Does Camera Use Matter? An Experiment on the Effect of Camera-use on Perceptions of Psychology Students and Lecturers

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Received: 18 March 2025
Received in revised form: 13 June 2025
Accepted: 20 June 2025
Published: 7 July 2025

ABSTRACT

The COVID-19 pandemic required most of the human population to drastically change their everyday lives to adapt to social distancing. One such change was the rapid migration to online courses which required both students and teachers to quickly adapt to new ways of teaching and learning. Here, we focus specifically on the impact of using online cameras on teaching and learning experiences of university students and lecturers. Through two pre-registered mixed methods studies we observed the impact of using online cameras during an online lecture on students' (n = 105) and lecturers' (n = 19) dehumanization, motivation and perceived learning. While quantitative data suggests no significant effect of camera use, qualitative analysis suggests a great impact of camera use, and, more generally of online teaching compared to in-person settings for both lecturers and students. Overall results suggest a nuanced view in which both positive and negative aspects of online teaching are recognized.

Key words:
Online learning; In-person learning; Students; Lecturers; COVID-19

Introduction

Since the fourth industrial revolution, technology has become a crucial aspect in education. Schools have adapted their curricula to develop technological competencies, and lecturers have adapted their practice to incorporate technology in the classroom. However, in recent years, perhaps the most radical and rapid change introduced in education was caused by the quarantines associated with the Covid-19, where all actors in the education system were forced to modify their practices and carry out their lectures remotely and mediated by technology. Across the globe, schools and universities began to offer synchronous lectures through video conference systems such as Zoom, that allowed students to attend classes without leaving their homes.

Even before the Covid-19 pandemic, the impact of online, remote and virtual instruction had already been a subject of much scholarly inquiry (Steele et al., 2017; Crisol-Moya et al., 2020; Martin et al., 2018). However, to our knowledge, fewer studies have explored the impact of the sudden shift to online instruction during Covid-19 in educational communities who did not expect it and were ill-prepared for it. Of interest here is the effect of a specific feature of online learning, camera use, on several phenomena related to learning: the tendency to dehumanize the other person, perceived learning and motivation for learning.

Dehumanization and infrahumanisation are taken as the implicit belief that another person is somehow less than human. This belief involves perceiving that the other person lacks central qualities to the human experience and deserves to be subject of contempt and mistreatment (Haslam & Loughnan, 2014). Recent theories on dehumanization have proposed a dual model of dehumanization that distinguishes between two forms of dehumanization: mechanistic and animalistic. The mechanistic type of dehumanization consists in perceiving the dehumanized target as an inanimate object or robot who lacks the ability to feel pain and emotions such as enjoyment, regret, guilt, or sympathy for others. The animalistic type of dehumanization consists in perceiving

e-ISSN 2600-8572 | DOI: https://doi.org/10.11113/itlj.v9.174

the target as an animal who lacks unique human qualities such as intelligence, self-control, and the ability to reflect and justify their actions and their consequences (Haslam & Loughnan, 2014, p. 402-3). In the present study, we aimed to establish whether using web cameras during online lectures was associated with the tendency of lecturers and students to dehumanize or infrahumanise each other during class.

Undergraduate learning involves the acquisition of a large number of complex and abstract contents, often with a great delay between receiving the content (i.e. lectures) and receiving feedback. In consequence, students have to self-monitor their learning and adapt their strategies accordingly. This process of monitoring depends on students' perceived learning, that is, the extent to which they believe that they have acquired new knowledge or understanding, and the extent to which they feel difficulty or enjoyment while studying the subject matter (Caspi & Blau, 2008). Recent research suggests that perceived learning is particularly important in online learning situations, as it impacts motivation and student's engagement (Ferrer et al., 2022).

Classically, motivation is divided into two independent constructs: extrinsic and intrinsic motivation. Whereas extrinsic motivation is contingent on the presence of external rewards or punishments, intrinsic motivation follows motives or values that are internal to the individual and are usually stable across time and context (Ferrer et al., 2022). Typically, extrinsic motivation does not lend itself to continued behaviour, since it requires consistent rewards or punishments, lacking which, behaviour quickly returns to baseline. On the contrary, intrinsic motivation does not require permanent contingencies for consistent behaviour change, as this motivation rather follows objectives that are compatible with long-held values that the subject seeks in various contexts. In the present study, we aimed at determining whether student and lecturers' self-reported intrinsic and extrinsic motivation and perceived learning varied according to camera use.

Several studies have proposed that technology may be related to an increase in student motivation, partly because it allows for more applied spaces or examples with more tangible experiences (Al-Ansi, et al., 2023). However, most of this research has been done with applications designed as virtual reality applications and games. This is not necessarily the case for technology-mediated learning and teaching activities. In these contexts, there are no applications or tasks designed specifically for interaction with technology.

The integration of webcams in synchronous virtual classrooms has been supported by various educational theories that emphasize the importance of interaction and social connection in online learning environments (Belda-Medina & Calvo-Ferrer; 2022; Dennen et al., 2022; Navarro-Castillo & Antonio-Vargas, 2025). The Theory of Transactional Distance, originally proposed by Moore (1993), highlights the psychological and communicative gap that arises from the physical separation between students and instructors, which can lead to feelings of isolation and misunderstanding (Belda-Medina & Calvo-Ferrer, 2022). Turning webcams on has been proposed as a strategy to reduce this gap by promoting dialogue and interaction between lecturers and students (Navarro-Castillo & Antonio-Vargas, 2025). Likewise, the Community of Inquiry Framework underscores the role of social presence, as the ability of participants to project themselves socially and emotionally in online environments, as a key factor in achieving effective learning. Webcams contribute to presence by facilitating a sense of belonging and group cohesion, enhancing interaction, and providing non-verbal cues such as facial expressions that support pedagogical adjustment (Dennen et al., 2022).

