

Article type

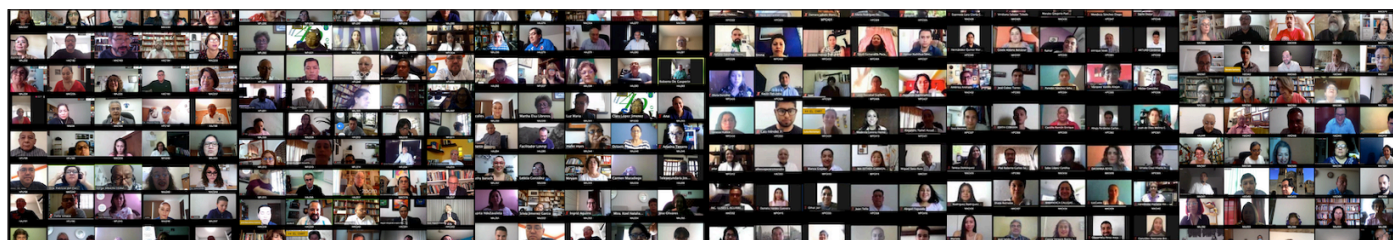
Full paper, double-blind peer review.

Publication history

Received: 12 January 2021, Revised: 20 February 2021, Accepted: 16 June 2021. Online: 07 March 2022.

Cover image

Author.



Special issue Visual literacies and visual technologies for teaching, learning and inclusion | **More at** <https://doi.org/10.21428/8c225f6e.bf2afe2e>

Videoconferences in higher education: The good frame

Alberto Ramírez Martinell

Centre for Research and Innovation in Higher Education, Universidad Veracruzana, Veracruz, México

Keywords

Visual literacy, videoconference, virtual education, academic continuity, higher education, emergency remote teaching

Citation

Martinell, A. R. (2022). Videoconferences in higher education: The good frame. **Studies in Technology Enhanced Learning**, 2(1), 47-63.

<https://doi.org/10.21428/8c225f6e.56c9bc54>

Abstract

The Coronavirus lockdown in 2020 pushed videoconference technology as a common means of synchronous communication for emergency remote teaching in Higher Education. In a short period of time, educators and students had to use cameras and stream their images over the Internet to keep on with academic interaction from home. But not all stakeholders had the same experience using this type of communication means, and their values and perceptions on what was an appropriate framing style for educational purposes yielded different types of camera compositions, not all agreeable to watch. To study videoconferencing framing among University stakeholders, a two-tier intervention was conducted to inquire about the values and perceptions of educators, and to observe the actual production decisions they made before and during a videoconference for educational purposes. In this paper, the video references and framing preferences of 6031 teachers were analysed, and a set of categories were constructed and used to conduct observations of 1111 videoconference frames. The findings were used to understand the production decisions academic stakeholders took for the spontaneous production of their home-made real-time video for virtual classes.

1. Introduction

Structure and order in academic products are highly valued in the context of Higher Education in such a way that a scientific article of relevant content can be rejected from an academic journal if it does not comply with the given formatting criteria. In a less strict fashion, but still causing impact in the audience, electronic presentations with poor visuals or with redundant multimedia elements (Mayer, 2002) may not be considered as good. In the field of web-sites, user friendliness makes the difference in information access, and with regards to video, visual aesthetic impression including colour, shape, motion, spatial layout and depth end up being decisive factors for the viewers to accept the media as one of fine production (Peters, 2007) and with an educational value (O'Donoghue, 2014).

Due to the Emergency Remote Teaching (Hodges, Moore, Lockee, Trust and Bond, 2020) derived from the Coronavirus lockdown, the online activity in education increased in 2020 (CEPAL, 2020), making synchronous communication a common manner of interaction among academic stakeholders either in text or in video-based fashion. However, the spontaneous production of home-made real-time video for virtual classes seemed not to be as straightforward as opening the laptop and turning the web cam on.

Planning the production, finding a good location, anticipating potential problems and even sketching the expected looks of the frame proved to be necessary for educational video production (O'Donoghue, 2014). The preparation of a videoconference in Higher Education relies on several factors. It may include: matters of instructional design (Mayer, 2002); impact evaluation of the aesthetic experience and the attractiveness of media products (Yeh, Yang, Lee, & Chen, 2013); measures of user satisfaction of peer-to-peer-based solutions for real-time video conferencing over the Internet (Chen, Huang, Huang & Lei, 2006; Chen, Chu, Yeh & Huang, 2012); or the assurance of a quality Internet service (Bouch, Kuchinsky & Bhatti, 2000).

The audio-visual language connects to emotions and ideas (Ferres, 1994), thus composition decisions of the producer may impact the students' engagement (Dobrian, Awan, Dilip, Ganjam, Zhan, Sekar, Stoica & Zhang, 2011). A well-produced video is easy to watch. It provides the right information and portrays the expected elements. A good video inherits the square shape of television shows, and due to the screen layout of a desktop computer and the software used to access videoconferences, it is the horizontal orientation that is found to be the more acceptable to watch

(Canella, 2018). Besides the shape and orientation of the frame, videoconferences may follow the style of a reader in a news programme who is portrayed sitting still behind a desk, and in a solemn fashion talks directly to the viewers. This type of broadcasting style usually locates the speaker in the centre of the frame, looking directly to the camera, with a fair amount of space above the head and the sides, with a proper background. The context of the speaker can be either a virtual backdrop, a library, an office or for the case of remote teaching a room of the house. In all cases, tidiness in the frame makes a difference.

To compare the values, preferences and actual decisions that Higher Education academic stakeholders have about video framing and composition for videoconference teaching, the opinions of six thousand scholars were analysed and one thousand camera images were then categorised to find the vast variety of framing types used during the first months of the lockdown in Mexico.

2. Video in education

The story of the relationship between video and education is not new. Its roots are in the second half of the twentieth century, when several governments around the world saw educational broadcasting as a means of inclusion. After the second World War the governments in Europe developed audio-visual policies and methodologies for an educational broadcasting system (Flores, 2008). In USA, the first non-commercial educational television (ETV) station was established in May 1953 and like other ETVs that appeared in the following years, they aired mainly to local areas, schools, colleges and universities (Federal Communications Commission, 1968). In Latin America, it was Venezuela in 1952 which was the first country to adopt educational broadcasting. 15 years later Telesecundaria, a broadcasting television programme for grades 7th, 8th and 9th, started in Mexico, and in 1980 reached grades 10th, 11th and 12th as Telebachillerato (Dorantes, 2015). Since their creation, both programmes have aimed to reach young people in rural towns with less than 2500 inhabitants (Palmero & Longares, 2002).

Besides educational broadcasting, videotaped education has also played an important role in teaching and learning with media (Casillas & Ramirez, 2015). Language teaching, for instance, used videotapes to bring to the classroom situations and audio in the target language that were otherwise difficult to present to the students (Borromeo, Fernandez & Ramirez, 2018). Continuing education and corporate in-house programmes also used videotapes to

share teaching materials (Maneshian, 1981), and with the advent of computers, analogue video went digital first, and with the massive connection to Internet, the general use of video, included in the educational context, exploded (Ramirez, 2010).

