

# User Experience in Instructional Video: A Systematic Review

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**Abstract**—Instructional videos are content that is often used in learning. Not much research has analyzed the factors that influence user experience in using instructional videos. The purpose of this study is to determine the factors that must be considered to provide a good user experience. The research method used is the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analyses) model. The articles reviewed are Scopus indexed in the 2018-2023 range and use the Publish or Perish (PoP) application. The results showed that 16 relevant articles out of 262 used the keywords user experience in instructional video, design learning video, design instructional video, and length of learning video. Based on the analysis of 16 articles, user experience in instructional videos relates to cognitive, satisfaction (emotional), and interactivity aspects. The principle of applying multimedia can reduce the audience's cognitive load in listening to video messages. The video duration considered effective is a short video that is less than 6 minutes. Video interactivity can be realized by applying generative principles in the form of presenting quizzes or questions during or after the presentation of the video. Research findings show that in order for the audience's experience to be more meaningful when watching videos, it is necessary to pay attention to the audience's cognitive capacity, satisfaction, and interactive activities (stimulus from the video).

**Keywords**— User Experience, Instructional Video

**JEET Category**— Research

## I. INTRODUCTION

Video is currently widely used to present information in traditional classes, online classes, and blended classes. The use of video is able to provide the same perception to students through visual, sound, and text messages so that it allows students to understand content in a faster and more effective way (Hung, 2016). The use of video in various fields has also increased, especially due to the widespread use of digital platforms (de Jong et al., 2019; Noetel et al., 2021). Video has also proven to be the most accessible resource in the online learning environment (Breslow et al., 2013). Video today also has great potential to enhance learning in an engaging,

interactive, and effective way (Navarrete et al., 2021).

However, most learning videos will only be watched in their entirety with the influence of good extrinsic motivation, learning design, and user experience design (Chan et al., 2022; Madariaga et al., 2021). Therefore, video-based learning that is effective in this condition is not only able to reduce cognitive load but also encourage and maintain student engagement, make it easier for students to access, and make students enjoy learning through videos.

The use of video is currently massive in the world of education, but on the other hand, not many people know about user experience design and the principles of making videos. Small things, for example, a video duration that is too long, can make it difficult for viewers to capture the main information in the video (Yu & Gao, 2022). Likewise, the structure of the message video presentation influences the audience's cognitive ability or capacity to capture the message video. The user experience design of a video must be carefully considered so that the audience can easily understand the information conveyed.

The application of several multimedia principles also plays an important role in providing experiences to students and reducing cognitive load. Compared to conventional designs, instructional design based on cognitive load theory shows that procedures based on cognitive load theory produce better performance (Sweller, 2020). For example, applying the principle of segmentation will provide students with experience in listening to videos in the form of small segments (Prabawa et al., 2024). Segmentation designs allow students to control the pace of learning required for information processing (e.g., think, reflect, digest, and integrate), take notes before moving on to the next segment, and focus their attention and thinking on one particular thing. Segmentation helps maintain attention and keeps students focused on learning for a longer time (Zheng et al., 2022). Even though these principles are important, only a few videos apply design principles in making learning videos (Fyfield et al., 2022).

Interactivity in a video is also essential. Students not only

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watch videos, but videos can encourage meaningful learning (Lamontagne et al., 2021). Students are allowed to answer the questions presented in the video; students color important words, make concept maps from abstract material, and so on (Castro-Alonso et al., 2021). Interactivity design in video presentation is not only related to the internal structure of the video but also how to design video presentation in a digital platform, for example, moodle, Schoology, and others, to support the realization of interactivity. One of the principles of video design is the generative activity principle, which suggests encouraging students to do generative activities from videos (Fiorella et al., 2019; Fiorella & Mayer, 2016; Mayer et al., 2020). Generative activity is a strategy to encourage instructional videos that are developed to be more interactive. Students can get a better meaning when the video is able to encourage interaction. To achieve maximum benefits, designers must consider three elements when designing and presenting interactive videos: cognitive load, student involvement, and active learning (Kamal Afify, 2020).