However, challenges remain, as webcam use can also generate discomfort related to concerns about privacy, users' fatigue, or perceived surveillance (Dennen et al., 2022; Navarro-Castillo & Antonio-Vargas, 2025). The observer effect suggests that awareness of being watched can modify behaviour, which has implications for how webcam use is perceived, either as a facilitator of engagement or a source of pressure (Dennen et al., 2022). Consequently, the effectiveness of webcams in online education depends not only on their potential to enhance presence and interaction but also on how learners navigate the tensions between connection, control, and personal comfort.

Here, we explored psychology lecturers' and students' experiences during online remote teaching and learning; with a particular focus on the effects that turning the webcam on or off has on the participants' dehumanization, perception of learning, and motivation for learning. For this, we carried out two mixed-methods studies: participants in Study 1 were undergraduate psychology students, and participants in Study 2 were psychology lecturers. In both studies, participants engaged in a simulated online teaching environment (a pre-recorded Zoom meeting). In the first study, students attended a lecture; in the second, lecturers delivered one. Immediately following the simulation, participants completed questionnaires assessing their emotional, motivational, and learning experiences during the online lecture. They were then interviewed about their impressions during this activity, and about their online learning and teaching experiences in general.

e-ISSN 2600-8572 | DOI: https://doi.org/10.11113/itlj.v9.174

The main aim of the present study was to explore the effects of camera-use in both students and lecturer's motivation, dehumanizing beliefs and perceived learning during online learning situations. Our results can contribute to better leveraging online teaching's advantages and offset its possible limitations to foster inclusive and high-quality education.

Methods

Design

A mixed-methods design was used (Hernandez, Fernandez & Baptista, 2014), including quantitative data from two experimental studies (study 1: for students, study 2: for lecturers) and qualitative data from interviews with both groups. This mixed approach allowed for a broader understanding of the experience and perceptions of the participants (Ponce & Pagán-Maldonado, 2015). Whilst the questionnaire provided specific data about the main variables, the interviews delved into the participants' further perceptions from real experiences and the experiment. Study 1, where participants were students, had a between-subjects design, with camera condition (lecturer's camera on or off) as independent variable, and dehumanization, perception of learning and motivation as dependent measures. Study 2, where participants were lecturers, had a within-subjects design, with camera condition (2 levels: students' camera on or off) as independent variable; and the same dependent variables, namely dehumanizing beliefs, motivation for learning and perception of learning. In study 1 out of 105 students, we randomly chose 37 for in-depth interviews. In study 2 we recruited a total of 21 lecturers, all of which answered the in-depth interviews and 19 also completed the quantitative survey.

Table 1. Summary of experimental conditions and methods

Aspect	Study 1: Students	Study 2: Lecturers
Participants	105 undergraduate psychology students (Age: 18–26, M = 19.59, SD = 1.86; 83 women)	21 psychology lecturers (Age: 26–50, M = 38.36, SD = 6.07; 14 women)
Experimental condition	Lecturer's camera on vs. off	Students' cameras on vs. off
Experimental setup	Students watched a 7-minute online lecture with 1 lecturer and 5 students	Lecturers gave a 7-minute lecture to 6 students (3 with webcam, 3 without)
Real-time or simulated	Pre-recorded video; simulated interaction	Pre-recorded video; simulated interaction
Independent variable	Lecturer's camera condition	Students' camera condition
Dependent variables	Dehumanization, learning motivation, perception of learning	Dehumanization, motivation to teach, perception of students' learning
Scales used	- Dehumanization: 8 items, 7-point Likert scale - Motivation & perception: 5-point Likert scales	Identical scales, adapted wording for lecturers
Quantitative data /Qualitative interviews	105 students completed the quantitative survey/ 37interviewed	19 lecturers completed the quantitative survey, 21 interviewed
Time per participant	Survey+sesion: ~10 minutes Interview: ~15 minutes	Survey + session: ~20 minutes Interview: ~15 minutes

Participants

Participants in study 1 were psychology undergraduate students from three private universities in Colombia. A total of 105 participants completed study 1 (age range = 18-26, Mage = 19.59, SD = 1.86, 83 women). Sample size was determined using an a priori power analysis (power = 0.8; alpha = 0.05; expected effect size: Cohen's d = 0.25). Participants in the second study were psychology lecturers recruited from universities in Colombia by e-mail and author's personal contact as well as through their respective universities. A total of 21 participants

e-ISSN 2600-8572 | DOI: https://doi.org/10.11113/itlj.v9.174

completed study 2 (age range = 26-50, Mage = 38.36, SD = 6.07, 14 women). Compromise power analysis suggests that n = 21 allows us to observe Cohen's d > 0.7 with expected power = 0.8 and alpha = 0.05).
For the qualitative phase, a sample of students who participated in study 1 (n = 20) and almost all the lecturers from study 2 (n = 19) were interviewed. Complete procedure, information sheets, questionnaires, etc. in both studies were in Colombian Spanish.

Instrumentation

Dehumanization:

Participants' tendency to dehumanize the person they interacted with during the online lecture situation (either the lecturer in study 1, or the students in study 2) were measured with an eight-item questionnaire, adapted from Batson et al. (2018) by using a back-translation procedure. The questionnaire used a 7-point Likert scale from 1 (Not at all) to 7 (Very much), to measure two types of dehumanization: mechanistic dehumanization (e.g., "the (lecturer/student) appeared mechanical and cold, like a robot"); and animalistic dehumanization (e.g. "the (lecturer/student) appeared to lack self-control, like an animal").

Motivation for learning

In study 1, students were asked to report their intrinsic and extrinsic motives to continue learning about the lecture's topic with a four-item questionnaire that used a 5-point Likert scale from 1(Strongly disagree) to 5 (Strongly agree) (e.g. "I would like to have a virtual lecture with this person again because they can offer me valuable knowledge for my professional experience"). In study 2, lecturers were asked about their intrinsic and extrinsic motives to continue teaching remote lectures to the students (e.g., "I would continue to teach this person only if it was a requirement of my contract").

Perception of learning.

In study 1, students reported the extent to which they perceived they had learned the contents of the lecture, with a three-item questionnaire that used a 5-point Likert scale from 1(Strongly disagree) to 5 (Strongly agree) (e.g., "I can identify the areas of psychology presented during the lecture"). In study 2, lecturers reported the extent to which they perceived the students in the lecture had learned the contents, with equivalent items (e.g., "(The target student) can explain the roles of psychologists in the areas of psychology presented during the lecture").