In the mid 1990's, the learning ecosystem of non-conventional teaching in Higher Education, added to the real-time communication options the multipoint video conference (Garcia & Calderon, 2009). Its employment was not widespread across the campus, and to use it, academic stakeholders needed to schedule an appointment and let the staff set up the connection, arrange the camera and achieve a frame typically similar to that of a news reader in Television.

Around the year 2000 the academic community got closer to videoconferencing by means of broadband internet and desktop services. The connectivity and setup of this type of videoconference depended on the software and on the specifications of the personal computer that the scholars had, and in more independent fashions, they could use the technology to connect with other peers. Finholt and colleagues (1999) reported their use of NetMeeting for academic conversations across sites in the framework of a geographically distributed research project; and the teams of Swamy (2002) and Feisel (2005) showed the software to be useful for accessing and enabling communication for Internet-based Labs.

Video calling software refined in two decades. Internet became more accessible and stable, and desktop solutions for group video calls such as CU-SeeMe, QuickCam for Mac, Cisco Webex, Skype, FaceTime, Google Meet, GoToMeeting, Jitsi.org, Microsoft Teams, Zoom or even Twitch, became part of an emerging digital culture.

In the first months of 2020 the pattern of videoconference employment changed in frequency and users' type. The Coronavirus lockdown urged academic work to move to virtual spaces and within days, educators and students –with resolved access to Internet and personal computers– started to use video calling software for real-time communication.

We are Social and HootSuite indicated in their reports that video-based services such as TikTok and Instagram reached 800 million users a month in the first term of the year 2020 (Kemp, 2020), and Forbes pointed TikTok as the most downloaded app of the trimester (Brown & Chmielewski, 2020). In the field of productivity software, the trend for videoconferencing systems is similar. Zoom is an example of this behaviour. In December 2019 the video conferencing platform had 10 million users and in April 2020 it reached 300 million (Manzoor, 2020).

2.1 Visual literacy

Static and dynamic images in the digital age have become not only more frequent but more diverse either in purpose or in format (Cassany, 2006). Price reduction, streaming technologies, the social presence of camera, a more stable and accessible Internet and a set of cultural dispositions and trends helped asynchronous digital video gain popularity for entertainment, social and educational purposes (Yan, 2015). Synchronous video did experience a nuanced faith at first but with the Coronavirus lockdown in 2020 its use spread for real-time communication purposes in the social, working and educational contexts (CEPAL, 2020).

In a few days, teachers and students from all academic levels had to incorporate software using patterns, techniques and strategies for participating in videoconferences. For Mexican Higher Education Institutions, Zoom, Google Meet, Jitsi.meet, Microsoft Teams and Webex became common tools for the continuity of education (IISUE, 2020).

This change in instruction challenged teachers and students as well. Access, use and appropriation differences were first expected (Crovi, 2009) and then analysed (Chambi-Mescoco, 2020; Garcia, Abella, Corell, & Grande, 2020; Lestiyawati, 2020, Orhan, & Beyhan, 2020). These studies pointed out that beyond the technical complications and the differences in the digital knowledge set that Higher Education stakeholders may have (Casillas & Ramirez, 2021), it was visual literacy that needed further investigation.

Visual literacy refers to the appropriation of values and perceptions that people have to construct or interpret static or dynamic visual elements in print or digital formats. New literacies have been studied by different authors (Scribner & Cole, 1981; Kalman, 1999; Lankshear, Gree, Knobel & Searle, 1997; Barton & Hamilton, 1998, 2004; Gee, 1999; Kress, 2003; Cassany, 2006, 2011; Hernandez, 2014, 2016; Aguilar, Ramirez & Lopez, 2014; Ramirez & Casillas, 2017; Ramirez & Aguilar, 2021) who have seen them as developed capabilities employed to enable people to decode social constructed messages formed by symbols, signs and digital elements which, for the case of visual literacy, are contextualized in visually rich environments (Goodwin, Demetrius & Uhrmacher, 2019).

Reading images is not easy as some have claimed (Sartori, 1998). It requires a series of critical criteria and cultural information to either appreciate the image itself or to unravel its messages. Producing images, on the other hand, may be even more complex than decoding them. To generate either a static or dynamic image, the producer

needs planning of several elements including the visual one (Gerber & Pinochet, 2012).

With the visual grammar from television and online media as reference (Cha et al, 2007) and the hardware design as restriction, the videoconference producer engages in the preparation of the streaming session which may include moving books, art pieces or plants inwards and outwards the frame; adjusting the camera level and angle and validating the look of oneself in the screen.

In the educational context, solemnity is common, as well as full respect for the common communication protocol, which in videoconference represents turn-taking and the activation and deactivation of camera and microphone. Excessive and drastic movements during the videoconference either of oneself or of the camera itself are undesirable as well as an untidy context and a poor illuminated frame (Ramirez & Aguilar, 2021).

3. Methodology

In the new normal, Higher Education stakeholders resorted to videoconference for media-rich synchronous communication sessions, but their level of use were not homogeneous. The values, perceptions and decisions about presenting themselves in a video frame were diverse. The current intervention has two descriptive parts. The first, explores the perceptions of over six thousand academic stakeholders on videoconferences for educational purposes, and the second part revolves around the categorization of the actual frames that over one thousand academic professionals used in either web seminars, remote academic meetings or in synchronous video-rich Higher Education classes.

3.1 Informants

The information of two groups of academic stakeholders were gathered for the analyses herein presented in two different situations. The first group was registered in a Massive Online Open Course that the author of the article designed and procured in the first semester of 2020. One of the activities of the course was to produce a video. And for reflexive purposes, participants were invited to answer seven questions about composition and framing. From 20,000 participants, 6031 decided to respond to the multiple-choice instrument.

For the second part of the intervention, 1111 stills of desktop videoconference individual cameras were captured and categorized for further analysis (Ramirez & Aguilar,

2021). The images were gathered during the first three months of the lockdown in Mexico, that officially started on March 23rd, 2020. All of the images were personally collected from Higher Education events in Mexico for the sole purpose of conducting the current research.

3.2 Analysis of videoconferences

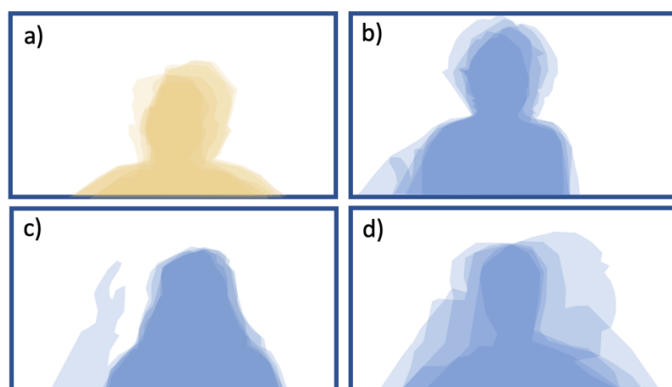
To gather the information from the videoconferences, an analysis of the changes within the frame was conducted. A dozen videos were observed from start to finish and, unless the videos were filmed with smartphones, a series of contextual elements of the frame such as plants, curtains, art and bookcases remained constant. It was not infrequent that the person's movement within the frame tended to be discreet. The changes of position, the flickering and the use of hands while speaking did not affect the layout of the frame. This was made evident with a polygonal halo generated with translucent figures traced over the person whenever a change of position happened, see Figure 1.