User experience is also related to the comfort and satisfaction of students using videos. Currently, video length is a concern and much research. Video duration has the characteristics of short, medium, and long duration. The length of instructional videos can vary from a few minutes to more than half an hour, depending on the material presented and the approach used by the teacher (Yu & Gao, 2022). Given the current target of instructional videos, Generation Z and Generation Alpha, who are very familiar with social media, tend to present short videos, so the duration of the instructional videos is important. In the last decade, social networking platforms, such as Instagram and TikTok, have made short educational videos more widely available.

There's also a trend of using the instructor on the screen for the duration of the video. This method has mixed results and does not necessarily have a positive impact on learning. Research results have shown that the presence of an instructor on a screen increases student attention, information retention, and satisfaction (Kizilcec et al., 2014; Wang & Antonenko, 2017). From a different perspective, having the instructor on a layer can also distract students from things

## II. OBJECTIVES OF THE RESEARCH

This research is focused on the following three objectives. O1: Exploring the user experience of instructional videos from a cognitive aspect O2: Exploring the user experience of instructional videos from the aspect of satisfaction (emotional) O3: Explain interactivity design in instructional videos

## III. RESEARCH METHOD

This research is focused on three objectives as follows. O1: Exploring the user experience of instructional videos from a cognitive aspect, O2: Exploring the user experience of instructional videos from the satisfaction (emotional) aspect, O3: Explain the design of interactivity in instructional videos.

### A. Research Design

The articles reviewed used the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) model (Moher et al., 2019). PRISMA is a tool and guide used to evaluate a systematic review or meta-analysis. PRISMA assisted in compiling a quality systematic review. PRISMA is composed of a checklist that contains guidelines for what items must exist and is explained carefully in a systematic review and meta analysis.

### B. Search Strategy

Articles that examine user experience and instructional design are searched using the publish or perish application in Scopus-indexed journals. Databases generated from PoP are further explored through sites such as Scopus, Education Resources Information Center (ERIC), Database Science Direct, and Springer. The keywords used to search for articles are presented in Table I below.

TABLE I  
KEYWORD AND COUNT

| Number | Keyword                        | Count |
|--------|--------------------------------|-------|
| 1      | Design of video learning       | 200   |
| 2      | User experience in video       | 33    |
| 3      | Length of instructional videos | 8     |
| 4      | Design of instructional videos | 21    |
|        | Total                          | 262   |

The search was limited to articles published from 2018 to 2023. The search for articles also used inclusion and exclusion criteria, as shown in Table II.

TABLE II  
INCLUSION AND EXCLUSION CRITERIA

| Inclusion   | Exclusion  |
|---|--|
| Articles must have been published in journals indexed by Scopus, ERIC, Science Direct, and Springer | Conference proceedings, dissertation/thesis, and book chapters are not selected. |
| Full article text   | Review, meta-analysis, editorial, or comment articles are not selected           |
| Articles that examine video design for learning are open access                                     | Articles not published in English  |
| Articles are open-access  |  |

### C. Article Selection

Process Searching for articles using the PoP application resulted in 262 articles indexed by Scopus by entering the keywords Design of video instructional videos, User experience in videos, Length of instructional videos, Design of instructional videos. Each keyword finds a varying number of articles respectively. In the identification stage, the papers were selected by eliminating unrelated articles, such as non-educational video research, video game research, video conferencing research, and the like, so 202 articles were obtained. The screening stage is to filter and examine articles from the identification stage using criteria in the form of article titles that are in accordance with the instructional design and user experience. The screening process resulted in 52 articles. At the eligibility stage, the 52 articles will be examined and re-evaluated so that they are in accordance with the research

questions that have been determined. The eligibility process resulted in 18 articles. At the included stage, it is ensured that the articles from the eligibility process are in accordance with the research objectives with the number of articles, namely 16 articles. The article selection process is illustrated using the following PRISMA diagram.