Demographic information

In both studies, participants were asked to report their age, gender, university affiliation, and for lecturers, years of teaching experience.

Procedure

Both studies were carried out online. Participants were asked to join an online meeting using their own computers, and to turn their webcams on during the whole procedure. In study 1, students were invited to attend a 7-minute presentation by a psychology lecturer about application fields of psychology. In study 2, lecturers were asked to deliver a 7-minute lecture on the same topic to a class of 6 students. Lecturers were given 5 minutes to prepare their talk before joining the online meeting.

In study 1, participants joined an online meeting where they could see a lecturer and 5 other students. In the video-on condition, lecturer delivered the talk with the camera on; in the video-off condition, the lecturer delivered the talk with the camera off. Similarly, in study 2, when participants joined the meeting, they found a class made of a group of 6 students: three of them (both genders) had active video (video condition) so participants could see their faces; and three of them (both genders) had no video (no-video condition), were only identified by their names in a black square. Unknowingly to participants, the online meeting was prerecorded, meaning that none of the people were interacting in real time with the participant in either study, although their behaviour made it seem like they were. In study 1, the lecturer made questions that were "answered" in writing by one of the students in the class, who was actually a research assistant; and in study 2 the students who had the video on nodded and took notes from time to time.

e-ISSN 2600-8572 | DOI: https://doi.org/10.11113/itlj.v9.174

After the online meeting, participants in both studies were asked to fill in a questionnaire that measured dehumanizing beliefs, motivation for learning and perception of learning, and their demographic information1. Subsequently, a sample of participants from both studies were interviewed by research assistants, who used a semi-structured questionnaire to explore their experience during the online teaching/learning situation, and about their experiences of this type in the past.

All in all, experiments lasted approximately 10 minutes per student in Study 1 and approximately 20 minutes per lecturer in study 2. Interviews in both studies lasted about 15 minutes.

Data Analysis

First, we ran a quantitative analysis comparing academic motivation, learning perception and dehumanization across camera and non-camera conditions using both frequentist and Bayesian independent samples T-tests.
Initially, we transcribed both students and lecturers' interviews. We ran a qualitative thematic exploratory analysis, an interpretive method that organizes the information into categories (Braun & Clarke, 2021). We used NVivo 14 for the coding process to identify recurrent themes and ideas relevant to our objectives. To identify each group 's specific experiences and unique experience through the experimental procedure, student and lecturers' interviews were analysed and categorized separately. We then performed a co-occurrence analysis that allowed us to either discard redundant codes or to unify related ones. Finally, we explored potential relationships between codes, and wrote the results.

Results

Study 1: Students

Quantitative data

As per our pre-registration (https://aspredicted.org/blind.php?x=1LB_L63) we checked for observed internal consistency of all dehumanizing beliefs, motivation for learning, and learning perception measures. We observed relatively low consistency scores (all Alphas and rs < 0.8) implying that measures were not internally consistent. Therefore, we analysed all items separately. Results indicated non-significant effects of video condition on all dehumanizing beliefs, motivation for learning and perception of learning variables (all ps > 0.05) and anecdotal evidence in favor of the null hypothesis (all BF 01 < 3).

Qualitative data

First, we describe codes related to the students' experience during the simulated online lecture, and then, their experience with online lectures in general.

Lecturers' experience during the simulated online lecture

Perceived closeness, affect and lecturer's appropriateness.
A few students did not give a clear answer in this category, arguing that the experience was too brief to form a clear impression about the lecturer. Unlike them, most students perceived the lecturer as warm, affectionate, competent, clear, and concise; and deemed her behaviour as appropriate for the situation. Curiously, more than half of the participants who reported this were in the camera-off condition. In contrast, nearly two thirds of participants perceived the lecturer as distant and cold during the online interaction. For these students, she appeared to be more focused on conveying knowledge than on getting to know them. They did not perceive her as affectionate, and did not feel individually addressed by her. Additionally, these students mentioned difficulties in communication with the lecturer, either because of connection issues or because of her monotonous tone. As one student points out "she is like a robot who repeats an already established theory".

Expectations about the lecturer in in-person teaching situations
While only 3 (out of 19) students did not perceive any difference between online or in-person lectures, most of them emphasized the advantages of in-person teaching. Most students suggested that in-person teaching would have a positive impact on the quality of the interaction with the lecturer, her pedagogy, and the ease with which questions could be addressed. Students in the camera-on condition offered more detailed descriptions about the

[1] See questionnaire, raw data, data analysis script and pre-registration
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e-ISSN 2600-8572 | DOI: https://doi.org/10.11113/itlj.v9.174

value of in-person teaching, such as the lecturers' motivation and pedagogical practices. Meanwhile, in the camera-off condition, students suggested online lectures necessarily imply technical limitations and connectivity issues, as one student mentions: "I think it would be important seeing how she expresses herself in her postures, and I also think that in-person she could interact with the audience a bit more, here she had no real chance to ask something to the audience".

Lecturer's motivation

Most students in the camera-off condition thought the lecturer wanted to offer them general information. They mentioned that she intended to provide them with a general overview of psychology's fields of study without giving too much detail. In contrast, students in the camera-on condition commented that the lecture was brief and informative, even though it did not allow for audience participation. Additionally, these students emphasized the lecturer's motivation was to talk about the theoretical bases of psychology. In the words of one participant: "she wanted to show us different fields of psychology, for us to understand a little bit about different fields and the role psychologists play in them".

A third of students considered that the lecturer's motivation was to inspire and to teach them about her own experience and knowledge on the topic. They also reported that her motivation went beyond merely providing an explanation, and that she appeared to be enjoying herself during the lecture. As this student points out: "I think her motivation is that she likes her job and the way she teaches because I really thought it was very well explained and I did not know about all those fields". A second third of students mentioned that the lecturer's motivation was related to her job even though she did not seem particularly keen on giving the lecture (see figure 1). Particularly, students in the camera-on condition emphasized the lecture as part of the lecturer's job and that she was simply following a script. Consequently, they assumed she was not intrinsically motivated to teach her lecture. As this student points out "as far as motivation goes, I guess simply to fulfil her role as a lecturer". Participants in the off condition tended to perceive the lecturer as lacking motivation for online lectures in general.