Figure 1. Motion analysis within a given frame



The halo from the study revealed that the motion pattern in the videoconferences was incipient, so analysing a single frame of the material was representative, see Figure 2 where motion patterns of four different videoconferences, i.e. the halo types, are shown. In the upper left corner, a) shows a person that barely moved during the session. Due to the use of the speakers' hands, movement patterns b) and c) expanded. And finally, pattern d) portrays a wider halo due to the leaning movements of the speaker. All four cases reveal that despite the use of the hands and the leaning movements of the speaker the composition of the frame tends to be static in desktop videoconferencing.

Figure 2. Motion patterns of four different videoconferences



3.3 Ethics

During the streaming of academic events, generally, the video images of speakers and delegates go public as well as those of the attendees to the academic meetings; and, in a narrower way, those of online classes too. This shows an opportunity to regulate policy and rights related to the streaming and storage of the image of academic stakeholders that participate in a live video session.

Anonymity in the surveys is easy to handle but the identity of the 1111 people that appeared in the frames, also needed to be warranted. Their identity was protected all the time and by all possible means. Frames were shrunk, blurred and decoloured; and when a name appeared in the frame, it was cropped. Furthermore, to reduce the possibility of identification, dates and names of the academic events were not added to the database nor mentioned in the publications derived from the research.

4. Results

The composition of a videoconference frame for educational purposes can be studied from different standpoints. The personal perceptions and the actual production decisions are two of them. The analyses of the videoconference frames are presented, here, in two parts. In the first one, what 6031 teachers think of videoconference framing in education is studied. Then, an analysis of the categorization of 1111 frames shows the actual capabilities of academic stakeholders.

4.1 Frame perceptions

The analysis of videoconference framing layouts in this research follows three considerations: the camera angle, the shot size and the position of the speaker. The camera angle depends on the location of the camera with regards to the speaker. Three possible types of shots can be produced. If the video capturing device is located above the person, a high angle shot is generated. If it is below the person, a low angle shot is obtained, and the third type of possible shots is when the camera is level with the person's eyes. The three types of shot sizes depend on the distance that separates the camera from the person, either too close, too far, or a shot where the person's bust is framed with the right amount of air above the head and no cropping occurs. The third factor of analysis is the position of the speaker in relation to the frame. Besides being in the centre of the frame, the person can appear to either one of the sides, to the top or to the bottom of the square. The combination of these variables for the production of spontaneous home-made desktop video, may yield up to 256 different frames. However, due to their popularity, eight types were selected to categorise the observation. The categorization of the frames is as follows:

- Frame A is achieved with a levelled angle of a camera that is far from a centred person in the horizontal axis but positioned at the bottom of the frame.
- Frame B portrays a centred person filmed with a levelled camera located at a good distance.
- For frame C the speaker was captured at the extreme right of the square, at a good distance of a well levelled camera.
- Frame D was shot with a vertically held smartphone. The person is vertically and horizontally centred in the frame, but too close to the camera.
- Frame E is horizontally centred but shot from above. The person appears to be small and besides is located at the bottom of the square.
- In frame F the person is too close. She appears to be big for the frame, even her head and shoulders are cut, though she is centred and well-levelled.
- For frame G the speaker is at the extreme left of the square, her body is cut, though the camera is well levelled and at a good distance.
- Frame H is a high angle shot achieved with a smartphone horizontally held. The speaker is centred at a good distance, but her head was cut.

A systematic characterization of the eight frames is shown in Table 1.

Table 1. Frame description

| | Camera angle | Shot size | Position of the speaker |
|---|-----------------|------------|----------------------------------|
| a | Levelled | Too far | Centre - bottom |
| b | Levelled | Right size | Centre – centre |
| c | Levelled | Right size | Right – centre |
| d | Levelled | Too close | Centre – centre – smartphone |
| e | High angle shot | Too far | Centre – bottom |
| f | Levelled | Too close | Centre – top – cut |
| g | Levelled | Right size | Left – centre – cut |
| h | Levelled | Right size | Centre – centre – cut smartphone |

Table 2. Students' framing layouts

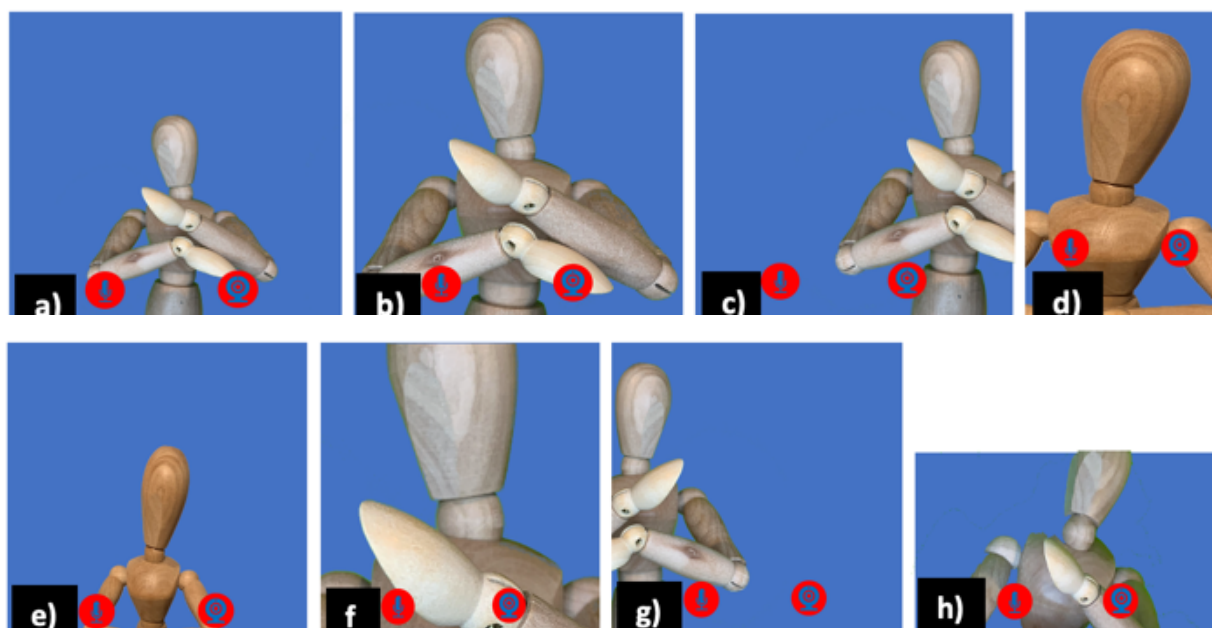
| | a) | b) | c) | d) | e) | f) | g) | h) | blank |
|------------------|------|------|------|------|------|------|------|------|-------|
| Students' frames | 15% | 14% | 9% | 17% | 15% | 10% | 8% | 12% | 0% |
| | 1785 | 1736 | 1040 | 2039 | 1843 | 1253 | 1031 | 1482 | 0 |

