transmission, with the conventional use of films, televisions, and the internet compatibly adopted as a form of supplement; the mainstream mode of transmission is two-way communication; the contents to teach are systemic, precise, and personalized; the duration of each curriculum is diversified, and features shorter lessons but exceptionally enriched and well-targeted teaching forms, allowing effective interaction with the learners; the idea of media convergence is gradually applied to the structural design of instructional videos.

The abovementioned evolution of instructional video structure indicates that technology is now playing an increasingly important role in the application of instructional videos. With the continuous development of the concept, structural studies of instructional videos are greatly expanded both in width and depth. More and more scholars are also becoming more aware of the value of conducting such structural studies, and the demand for a teaching video evaluation system, as well as for a detection architecture, is increasingly urgent.

### **The Contemporary Study of the Definition of Instructional Videos**

There has been no scientific and authoritative definition for instructional videos for a long time. This paper proposes the following literal definition for the concept: instructional video is a form of instructional media centering on the description of knowledge in the logic of imparting knowledge for the purpose of passing on the know-hows and skills, and it is designed, arranged, produced, and published by filmmakers and television professionals in a certain space using the corresponding

film and television technologies and artistic methods in accordance with the requirements and objectives of syllabus to facilitate learning.

### The Study of the Classification of Instructional Videos

The research conclusions above show that the narrow definition of instructional video only covers that of learning source-oriented instructional video. The primary medium for learning source-oriented instructional video is the internet, and there are some that are transferred to the new mobile media.

As required by the study, according to different attributes, perspectives, and usages, learning source-oriented instructional videos in the era of big data can be classified as Table 1:

Table 1. Video classification table of learning resource teaching.

category	attribute	Divide the name	Classification principles
Subject classification		Mathematics, Chinese, physics and other specific subjects such as teaching video	It is usually divided into individual disciplines
Sort by video time		1. Long teaching video 2. Short tutorial video 3. Microlecture video	Usually divided according to the time principle of classroom teaching, more than 45 minutes is called long teaching video, 10-45 minutes is called short teaching video, and less than 10 minutes is called micro-teaching video
Sort by learning style		1. Continuous learning video 2. Stage teaching video 3. Teaching by fragmentation video	Shard teaching video is usually divided according to the learning status of learners. The teaching video that needs to be learned in a long period of time within a fixed period of time is called continuous teaching video, and the teaching video that is completed in a period of time is called stage teaching video, which can be learned anytime and anywhere is called shard teaching video
Divided by the learning process		1. Preview instruction video 2. Student teaching video 3. Review class video 4. Whole process teaching video	It is usually defined by different stages of learning
Sort by nature of learning		1. Auxiliary teaching video 2. Self-taught teaching video	Generally, the division principle is whether to be used in class. The auxiliary teacher's teaching is called auxiliary teaching video, and the independent learning is called self-study teaching video by virtue of teaching video
Classify by audience attributes		1. Teacher training class video 2. Student learning class video	It is usually divided according to the attributes of the audience (users). The teaching video of the trainer's teaching skills is called teacher training video. It is mainly aimed at students to learn specific subject knowledge, known as student learning class teaching video
By age group		1. Children's education video 2. Minors teach video (It can be further divided into several types according to the grade, such as video in grade 5.) 3. Adults teach video 4. Old people teach video	It is usually divided according to the physiological learning stage. The basic education primary and higher stages under the age of 18 are called juvenile teaching video, higher education and adult education of the age of 18-60 are collectively called adult teaching video, and the age of 60 is

		called senior teaching video
Media classification	1.Satellite TV teaching video 2. Media player class teaching video 3. Network class teaching video 4. Mobile network class teaching video	It is usually divided according to the principle of different media mainly applied in the process of teaching video communication
By technical classification	1. .Live class teaching video, video class teaching video 2.Two dimensional space class teaching video, three dimensional space class teaching video 3. Receiving type of teaching video, interactive type of teaching video 4.Hd class teaching video, non-hd class teaching video	According to the recording and broadcasting technology of video, it can be divided into live broadcast and recording According to video rendering technology can be divided into two categories: plane effect and stereo effect According to computer technology, it can be divided into two categories: receiving type and interactive type Classification is conducted according to video technical indicators
Sort by subject	1. The teacher speaks for himself 2. The non-teacher speaks for himself 3. The teacher herself teaches in a mixed way with other methods	According to the presentation subject of teaching video, some teachers teach together with their own teaching ideas, others replace the teaching ontology with animation or other forms of presentation subjects, and only use the teaching ideas and methods of teachers. There is also a hybrid approach to teaching

It is not hard to find from the classification of learning-oriented instructional video in the era of big data that, according to the five characteristics of the era of big data, i.e., massiveness, high speed, diversity, low-value density, and authenticity, this paper provides a big data approach with an adequate basic data with analytical data acquired from the re-deconstruction of instructional videos and a whole new way of thinking. In addition to the above, the application of big data technology will do more good for the development of personalized instructional videos, and it reaffirms the possibility of witnessing the good potential of instructional videos in the era of big data, playing a vital role in further in-depth exploration and study. The new generation of information technologies represented by big data and the internet have fitted into all aspects of social life and profoundly changed how people learn, produce, and live. In the era of big data, more interactions, personalized service, and flexible academic structure offered by the instructional videos have also rejuvenated the traditional teaching model.

## References

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