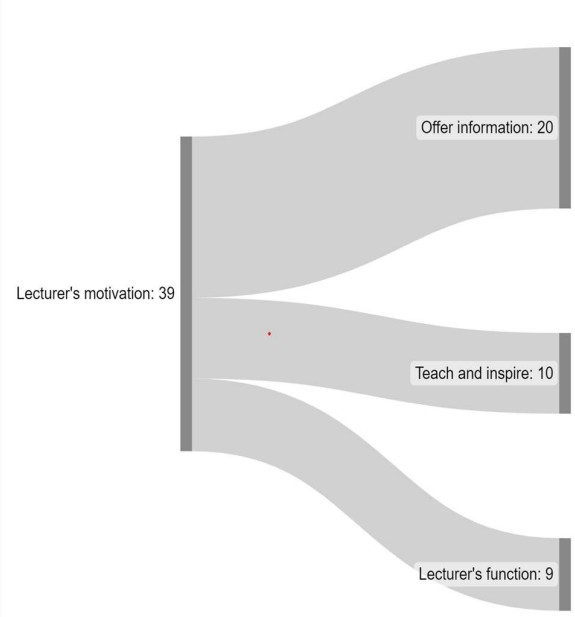

Figure 1. Coding density of perceived lecturer's motivation

Students' experience with online lectures in general

Flexibility

Students thought that online lectures allowed for greater flexibility and comfort, since they could save time, stress, and costs by not commuting every day. Similarly, they mentioned that sometimes online lectures afford flexibility by enabling them to attend lectures asynchronously. As this participant puts it: "we waste less time in transportation, for instance. It takes two hours for me to get home from the university". Additionally, several students in the camera-on condition emphasized that online lectures afford comfort and autonomy to choose where to study.

e-ISSN 2600-8572 | DOI: https://doi.org/10.11113/itlj.v9.174

Interaction through technology

Several students mentioned some virtues of technological tools used in online teaching situations, like the possibility of reviewing lectures asynchronously, the possibility of interacting with their peers using chatrooms, and being able to do group projects without having to meet in person with their classmates. Specifically, participants in the camera-off condition suggested that these advantages mentioned are more frequent if they themselves turn their camera on.

Strengthening social bonds

Even though it was relatively uncommon, students in the camera-off condition mentioned as a positive aspect that they got to spend time with their families, and they had a chance to broaden their social circles through online platforms. They also mentioned that some lecturers tried to be close to them and were mindful of their progress and wellbeing. As an example of this, this student commented:

> "I spent less time with my family before the pandemic because I ran from work to studying. During the pandemic, I spent more time with my family, I did not self-isolate so much, and my social circle became larger instead of smaller."

Lack of interaction, facial feedback, and participation

In general, students reported that they feel distant and disconnected from their classmates and lecturers during online lectures because they had to interact with them through screens, which makes it difficult for them to actively participate in class, raise questions or receive feedback. According to them, this feeling of disconnection was down to lacking social contact and face-to-face interaction and difficulties perceiving other people's emotions. As an example of this, a student commented: "We do not get the same level of attention from the lecturers [during online teaching]. I feel like they do not stop to look at our situation, our expressions, or to check whether we are getting what they say or not".

Less attention and focus

Students mentioned difficulties in keeping their focus on their online lectures due to the presence of distractions at home. They believe that in-person lectures provide more visual and pedagogical information that catch their attention, but in any case, they admit that in order to avoid being distracted they also have to exert self-control and be motivated for learning. Students in the camera-off condition tended to emphasize lecturers' difficulties in establishing whether students are paying attention to them, and the negative effect of the lack of social interaction on learning. About this, one student mentioned "As a student, I think we don't pay attention, because every interaction or lack thereof, lowers the quality of online lectures compared to in-person ones". Several participants in this condition also mentioned that listening to the lecturers' monotonous tone affects their interest and attention, but no participants in the camera-on condition mentioned this.

Poor internet connection, and online and in-person resources

Several students mentioned technological difficulties such as faulty internet connections among negative aspects of online lectures. In the words of a participant: "One can have access to a computer or to a cell phone, but the internet is not under our control. If it rains or power goes out, the internet turns off. So maybe that's also an obstacle". Additionally, some participants also commented that while some topics can be more easily adapted to online learning than others, in general, in-person lectures are better because of the use of physical resources such as blackboards (see figure 2).

e-ISSN 2600-8572 | DOI: https://doi.org/10.11113/itlj.v9.174

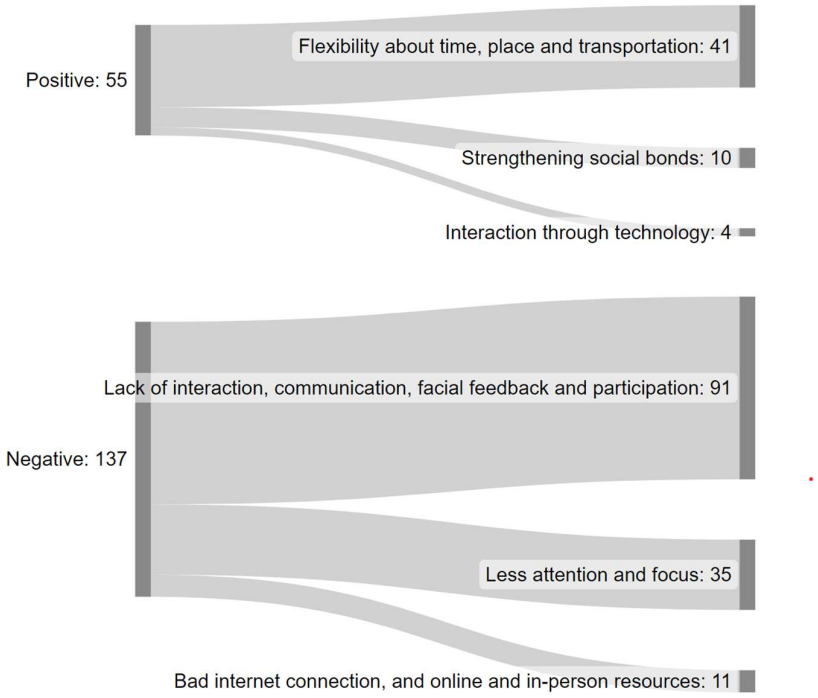

Figure 2. Coding density of positive and negative aspects in online lectures.