Table 3. Most and least preferred frames for a presenter

| | a) | b) | c) | d) | e) | f) | g) | h) | blank |
|-------------------------|------|------|-----|-----|------|------|------|-----|-------|
| Most preferred frames: | 21% | 45% | 3% | 3% | 21% | 1% | 1% | 1% | 6% |
| b) a) e) | 1239 | 2722 | 160 | 178 | 1257 | 44 | 38 | 35 | 358 |
| Least preferred frames: | 3% | 4% | 2% | 9% | 4% | 37% | 20% | 15% | 7% |
| f) g) | 186 | 238 | 149 | 519 | 224 | 2219 | 1196 | 889 | 411 |

Table 4. Teachers' preference for framing oneself

| | a) | b) | c) | d) | e) | f) | g) | h) | blank |
|-----------------------|------|------|-----|-----|------|----|-----|----|-------|
| Teachers' preferences | 1535 | 1963 | 307 | 244 | 1017 | 58 | 109 | 87 | 711 |
| | 25% | 33% | 5% | 4% | 17% | 1% | 2% | 1% | 12% |

Figure 3. Eight different type of frames

The eight types of frames that were presented to the 6031 teachers were modelled with a jointed wooden drawing mannequin, see Figure 3.

4.1.1 The inquiry

In the framework of a Massive Online Open Course (MOOC) an optional seven-question instrument was made available to nearly 20,000 participants, from which 6031 decided to give their answers. Three different types of situations were considered for the inquiry. In the first, the teacher was asked about the perception she has about her students' frames. In the second situation, the questioning was oriented to the perception of a presenter, and in the third one as the teacher who needs to portray herself in the videoconference. To visualise the distribution of the answers, the frames from Figure 3 are referenced.

4.1.1.1 Students' framing layouts

To answer the question about the students' framing styles, the informants responded in a seemingly even manner, see Table 2. Although the top three frames were d) with 17%, and a) and e) with 15% each, the standard deviation of the eight frames is 3.1% which suggests that the camera layouts that students used were diverse and evenly accepted. Layouts b) h), f) and c) had 14%, 12%, 10% and 9% of the votes respectively.

4.1.1.2 The most and least agreeable frames to watch in a speaker

The most agreeable frame to watch, for a speaker, is frame b) with 45% of the responses, followed by frames e) and a) with 21% of the answers. Frames f), g) and h) were the least frequent of the group with less than 1% of the responses which is coherent with the answers of the second question that directly inquiries about the least preferred frames of the informants. 37% of the responses pointed at frame g) as the worst framing option, followed by frames e) and f) with 20% and 15% respectively. 11% of the people said that frames type b), a) and e) were also bad decisions which shows hesitation on the matter. Table 3 and Figure 4 show data distribution of the two questions about the presenter's framing.

4.1.1.3 Personal framing decisions

As a home-made spontaneous real-time video producer, one needs to make a decision on how to orient the layout of the videoconference frame. Some design aspects can be barely manipulated, such as the height of the web cam when it is integrated into a laptop. However, the presenter can make slight corrections to the frame when she sees herself on the screen. When asked about the type of frame they want to have for a videoconference, from the eight options they picked frames b) with 33%, a) with 25% and e) with 17% as their most preferred framing styles. The least common frames with less than 1% were f) and g), see Table 4.

Figure 4. Most and least preferred frame for a speaker

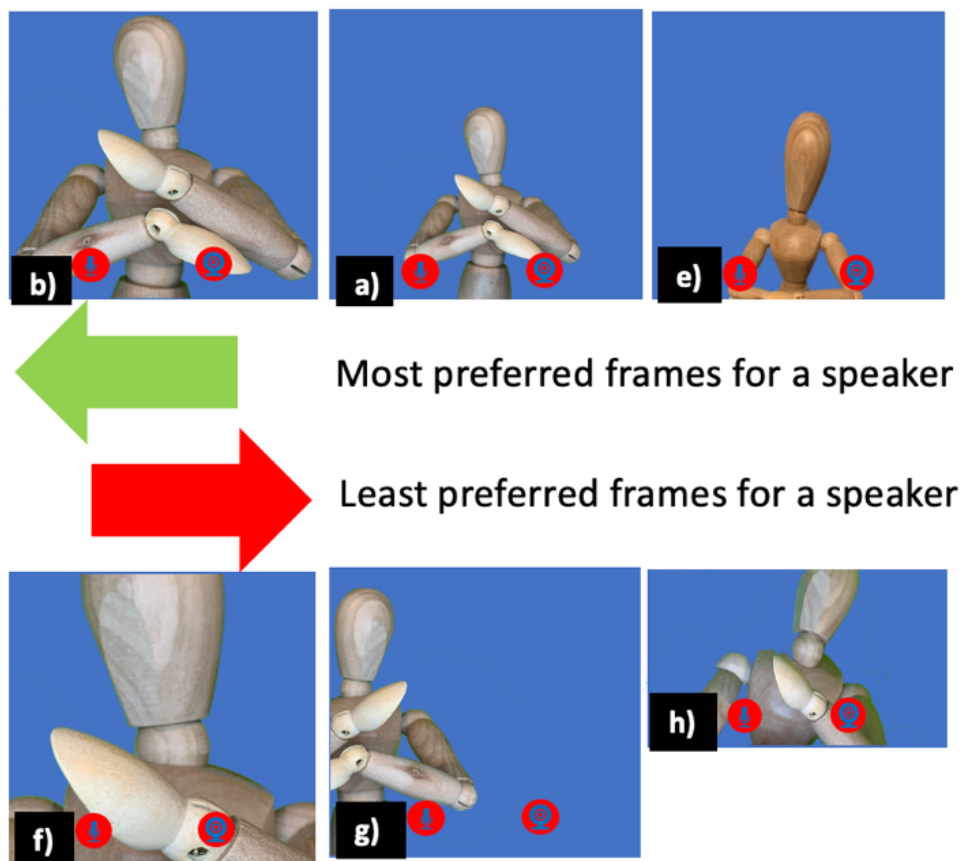


Figure 5. The two most accepted layouts for framing an active speaker in a videoconference