#### D. Data Analysis

The main things that were analyzed in the selected articles were descriptions of the duration of the instructional videos, multimedia principles used, user experience components, video interactivity, and instructor presentation components in the videos. The data collected was analyzed descriptively and qualitatively to describe the factors in the user experience of instructional videos.

## IV. IV. RESULTS AND DISCUSSION

### A. Results

Researchers do not widely carry out research on user experience in instructional videos. User Experience (UX) is the overall experience experienced by users when interacting with a learning video. In this study, UX includes aspects of cognitive (emotional) satisfaction and interactivity (feedback) when using instructional videos. In general, a synthesis summary of several articles related to cognitive variables, student satisfaction, and interactivity in using videos is presented in the following table. Table III. User Experience Aspects of Video Learning.

TABLE III  
USER EXPERIENCE ASPECTS OF INSTRUCTIONAL VIDEO

| Aspect        | Category                  | Recommendation   | Author   |
|---------------|---------------------------|--|--|
| Cognitive     | Multimedia Principle      | Modality signaling Segmentation  | (Borges & Silveira, 2019; Isomura, 2019; Zheng et al., 2022)   |
| Satisfaction  | Duration                  | Short videos (less than 6 minutes)   | (Kamal Afify, 2020; Yu & Gao, 2022)  |
|               | Visual and Content Design | Complete content (text and sound) Practicality Visual design Interaction   | (Bakri et al., 2020; El-Ariss et al., 2021; Elçiçek & Karal, 2020; Gao et al., 2022; Mayer et al., 2019) |
| Interactivity | Interactive Features      | Quizzes, annotations, feedback, poll exchanges, interactive summaries, generative activities   | (Palaigeorgiou et al., 2019; Priyakanth et al., 2021; Weinert et al., 2020)                              |
|               | Instructor in the video   | Picture in picture, writing/typing, and demonstration, active instructor tutorial, lecture, Khan style, talking head, Dialogue and monologue, voice over slides, text-only, animations included animation, video with instructors' hands, videos with instructors' faces | (Chan et al., 2022; Coşkun et al., 2021; Mayer, 2021a)   |
| Count         |                           |  | 16 article   |

#### O1: User experience of instructional videos from a cognitive aspect

User experience (UX) can play an important role in reducing the cognitive load experienced by students when interacting with videos. Cognitive load refers to the extent to which users must use cognitive thinking and effort to understand the content presented in the video. Efforts to reduce the cognitive load experienced by students refer to the cognitive theory of multimedia learning and the application of several multimedia principles (Mayer, 2012; Mayer, R. E., & Chandler, 2001; Mayer & Moreno, 2003). The part that is more studied in the reviewed articles is related to Extraneous processing principles, which consist of 1) coherence, 2) signaling, 3) redundancy, 4) spatial contiguity, 5) temporal contiguity, 6) segmenting, 7) background music, 8) audio quality, 9) video length reduction, 10) perspective (1st superior), 11) presenter's face, and 12) sound effects (Fyfield et al., 2022). Based on the results of a review of several articles that apply the Extraneous processing principle, it is found that the principles most widely used are: 1) modality

principle, 2) signaling principle, and 3) segmentation principle. The principle of modality relates to the presentation of messages that can be received by two different senses, for example, the senses of sight and hearing, so it has implications for presenting messages in visual and audio forms. The principle of signaling relates to marking important information in a video. These signs can be in coloring, animation, or bold print. The segmentation principle relates to presenting videos in small units or short durations to reduce students' excessive cognitive load.