Impact on learning

In-person preference
Most participants prefer in-person lectures because they offer opportunities for direct interaction with lecturers and classmates, and the possibility of asking questions. For them, in-person lectures facilitate diverse pedagogical tools and resources to make learning easier. As this participant points out: "lecturers during in-person lectures, their attitude…changes a lot, let's say they connect more with us, start to ask more questions and so I feel there is more of an interaction and stuff sticks with you a bit more".

Online preferred
Very few students preferred online lectures or perceived that quality of learning was unaffected by online lectures.

Depends on the student
Some students considered that learning quality in online lectures was a function of each individual student, specifically their disposition, focus and commitment as well as their ability to adapt to this format. As one student says:

> "It depends on each student, some are more susceptible to being distracted by their environment, so I think it's a bit unavoidable for them to get distracted during class, unlike those who have it easier to focus their attention on what the lecturer is saying."

Depends on the lecturer or course
Few students considered that the quality of learning in online lectures hinged more on each individual lecturer's disposition and skill to convey their ideas clearly (see figure 3). Similarly, they considered this could change with each module. As this student mentioned:

> "It depends both on the lecturer's disposition and on the subject they are teaching. During online lectures I had an excel course and it was way better to attend online because I could look at my excel and follow along."

e-ISSN 2600-8572 | DOI: https://doi.org/10.11113/itlj.v9.174

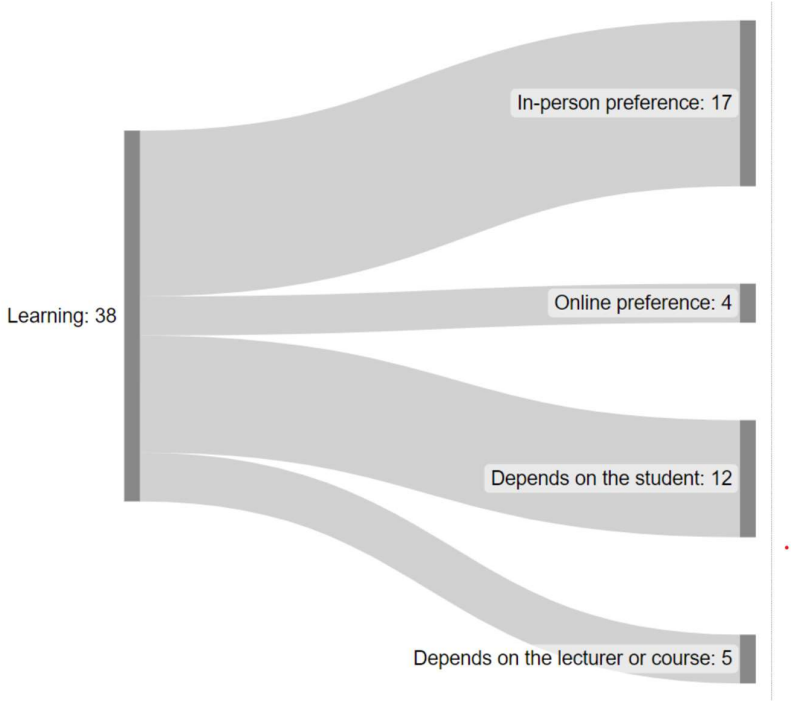

Figure 3. Coding density of learning in online lectures

Other aspects

Putting themselves in the lecturer's shoes

In several answers, it became evident that some participants tried to view situations from their lecturer's point of view, somehow putting themselves in the lecturer's place. These students mentioned lecturers may feel frustrated by the lack of interaction and visual feedback of the situation, and by the students' low participation during online lectures. For them, this was made worse when the students had their camera-off. They also pointed out that it must have been difficult for lecturers to suddenly adapt to teaching online using novel technological tools. As this participant points out:

> "They must feel the same as us, because they are people too. If I was a lecturer and I saw 30 students with their screens turned off and no one answered [my questions], no one said anything, that must be frustrating".

Study 2: Lecturers

Quantitative Data

In contrast to study 1, in study 2 the video condition was manipulated as a within-subject variable: each participant answered questions about students both with and without video. Following pre-registration (https://aspredicted.org/blind.php?x=T6G_GMS), we first evaluated internal consistency. Measures showed acceptable reliability (all Alphas and rs > 0.8) and were therefore analysed as an averaged measure. As for study 1, video condition showed non-significant effects (all ps > 0.05) with anecdotal evidence in favor of the null hypothesis (all BF01 < 3) (see online supplementary materials).

Qualitative data

As above, we first describe the results pertaining to the participants' experience during the simulated online lecture, and then, their experience with online teaching in general.

e-ISSN 2600-8572 | DOI: https://doi.org/10.11113/itlj.v9.174

Students' experience during the simulated online lecture

Perceived Closeness, affect and appropriateness of students
Most lecturers perceived closeness to students was affected by whether their camera was on or off. Specifically, they perceived that students with the camera on were more empathic, while students with their camera off were perceived as unresponsive. Relatively few lecturers claimed to be incapable of assessing the students' closeness, affect or appropriateness, since having the camera off was taken as evidence of lack of interest or competence. Others found it difficult to make judgments because of the limited time they had to interact with students and the fact that they did not know them beforehand. As this lecturer points out:

> "What you can really tell is having or not having your camera on, for the student who had the clearer cam compared to the lower quality camera and the image being really blurry makes a big difference, it makes it feel closer to having a clear image compared to simply their name or a colored logo."