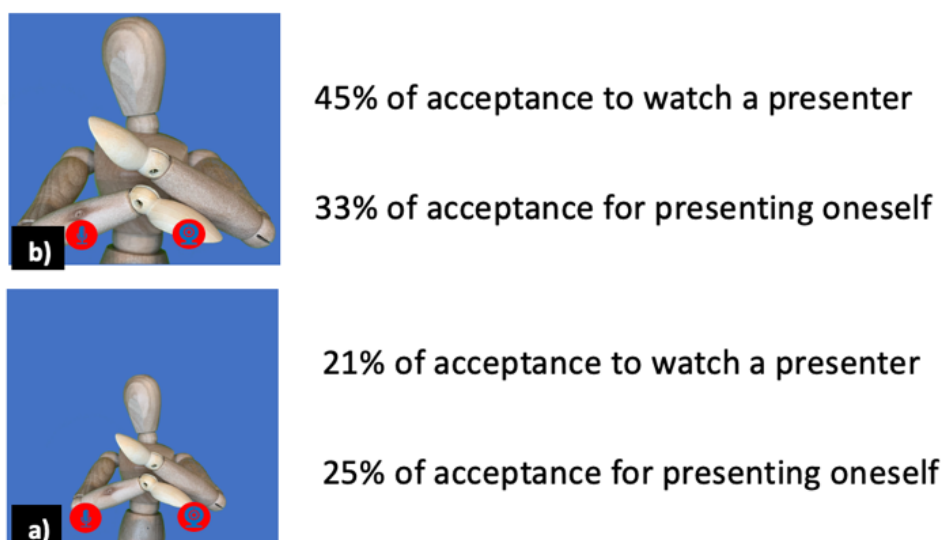
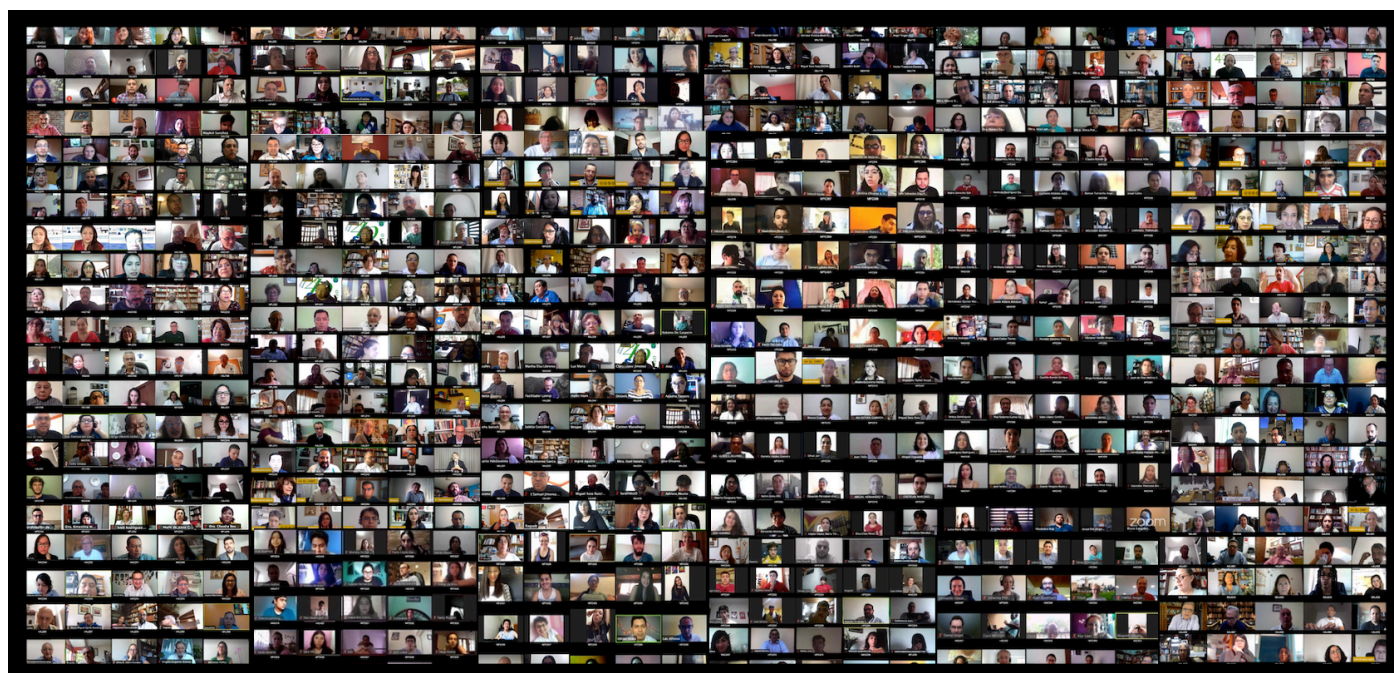


Figure 6. The 1111 stills of participants



The two most popular frame layouts are b) and a). For watching a person, the most popular frame is b) with 45% of acceptance. Frame a) has 21%. For framing oneself, the type b) has 33% of acceptance and a) 25%, see Figure 5.

4.2 Actual frames

To observe the actual framing decisions that educational practitioners made in videoconferences, a set of 1111 frames of Mexican educators and students that participated either in staff meetings, online webinars or in remote synchronous classes, were captured during the first three months of the Coronavirus lockdown. A detailed analysis of the video frames and the production criteria that educational practitioners employed is discussed in a different piece of work (Ramirez & Aguilar, 2021). As a way to illustrate the work conducted, a collage with all frames is presented in Figure 6 showing the 1111 stills of participants.

To analyse the composition of the videoconferences rather than going through complete videos with constant moving patterns, a single still of the session was first captured in the database and then analysed. The dimensions, variables and indicators used in the intervention as well as the frequency of each indicator are shown in Table 5.

4.2.1 The good frame

From the opinions and perceptions that educators shared about videoconference composition and framing, we learned that frames type b) and a) shown in Figure 3. are valued as the most agreeable and best compositions. Frames b) and a) can be described by means of the indicators mentioned in Table 5.

The categorisation of the good framing is as follows. From the person dimension, the attitude is to be active. Sex and type of meeting are unimportant. From the framing layout dimension, the shot is expected to be right sized, well-illuminated and levelled to the eyes of a speaker who appears in the centre of a frame. From the context dimension, the place is not relevant as far as it is tidy and with elements that add up to the context such as books, plants or paintings hanging on the wall. The use of virtual backdrops is not badly seen.