#### O2: User experience of instructional videos from the aspect of (emotional) satisfaction of students

One indicator of student user experience in using instructional videos is satisfaction. In this analysis, indicators of audience satisfaction are measured through video duration and visual design aspects in the video. Video duration can have a significant effect on the user experience when watching videos (Kamal Afify, 2020; Yu & Gao, 2022). The exact length of the video can affect the level of user

engagement. Short videos may give users more time to engage with the content, so students may not feel satisfied with the show. On the other hand, videos that are too long can make students quickly get bored or lose interest. Based on the results of the analysis, video duration is divided into three, namely: 1) short duration (less than 5 or 6 minutes), (2) medium duration (more than 10 minutes and less than 20 minutes), 3) and long duration (more than 30 minutes). The results of the analysis show that the duration of the video which is considered to provide satisfaction to users is short duration. The reviewed literature mentions differences in duration for short videos, namely, there is a version less than 5 minutes and a version of less than 6 minutes. Videos that are shorter will feel boring and can reduce user satisfaction. Presenting relevant and effective content at the right duration will increase user satisfaction. User satisfaction in watching videos is also measured by the visual design. Based on the results of the analysis, the component that is considered most important by users is content, followed by visual design and

practicality. The content in the video can help users understand the information conveyed. Text that is displayed clearly and legibly helps users follow the narration or message conveyed in the video. A clear and well-heard voice also helps users understand the speech, explanations, or instructions conveyed in the video.

### O3: Design of interactivity in instructional videos

The indicators used to determine interactivity in a learning video are measured through two aspects: 1) interactive features in the form of giving quizzes, annotations, responses, polls, interactive summaries, and generative activities, and (2) the instructor's presentation model in the video. Interactive features in the form of questions or quizzes, which the video is divided into two parts. First is inline interactivity in the video, which is integrated into the video display. One site that supports this is <https://h5p.org/>. Fig. 1 is a video display using the site.

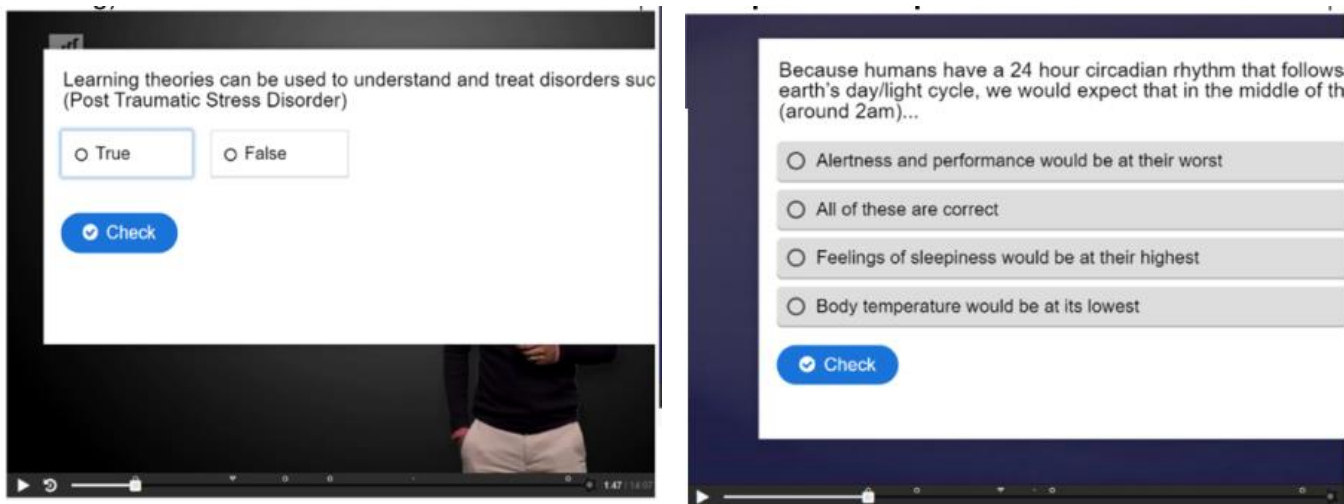


Fig. 1. Interactivity that is inline in Video, Source: (Jacob & Centofanti, 2023)

In addition, there is also external video interactivity, namely quizzes or questions that are presented separately from the video section. Figure 2 is an example of interactivity separate from video.