Differences between students.
Almost all lecturers claimed that they perceived a difference between students, according to whether they turned their camera on or not. They mentioned that having the camera turned on allows interacting and connecting with students through non-verbal communication, recognizing movement or gestures, knowing whether students were taking notes, paying attention, whether they were confused or not. In the words of one lecturer: "I feel that the ones I saw on camera were showing interest, there is this non-verbal communication that reflects interest on the topic, or they nodded or took notes". Only two lecturers failed to mention these differences, because they found it difficult to tell students apart. Similarly, two other lecturers mentioned a lack of sufficient information to identify possible differences between students.

Differences to in-person teaching
The lecturer's expectations about students' attitudes and behaviors differ between online and in-person teaching. All lecturers mentioned that they would expect to see different behaviors and attitudes in the students if they were in an in-person setting, such as more commitment and attention to the lecture. Most of them attributed these differences to the opportunities for interacting and communicating that in-person teaching affords. In the words of a lecturer: "In in-person lectures are quite different, even if the students are thinking about something else, the mere fact of being physically there forces them to connect at least a little bit [with the lecture]".

Student's motivation
Most lecturers believed that students attended the online lecture because they were interested in learning about the fields of psychology or in receiving some sort of vocational counselling about a career in psychology. Only a few lecturers thought that the main motivation for the students' attendance was to receive some extra credits or to help the researchers with their project.

Students' experience with online lectures in general

Perceptions of learning in an online setting

Depends on the lecturer.
Most lecturers thought that online learning depends on the pedagogy used as well as the subject matter of the module. They also considered that adaptation to new teaching tools such as audiovisual materials or interactive platforms is crucial for successful learning. Moreover, they suggested that lectures that require practical components are the biggest challenge for online learning (see figure 4).

Depends on the student.
A great proportion of lecturers believed that success or failure of online learning hinges on students' discipline, motivation, and self-regulation to pay attention to class and do their homework as best they can. Similarly, they believed it is important that students have a physical space adapted to virtual learning. As this lecturer pointed out: "An important difference between online and in-person lectures, contrary to what students think, is that they must put more on their part because it is really easy being in a computer … I think that for an online class students have to be much more responsible of their own learning".

Depends on the educational level
Some lecturers agreed that online learning also depends on the students' educational level, believing that grad students are more committed, responsible, and productive than undergrads or highschoolers.

e-ISSN 2600-8572 | DOI: https://doi.org/10.11113/itlj.v9.174

In-person or online preferred

One lecturer commented that learning is better in online environments because they allow for innovation and collaborative work using emergent pedagogies (see figure 4). On the contrary, three lecturers mentioned they prefer in-person learning because it allows them to supervise each student, to eliminate distractions, and because they felt that sudden change to online learning was a burden for them.

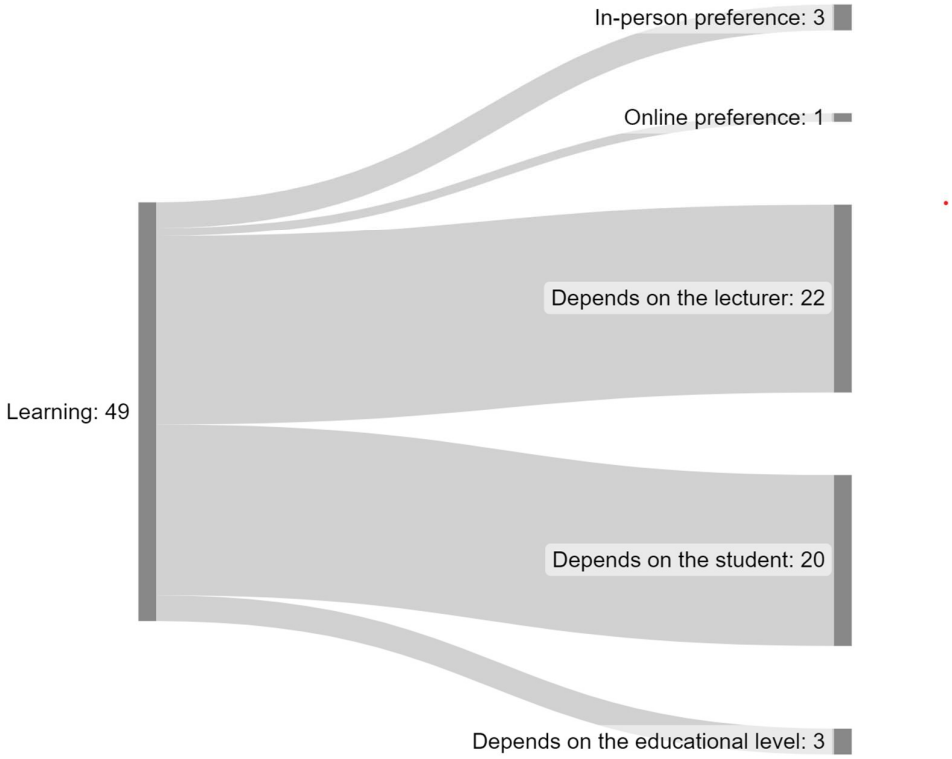

Figure 4. Coding density of learning in online lectures

Positive aspects of online teaching in psychology

Implementing technological tools. Most lecturers mentioned that most technological tools implemented in response to the Covid pandemic were adequate and allowed for more dynamic and creative lectures. For instance, they mentioned that they often ran online surveys among students, games, online blackboards, and tests on platforms such as Kahoot. This was perceived as an opportunity to modernize lectures and to engage students and limit the negative effect of other contextual factors on their education. Similarly, they believed this made higher education more accessible to a great deal of students. An example of this is this lecturer's opinion; “for online education there are some collaborative work options, student-centred, with emergent pedagogies and innovations that are more limited in-person” (see figure 5).