When conducting analyses of the frames separating the dimensions. It can be observed that producers considered some of the features for achieving a good frame similar to frame type b). From the personal dimension 61.6% had an active attitude and 75.3% were looking at the camera. From the frame dimension, 54.3% had a shot levelled to the eyes; 60.2% achieved a frame of the right size, 60.5% located themselves in the centre of a frame; and 58.2% procured good lightning for the videoconference. From the context

Table 5. Operationalization of the variables

| Dimension | Variable | Indicator | Percentage |
|----------------|-------------------------|----------------------------|------------|
| Person | Sex | female | 57.20% |
| | | male | 42.80% |
| | Attitude | active | 61.60% |
| | | passive | 38.40% |
| | Direction of the eyes | to the camera | 75.30% |
| | Type of meeting | conference or class | 63.00% |
| | | academic meeting | 36.80% |
| Framing layout | Capturing device | smartphone | 8% |
| | Camera angle | high angle shot | 17.10% |
| | | low angle shot | 28.20% |
| | | levelled to the eyes | 54.30% |
| | Shot size | too far | 29.60% |
| | | too close | 9.60% |
| | | right size | 60.20% |
| | Position of the speaker | centre | 60.50% |
| | | towards one side | 37.80% |
| | | to the op | 25.40% |
| | | to the bottom | 31.60% |
| | | cut | 31.20% |
| | Lightning | good | 58.20% |
| | | incorrect | 19.00% |
| | | backlighting | 19.40% |
| Context | Place | office | 67.80% |
| | | bedroom | 8.00% |
| | | kitchen | 0.50% |
| | | living room or dining room | 18.80% |
| | | outside | 1.40% |
| | Contextual elements | books and paintings | 32.90% |
| | | backdrop | 3.20% |
| | Setting | tidy | 89.70% |

Figure 7. Good frames identified

dimension, 89.7% were portrayed in a tidy setting; and 32.9% left in the frame elements that add up to the context such as books, plants or paintings hanging on the wall. However, when considering the three dimensions together to analyse the frames, the number of good frames –in the form of type b) frame– reduces. Only 56 people (5% of the 1111 frames) achieved an image that complies with all the characteristics of a good frame. Figure 7 shows the 56 images of the videoconferences that achieved a frame b) type of composition.

4.3 Best practices

To learn from the experience and practice of academic professionals that have participated in videoconferences, an observation of the issues and framing opportunities of educators is presented in this section. First, a brief comment on the framing situation is presented, followed by the percentage of subjects in the sample. Almost 80% of the 1111 frames presented some framing issues that are explained next by means of the positions of the jointed wooden drawing mannequins shown in Figure 3.

4.3.1 Distance between the person and the camera

In 16% of the cases the person appears too close to the camera, as in frame type f). This makes the impression that the person is too big and does not fit in the frame, thus some parts, like the head or the chin are cropped. Figure 8 shows the type of frame with the outline of six actual stills that correspond to the type.

Although frame a) was considered as one of the best compositions in the survey by the 6031 academic stakeholders, it was only used in 2% of the 1111 videoconferences.

In frame a) the person appears to be small in relation to the size of the square however it is not the best framing selection, see Figure 9.

4.3.2 The speaker's position

Locating oneself on either side of the video square may not always be problematic, but when it is too extreme, the person's image can be cut in undesirable manners. Frames c) and g) show the person positioned on one of the sides of the square, either the left one (10%) or the right one (2%), see Figure 10.

4.3.3 Camera position

The location of the camera is also important. If located below the level of the eyes as in frame h) the person looks too tall for the frame. 6% of the videoconferences used this type of composition. The other problem is when the camera is located above the level of the eyes as in frame e) where the person looks too small. 16% of the squares analysed had this type of issue, see Figure 11.

4.3.4 The vertical frame of a handheld device

Characterised with type d), the vertical frame achieved with a handheld device was seen in 6% of the cameras. Although 22% of the users resorted to smartphones or tablets for their conferences, 16% stuck to the horizontal layout. The vertical composition is fine for a smartphone-to-smartphone call, but when it is the case of a desktop videoconference, the horizontal frame is more appropriate, see Figure 12.

Figure 8. Frame type f), too close to the camera



Figure 9. Frame type a), with air above the head



Figure 10. Frame type h), a smartphone layout

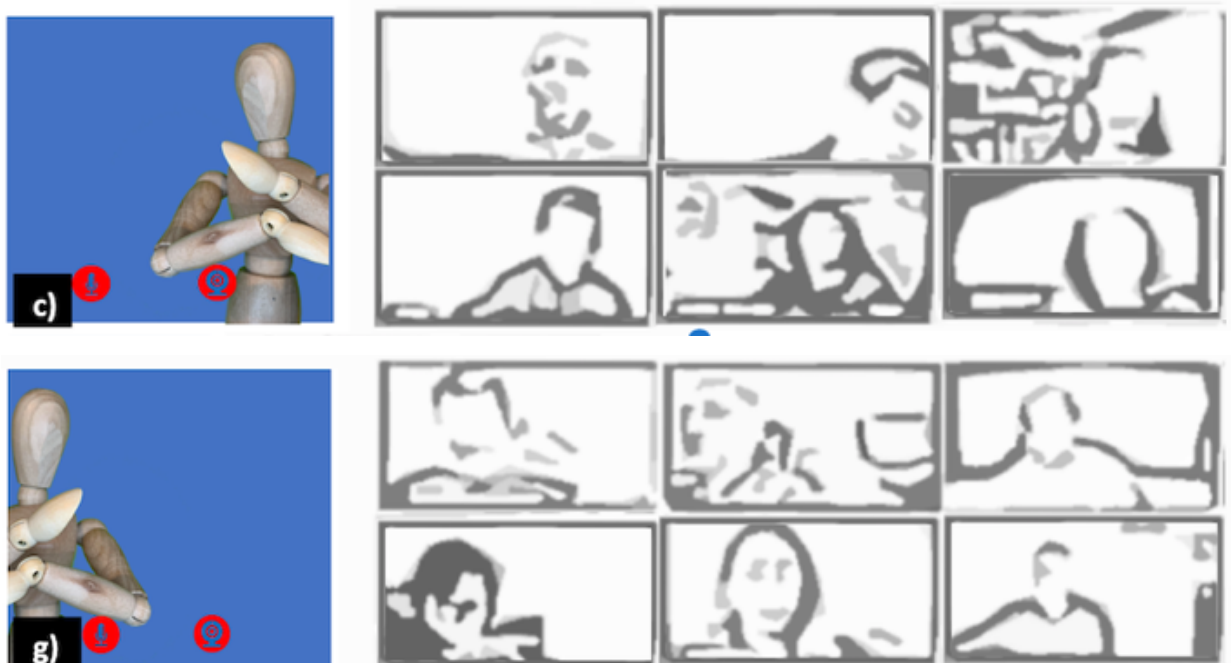


Figure 11. Frame type e), from top to bottom



Figure 12. Frame type d), the new framing



Figure 13. Frame type b), the good frame



4.3.5 The best frame

According to the informants' opinions and the actual production decisions, frame type b) shown in Figure 13, is one of the most agreeable frames to watch in a video conference. It is a frame with good camera angle, distance and speaker's position. It combines aesthetic and technical considerations and achieves a harmonic composition to watch with an acceptable layout that leaves fewer space for unnecessary criticism of body parts cutting or the arrangement of the person. Frame type b) is the target to achieve in a videoconference. It resembles the common perspective that speakers have in face-to-face conversations and that of a news programme reader.

5. Discussion

After several months of using videoconference for remote teaching in Higher Education, the spaces in the house where it usually takes place became less emergent. And the more we have used a videoconference setting, the more likely we are to realise that our image, production decisions and framing are either correct or improvable.