**1 Students read directions about the learning environment**

Learning biology requires practice in many different ways. Actively watching short animations, taking your own notes, and answering questions about the videos is one such practice strategy. The following pages contain videos that cover content taught over the past few weeks in your biology course. After each video, you will be asked to answer some questions about what you learned. After answering each question, you will also receive feedback about your responses.

You may go back to each video after you have watched it and you may take notes while watching the videos. After you watch the video, scroll down to see the blue arrow button to move to the next screen. Be sure to read and answer each question carefully and thoroughly.

It is important to remember that the score you get on this quiz will not affect your grade in your biology course. The quizzes are meant to help you understand what you have and have not learned yet. You will be asked to complete every question. Please do your best on all questions and if you do not know the answer to a question, you may write-in that you do not know.

**3 Students answer questions about what they learned**


Thanks for watching! Now, let's practice what you just learned.

In one or two sentences, describe emergence.

Many small things combining to make something that has a larger impact than the sum of its parts.

**2 Students watch instructional video(s)**

Please press play to watch this video. When the video is done, click the blue arrow to go to the next page. (Part A: Video 1)



**4 Students receive feedback on their response**

Question: In one or two sentences, describe emergence.

| Your Answer   | Model Answer  |
|---|---|
| Many small things combining to make something that has a larger impact than the sum of its parts. | You are on the right track if you mentioned that emergence is a bunch of small things making larger things that have a greater impact than the sum of their parts. In other words, emergence is complexity arising from simplicity. |

Did your answer match the correct (model) answer?

Yes     
  Somewhat     
  No

Fig 2. Externally Interactive Video Design (Source: Kuhlmann et al., 2023)

The video in the image above demonstrates that instructions, questions, and feedback are presented separately from the video. In this design, students have the flexibility to choose the sequence of activities, which tends to be non-linear. This design is in line with the generative principle of activity, namely by carrying out activities after students have watched the video, such as answering questions, summarizing, explaining, and illustrating (Fiorella et al., 2019). Interactivity design is also related to the instructors that appear in the video. The three principles of instructor presentation received the highest rating, namely picture in-picture, writing/typing, and demonstration. These three formats present the instructor directly in the video. The presence of an instructor is considered to help students in video-based learning (Fiorella et al., 2019). The video presentation style that features the instructor is considered more useful by students than presentations in the form of silent visuals and sound only.

### B. Discussion

Cognitive load is one aspect that has been extensively researched related to the use of messages in learning. One indicator of user experience is an ease in the cognitive aspect. The effort to provide a user experience that is not cognitively burdensome is to apply extraneous processing principles. The results of the analysis show that the most widely applied extraneous processing principles are 1) modality, 2) signaling, and 3) segmentation. Modality relates to the use of more than one sense in processing information. Visual and audio elements provide a complete experience rather than visuals alone (Chen & Yen, 2021).

The application of the signaling principle also facilitates

students in easily finding important words or main things from a visual display. Signaling can be used to highlight important information in multimedia. For example, the use of striking colors or animations can attract the user's attention to relevant elements or the main message being conveyed. Engaging animation can also increase motivation and visualize abstract material (Agustini et al., 2019)

This helps users more quickly identify and understand important information in video content (Albus et al., 2021; Mayer, 2012). Students who watch videos judge that the principle of segmentation reduces cognitive load. Perceived cognitive load, mental demands, and frustration are lower than watching non-segmented videos (Lamontagne et al., 2021). Material that is broken down into small segments is more effective in transferring knowledge than students who receive content that is broken down into large segments (Mayer et al., 2018; Prabawa et al., 2024). Instructional videos that have shorter, segmented, and coherent durations and are integrated with learning activities tend to improve student learning outcomes (Fyfield et al., 2022). Regarding the duration and visual design of the video, the duration of the video also gives satisfaction to the audience. The results of the analysis show that short videos have a more positive impact. Videos with a short duration can evoke the emotions of the audience, especially for content that is concise and direct to the main point of the message. Students who watched short videos of less than 5 or 6 minutes achieved higher results and were able to reduce cognitive load than students who watched moderate videos of 6-12 minutes and long videos of > 12 minutes (Yu & Gao, 2022). Video visual design, especially content presentation, also has an impact on