Time, place and transport flexibility, and comfort

Most lecturers commented that online lectures allowed both students and lecturers to attend lectures from anywhere, avoiding commuting and saving time and costs for everyone. Lecturers recognized that online teaching shatters spatial and temporal barriers making it easier to attend lectures and fostering well being. Some of them also mentioned that the possibility of recording and attending lectures later also fosters wellbeing. As this lecturer pointed out: “It is more comfortable for transportation, getting to the university is difficult whereas when students are at home it’s easier to say 'ok, I’m on time for class, I’ll get online'. Also, financially there are a lot less expenditures online”.

Negative aspects of online teaching

Diminished interaction and facial feedback in online settings. The most frequently negative aspect mentioned by lecturers was how online teaching hinders interaction. As one lecturer said: “I feel the student-lecturer bond online is very different than the in-person one”. They thought the lack of interaction of online lectures prevented them

e-ISSN 2600-8572 | DOI: https://doi.org/10.11113/itlj.v9.174

from recognizing students and from establishing closer bonds with them. They also mentioned that online learning makes it difficult to communicate with students because of the lack of visual feedback, and the impossibility of observing their nonverbal behaviors. They also emphasized that online settings are associated with decreased student participation like questions and demands for clarification, which is detrimental to students' learning.

Lack of attention

The second most frequently mentioned negative aspect was students' lack of attention. According to the lecturers, in online learning settings, students often engage in off-topic activities, which are facilitated by the fact that they can attend the lecture from places that are comfortable but inappropriate for learning, such as their beds. For them, these conditions result in decreased participation and difficulties in remembering the lesson contents. In the words of one lecturer: "it is really easy being on a computer and checking social media, videos, news, doing anything else during class and thinking that they are in class even though they are not".

Class absences

Another negative aspect mentioned by most lecturers was class absence, evident in behaviours like having microphones or cameras off, which lecturers take as lack of interest. Additionally, for them, the possibility that students have of recording the lectures and watching them later, makes it easier for them to distance themselves from class.

Diminished control over the class.

Lecturers also mentioned that they found it more difficult to control interactions with students because they were not able to offer personal feedback and monitor their learning.

Home environment

Lecturers suggested lectures were negatively affected by factors stemming from the home environment which was now the students' main learning environment. They mentioned variables such as distractions from other members of their families or pets: "Many students attend lectures on their beds, so it obviously impacts the whole process. Some others have a closed space just for them, no one interrupts them, others have their cats or dogs going around". They also pointed that the interaction between familiar and educational factors could have caused adaptation issues and burnout or anxiety among students.

Inadequate technological tools

Lecturers highlighted both their own and their student's difficulties in adapting to the technological conditions required by online learning. Similarly, they mentioned lacking preparation to adapt traditional methods to new techniques and environments.

Difficulties working as a group.

Lecturers mentioned that online teaching made it more difficult to assign work groups due to the difficulties of interacting online, and the students' tendency to avoid active participation. Moreover, they lamented that this situation gave students fewer opportunities to develop group coordination abilities and to develop conflict resolution skills.

Perceptions on mental health among students

As a final negative aspect of online teaching, lecturers highlighted the emotional toll that teaching online lectures took on them. Several lectures likened the experience an online lecture where everyone has the camera off to talking to a "black brick wall", -the "black bricks" being the windows that show each student's name in online Zoom meetings.- Lecturers perceived that these experiences had negative effects both on their and the students' wellbeing, which were probably made worse by the impact possible of other family, social or emotional issues related with the pandemic. About this a lecturer mentioned: "that thing of spending two years in front of black bricks was really hard, some colleagues even got really depressed and disheartened about teaching".

e-ISSN 2600-8572 | DOI: https://doi.org/10.11113/itlj.v9.174

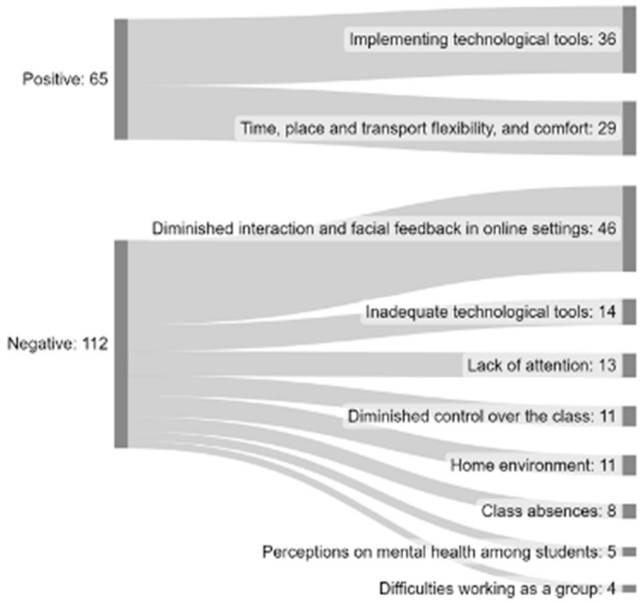

Figure 5. Coding density of positive and negative aspects in online lectures

Other Aspects

Empathy or putting themselves in student's shoes
Approximately a third of lecturers thought that the reason why the students did not turn the camera on was not their lack of interest, but the presence of difficulties at home that were beyond their control. As this lecturer said "there are a lot of students who do not turn their camera on, maybe it's where they are, maybe it's being confronted with the camera itself". In consequence, lecturers suggested adopting an empathic and understanding attitude, for example by making notes of their own pedagogical practices and methods to make lectures more dynamic and appealing to students and trying to make them lighter for them.

Discussion

The present study used a mixed-methods approach to explore the effects of (not) turning the camera on during online psychology lectures. We used an experimental approach in which a group of students (study 1) and lecturers (study 2) were invited to attend a simulation of an online lecture followed by a survey and in-depth interview about their experience during the lecture and other online teaching and learning experiences. While quantitative results were inconclusive, suggesting no observable effect of using or not using a camera, qualitative results convincingly suggest that both students and lecturers were impacted by camera use in various aspects of the online class experience. This discussion section attempts to reconcile these apparently disparate results.