As with written academic products, learning from good practices and following formatting standards for video-based communication within the educational context adds value and quality to the videoconferencing lessons in Higher Education. A good frame shows respect to the viewer, the content and the profession.

The correct framing of the speaker in a videoconference helps to keep the focus on the educational message. So, engaging in its production is not only a matter of aesthetics but of good communication as well. It was observed that good framing requires reflexion and preparation. The integration of a web camera, to most of the desktop equipment that teachers use, does not always produce the best frame. As presented before, point-and-shoot did not work in more than half of the cases. The findings of this study show that a certain level of planning and preparation for a videoconference is required. There are several variables that need to be considered before and during a desktop videoconference. In this paper they were presented as three research dimensions: the person, the frame and the context, but further work about the relation of framing and its impact in conveying a learning message in Higher Education is still pending.

It has been seen for the first dimension that the attitude and even the direction of sight are important variables to pursue in the person that appears on the screen, especially if

she is the speaker. A sensation of proximity may be generated and the viewers' engagement may increase. For the frame dimension, it was observed that the television grammar has some influence on viewers perceptions towards the acceptance of what can be considered as a good frame, but the impact was less noticeable when teachers were producing their own video. About the context, it was observed that keeping the place tidy with the right elements in the frame ends up helping the viewer to engage.

Although 25% of the frames did not fall into any of the categories of the study and were not analysed, the eight frames proposed for the intervention were useful to engage in the observation of the layouts of videoconferences in the framework of the emergency remote teaching in Higher Education that occurred in 2020 because of the Coronavirus lockdown. This framework of analysis allowed us to see that the production decisions and perceptions of academic stakeholders with regards to videoconferences were far from good framing. This could find its rationale in a production underestimation, lack of visual awareness or in low visual literacy. If videoconference is here to stay, so is aiming to reach the good framing style.

References

- Aguilar, J., Ramirez A. & Lopez, R. (2014). Literacidad digital académica de los estudiantes universitarios: Un estudio de caso. *REID*. 11, 123-146. <https://revistaselectronicas.ujaen.es/index.php/reid/article/view/1257>
- Barton, D. & Hamilton, M. (1998). Literacy practices. In Barton D., Hamilton, M. & Ivanic, R. (Eds.). *Situated literacies. Reading and Writing in Context* (pp. 7-15). Routledge.
- Barton, D. & Hamilton, M. (2004). La literacidad entendida como práctica social. In V. Zavala, M. Niño-Murcia & P. Ames (Eds.), *Escritura y sociedad. Nuevas perspectivas teóricas y etnográficas* (pp. 109-139). Red para el desarrollo de las ciencias sociales en el Perú.
- Borromeo, C., Fernández, J., & Ramirez, A. (2018). La tecnología en la enseñanza de idiomas. *Reencuentro. Análisis De Problemas Universitarios*, 30(76), 133-154.
- Bouch, A.; Kuchinsky, A.; & Bhatti, N. (2000, April). *Quality is in the eye of the beholder: Meeting users' requirements for internet quality of service*. SIGCHI Conference on Human factors in Computing Systems.

- Brown, A. & Chmielewski, D. (2020, May 21st). Tras la caza del nuevo CEO de TikTok y lo que sigue para la aplicación del momento. <https://www.forbes.com.mx/negocios-tras-la-caza-del-nuevo-ceo-de-tiktok-y-lo-que-sigue-para-la-aplicacion-del-momento-en-el-mundo/>
- Canella, G. (2018). Video goes vertical: Local news videographers discuss the problems and potential of vertical video. *Electronic News*, 12(2), 75–93. <https://doi.org/10.1177/1931243117705417>
- Casillas, M., & Ramirez, A. (Coords.) (2015). *Génesis de las TIC en la Universidad Veracruzana: Ensayo de periodización*. Productora de Contenidos Culturales Sagahón Repoll.
- Casillas, M., & Ramirez, A. (2021). *Saberes digitales en la educación: Una investigación sobre el capital tecnológico incorporado de los agentes de la educación*. Editorial Brujas.
- Cassany, D. (2006). *Tras las líneas. Sobre la lectura contemporánea*. Anagrama.
- Cassany, D. (2011). *En Línea. Leer y escribir en la red*. Anagrama.
- CEPAL, N. (2020). La educación en tiempos de la pandemia de COVID-19. CEPAL UNESCO. https://repositorio.cepal.org/bitstream/handle/11362/45904/S2000510_es.pdf?sequence=1&isAllowed=y
- Cha, M., Kwak, H., Rodriguez, P, Ahn, Y., & Moon, S. (2007, October). *I tube, you tube, everybody tubes: Analyzing the world's largest user generated content video system*. 7th ACM SIGCOMM conference on Internet measurement.
- Chambi-Mescoco, E. (2020). La videoconferencia como recurso educativo en los tiempos del COVID-19. *Investigación en educación médica*, 9(36), 108-109. <https://doi.org/10.22201/fm.20075057e.2020.36.20267>
- Chen, K. T.; Huang, C. Y.; Huang, P; & Lei, C. L. (2006). Quantifying skype user satisfaction. *ACM SIGCOMM Computer Communication Review*, 36(4), 399-410. <https://doi.org/10.1145/1151659.1159959>
- Chen, C., Chu, C., Yeh, S., Chu, H., & Huang, P (2012). Measuring the perceptual quality of Skype sources. *ACM SIGCOMM workshop on Measurements up the stack*. Association for Computing Machinery. <https://doi.org/10.1145/2342541.2342543>
- Crovi, D. (2009). Acceso, uso y apropiación de las TIC en comunidades académicas. Diagnóstico en la UNAM. UNAM/Plaza y Valdés.
- Dobrian, F, Awan, A., Dilip, A. J., Ganjam, A., Zhan, J., Sekar, V, Stoica, I., & Zhang, H. (2011). Understanding the impact of video quality on user engagement. *ACM SIGCOMM Computer Communication Review*, 41(4), 362-373.
- Dorantes, M. (2015). *Desarrollo Integral del estudiante en el Telebachillerato*. Secretaría de Educación de Veracruz. Dirección General de Telebachillerato de Veracruz. Mexico.
- Federal Communications Commission (1968). *Educational Television*. Inf. Bulletin No. 16-B. Washington. <https://files.eric.ed.gov/fulltext/ED063786.pdf>
- Feisel, L. D., & Rosa, A. J. (2005). The role of the laboratory in undergraduate engineering education. *Journal of Engineering Education*, 94(1), 121-130. <https://doi.org/10.1002/j.2168-9830.2005.tb00833.x>
- Ferres, J. (1994). *Vídeo y educación*. Papeles de pedagogía. Paidós.
- Finholt, T. A., Rocco, E., Bree, D., Jain, N., & Herbsleb, J. D. (1999). NotMeeting: A field trial of NetMeeting in a geographically distributed organization. *ACM SIGGROUP Bulletin*, 20(1), 66-69.
- Garcia, F. J., Abella, V, Corell, A., & Grande, M. (2020). La evaluación online en la educación superior en tiempos de la COVID-19. *Education in the Knowledge Society (EKS)* 21(26).
- Garcia, R. E., & Calderon, R., (2009). Sistema de educación multimodal en la Universidad Veracruzana. *X Congreso Nacional de Investigación Educativa*, Mexico.
- Gee, J. (1999). *The New Literacy Studies and the "Social Turn"*. <https://files.eric.ed.gov/fulltext/ED442118.pdf>
- Gerber, V & Pinochet, C. (2012). La era de la colaboración. Mapa abreviado de nuevas estrategias artísticas. In N. Garcia-Canclini, F. Cruces, F. & M. U. Castro (coords.). *Jóvenes, Culturas Urbanas y Redes Digitales*. Spain: Ariel, Colección Telefónica.
- Goodwin, D., Demetrius, A., & Uhrmacher, P B. (2019). Responding and connecting: Visual literacy for today using the mid-20th-century ideas of artist and educator