the user experience. Presentation of content in visual form (images) and words (sound or text) makes it easier for audiences to understand the information presented in the video. The more multimedia messages delivered tend to have a better impact on the audience (Cavanagh & Kiersch, 2022; Suwarno, 2020). The presentation of words and pictures in videos also makes it easy for students to process information (Mayer & Moreno, 2003). The interactivity of a video nowadays is important. The video presented not only conveys information but also activates students to think and act. The results of the analysis show that the interactivity in a video refers to the principle of generative activity (Fiorella & Mayer, 2016). During or after watching the video, students are presented with questions, orders to summarize, describe, explain, interpret. This activity will further encourage students to gain a deeper understanding after watching the video. This is in line with the results of the study that it is important to have activities after students watch the video (Mayer et al., 2020). This interactivity provides an active experience for the audience so they don't just passively receive information.

The instructor's role is an important factor influencing student satisfaction when using video. Three types of instructor presentations received the highest rating, namely: picture in-picture, writing or typing, and demonstration. All three models tend to bring the instructor onto the screen and are active. Instructors are not just silent when presenting the material. The presence of the instructor is considered to help students in video-based learning (Fiorella et al., 2019). A video presentation style that features the instructor is considered more useful by students than a voice-only presentation. Combining several presentation styles from different perspectives and angles has been shown to better engage students in the learning environment (De Koning et al., 2018). Instructors who use human voices are also considered better than machine language (google translate, etc.). Instructors who are silent in a video show do not have a positive impact on students. When the instructor writes or draws on the blackboard while explaining the material, it is considered to have a better impact than the instructor being silent and just explaining. Instructors who maintain eye contact with the audience have a better impact than instructors who do not make eye contact with students (Mayer, 2021a, 2021b).

## V. CONFLICT OF INTEREST

There is no conflict of interest presented in the writing of this article.

## VI. AUTHOR CONTRIBUTIONS

All authors have contributed to reviewing articles that research the application of user experience to instructional videos. The researchers reviewed each article and confirmed its suitability for the research objectives. Discussions were

held among the researchers to determine the types of articles that deserved to be reviewed. Furthermore, the researchers jointly calculated the form of user experience in instructional videos,

## CONCLUSION

User experience in instructional videos is related to cognitive, satisfaction, and interaction aspects. The cognitive aspect is realized by applying multimedia principles, especially the principles of modality, signaling, and segmentation. Student satisfaction is measured by the duration of the video and visual design, especially the presentation of content. The video duration that is considered effective is less than 5 or 6 minutes, while the presentation of content tends to be expected by presenting visuals and text (sound) as a whole. Interactivity elements in a video can be realized through generative activities in the form of giving questions, quizzes, and summarizing. The presence of the instructor also affects the user experience of students. Instructors who are actively present in a video show are considered able to influence participants than passive instructors. The implication of the results of this analysis is that in order to create a good user experience in a learning video, it is necessary to pay attention to the cognitive, interactivity, and emotional (satisfaction) aspects of the user. The cognitive aspect is related to the audience's ability to receive information from the video. In this aspect, you need to pay attention to age, maturity, amount of video information, and video duration. The interactive aspect aims to ensure that the video is able to stimulate the audience to be actively involved in the form of summarizing activities, taking notes, taking quizzes, or practicing what is witnessed. The emotional aspect is related to presenting information on a video using a presenter or presenter, including the quality of technical elements such as visual quality, camera techniques, audio, sound, and music. By paying attention to these three things, it is hoped that the audience will be more comfortable and enjoy the information presented in the video.

Thus, the audience will be more comfortable and enjoy the information presented in the video.

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