- Kurt Rowland. *Art Education*, 72(3), 39–44. <https://www.proxydgb.buap.mx:2168/10.1080/00043125.2019.1578021>
- Hernández, D. (2014). La apropiación digital. Descripción y análisis de las TIC en las prácticas letradas de adultos profesionales mexicanos [Doctoral dissertation, Universidad de Pompeu Fabra, Barcelona, Spain].
- Hernández, D. (2016). Los aventurados en el espacio digital: Desde la máquina de escribir al correo electrónico. *Ensayos Pedagógicos*, 11, 113-119. <http://www.revistas.una.ac.cr/index.php/ensayospedagogicos/article/view/9343/11194>
- Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *Educause review*, 27, 1-12. <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning>
- IISUE. (2020). *Educación y pandemia. Una visión académica*. Mexico: UNAM. https://www.iisue.unam.mx/investigacion/textos/educacion_pandemia.pdf
- Kalman, J. (1999). *Writing on the Plaza: mediated literacy practices among scribes and clients in Mexico City*. Hampton Press.
- Kemp, S. (2020). *Digital 2020. Digital global Overview*. <https://datareportal.com/reports/digital-2020-global-digital-overview>
- Kress, G. (2003). *Literacy in the New Media Age*. Routledge.
- Lankshear, C., Gee, P., Knobel, M., & Searle, C. (1997). *Changing Literacies*. Open University Press.
- Lestiyawati, R. (2020). The strategies and problems faced by Indonesian teachers in conducting e-learning during COVID-19 outbreak. *Culture, Literature, Linguistics, English Teaching*, 2(1), 71-82. <https://ojs.unsiq.ac.id/index.php/cclient/article/view/1271>
- Manzoor, I. (2020). Zoom Revenue and Usage Statistics [Blog]. *Business of apps*. <https://www.businessofapps.com/data/zoom-statistics/>
- Mayer, R. E. (2001). *Multimedia learning*. Cambridge University Press.
- O'Donoghue, M. (2014). *Producing video for teaching and learning: Planning and collaboration*. Routledge.
- Orhan, G., & Beyhan, Ö. (2020). Teachers' perceptions and teaching experiences on distance education through synchronous video conferencing during Covid-19 pandemic. *Social Sciences and Education Research Review*, 7(1), 8-44.
- Palmero, M., & Longares, L. (2002). La telesecundaria en México. Un ensayo sociopedagógico para la inclusión y la igualdad de oportunidades de las comunidades rurales. *Revista de Ciencias de la Educación*, 192, 407-417.
- Peters, G. (2007). Aesthetic Primitives of Images for Visualization. *11th International -Conference Information Visualization (IV '07)*, Zurich, Switzerland, 316-325.
- Ramirez, A. (2010). *Educational Video. Exploring the complex relationship between production, educational use and audience*. Verlag Dr. Mueller.
- Ramirez, A. & Casillas, M. A. (Coords.) (2017). *Saberes digitales de los docentes de educación básica. Una propuesta para la discusión desde Veracruz*. Secretaría de Educación de Veracruz.
- Ramirez, A., & Aguilar, J. L (2021). Producción casera y espontánea de videos en tiempo real: El caso de la Educación Superior. *NOiMAGEN* 4(3).
- Sartori, G. (1998). *Homo Videns. La sociedad teledirigida*. Taurus.
- Scribner, S. & Cole, M. (1981) *The Psychology of Literacy*. Harvard University Press.
- Swamy, N., Kuljaca, O., & Lewis, F.L. (2002). Internet-Based Educational Control Systems Lab Using NetMeeting. *IEEE Transactions on Education*. 45 (2), 145–151. <https://doi.org/10.1109/TE.2002.1013879>
- Yan, M. (2015). Constructing and reading visual information: Visual Literacy for Library and information science education. *Journal of Visual Literacy*, 34(2), 1–22. <https://doi.org/10.1080/23796529.2015.11674727>
- Yeh, H. H., Yang, C. Y., Lee, M. S., & Chen, C. S. (2013). Video aesthetic quality assessment by temporal integration of photo-and motion-based features. *IEEE Transactions on Multimedia*, 15(8), 1944-1957. <https://doi.org/10.1109/TMM.2013.2280250>

Acknowledgements

This paper draws on research undertaken as part of the Doctoral Programme in Innovation in Higher Education Institutions in the Centre for Research and Innovation in Higher Education at Universidad Veracruzana, Mexico.



About the author

Alberto Ramirez Martinell is a Full Time Researcher at Universidad Veracruzana, Mexico. He holds a PhD in Educational Research from Lancaster University, UK; a MSc in Computer Science and Media from the University of Applied Sciences in Furtwangen, Germany; a BSc in computer engineering from the National Autonomous University of Mexico (UNAM); and a BA in Humanities from the Universidad del Claustro de Sor Juana, Mexico. His research interests revolve around the incorporation of Information and Communication Technologies (ICT) in Higher Education, the digital knowledge set, visual literacy, digital culture and virtual education. He is currently the national coordinator of the ICT and education area in the Mexican Educational Research Association (COMIE). Alberto is an Alumni Member of the Centre for Technology Enhanced Learning at Lancaster University. His twitter handle is @armartinell and his personal website at the university can be accessed in <https://www.uv.mx/personal/albramirez/inicio/english/>

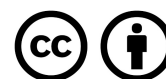
✉ Email: albramirez@uv.mx

ORCID: [0000-0003-2370-4994](https://orcid.org/0000-0003-2370-4994)

🐦 Twitter: [@armartinell](https://twitter.com/armartinell)

Open Access (CC BY 4.0)

© 2020 The Authors. This article is distributed under Creative Commons Attribution 4.0 International licence.



You are free to

- Share — copy and redistribute the material in any medium or format
- Adapt — remix, transform, and build upon the material for any purpose, even commercially.

Under the following terms:

- Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.
- No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.

The full licence conditions are available at: <https://creativecommons.org/licenses/by/4.0/>