First, in both our quantitative and qualitative data there was no evidence suggesting that engaging in online lectures led to perceiving the other as lacking human properties, dispositions, emotions, etc. While it may be tempting to explain these null results in our quantitative analyses as stemming from the relatively small size of our sample, these conclusions were ratified by our qualitative data, where we found no evidence that either lecturers or students tended to perceive each other as lacking human qualities. On the contrary, we observed an opposite tendency in many participants, who empathized with the other party's predicaments during online lectures. In other words, we cannot conclude from our data that online learning leads to dehumanizing or infrahumanising attitudes. That said, we did find that many participants (lecturers and students) perceived that online learning does not afford proper human interaction, because they felt that it lacked the possibility of seeing each other's gestures or if they are paying attention, etc. In this sense, our results suggest that online interaction, while not leading to infra- or dehumanization, does have negative impacts on the quality of social interaction.

Our findings echo previous results of research on online education which suggest that social inferences do not largely differ from in-person inferences provided sufficient social cues. For instance, participants reliably infer a person's competence and trustworthiness from online interaction based on information such as choice of

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background, gender and facial expressions (Cook et al., 2023). In this sense, while students and lecturers are aware of possible negative effects of online teaching in social perception in general (Ellis et al., 2020; Uusiautti et al., 2023), it appears that this concern is largely exaggerated since online or in-person setting does not appear to have a drastic effect on social cognition. That said, being able to infer another person's competence and trustworthiness in an online interaction does not compensate for the feelings of loneliness and isolation that are commonly associated with these contexts, and which we also observed in our participants' reports (Magis-Weinberg et al., 2021).

As for the educational impacts of online teaching, our data suggest that both lecturers and students found online learning difficult for their motivation and attention. Both groups considered that online learning demands a greater deal of effort and self-regulation from the students. Hence, most of our participants perceived that whilst online teaching and learning affords some flexibility and the use of novel tools, it also produces poorer learning outcomes. This perception of increased difficulty and poorer achievement in online teaching environments has also been found in previous research (Harris & Parish, 2006; Lee & Wong, 2023; Levenberg & Caspi, 2010; Zhang & Piper, 2023.

It is important to acknowledge some limitations of the present study. First, the sample size of lecturers was relatively small. While collected sample size of students affords a reasonable change to observed realistic effect size, lecturers' sample size allows a reasonable chance to observe a conventionally large effect size (Beta = 0.8 for Cohen's $d > 0.7$) making it unlikely for our study to actually observe smaller effect sizes. It is important to note that a small sample size can limit the generalizability of our findings. We explicitly welcome potential future studies to replicate these results prior to building up on them. Relatedly, it is difficult to say whether our findings would be the same in a larger and more diverse sample of lecturers.

Second, it is possible that the lecturers in our sample may have been more collaborative than the average lecturer. For example, the study by Beardsley, Albó, Aragón & Hernández-Leo (2021) found that lecturers who were more willing to participate in emergency remote teaching during the Covid-19 pandemic were also more likely to be collaborative and to use digital technologies in their teaching. This suggests that lecturers who volunteer to participate in research studies on new teaching methods and technologies may also be more collaborative than the average lecturer.

Third, the online lecture that our participants attended was a simulated scenario, not a real class. While this allowed us to standardize the data collection situation and to control potential confounding variables, this decision limits the ecological validity of our conclusions. In particular, the artificiality of the situation may have contributed to the difficulty that some lecturers and students had in making attributions about each other.

Finally, as researchers and lecturers in the psychology faculty, we were interested in whether our students, who are in a very humanized field of study, were having difficulty humanizing others. Therefore, our study only included participants from psychology departments. This limits the generalizability of our findings to other professions. However, we did not find a strong relationship between the ability to see students or lecturers and dehumanization, which was our initial hypothesis. Based on this, we expect that our findings would be similar in other faculties.

Despite these limitations, we submit that the findings of this study are valuable. They provide some preliminary evidence that students and lecturers may benefit from seeing each other on a webcam in remote learning environments. Future research should replicate these findings with larger sample sizes and more diverse populations.

Conclusions

This study investigated the impact of camera use during online psychology lectures. Quantitative results were inconclusive, but qualitative data revealed that camera use significantly influenced participants' perceptions of online lectures. While online learning did not lead to dehumanization, it negatively affected social interaction quality. Both lecturers and students found online learning challenging, associating it with increased self-effort, reduced motivation, and poorer outcomes.

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This research contributes to understanding the nuanced dynamics of online learning, emphasizing the importance of visual cues for humanizing the online educational experience and suggesting avenues for further research with diverse populations.

Conflict of Interest

The author(s) declare(s) that there is no conflict of interest regarding the publication of this paper.

Acknowledgments

This article was funded by the Asociación Colombiana de Facultades de Psicología (ASCOFAPSI) research grant for 2021. The authors thank ASCOFAPSI for their valuable support.

References

Al-Ansi, A. M., Jaboob, M., Garad, A., & Al-Ansi, A. (2023). Analyzing augmented reality (AR) and virtual reality (VR) recent development in education. *Social Sciences & Humanities Open, 8*(1), 100532. https://doi.org/10.1016/j.ssaho.2023.100532

Beardsley, M., Albó, L., Aragón, P., & Hernández-Leo, D. (2021). Emergency education effects on teacher abilities and motivation to use digital technologies. *British Journal of Educational Technology, 52*(4), 1455–1477. https://doi.org/10.1111/bjet.13101

Belda-Medina, J., & Calvo-Ferrer, J. R. (2022). Integrating augmented reality in language learning: Pre-service teachers' digital competence and attitudes through the TPACK framework. *Education and Information Technologies, 27*(9), 12123–12146. https://doi.org/10.1007/s10639-021-10678-2

Benito, Á., Yenisey, K., Khanna, K., Masis, M., Monge, R., & Tuğtan, M. (2021). Changes that should remain in higher education post COVID-19: A mixed-methods analysis of the experiences at three universities. *Higher Learning Research Communications, 11*(0), 51–71. https://doi.org/10.18870/hlrc.v11i0.1195

Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. SAGE Publications.

Caspi, A., & Blau, I. (2008). Social presence in online discussion groups: Testing three conceptions and their relations to perceived learning. *Social Psychology of Education, 11*, 323–346. https://doi.org/10.1007/s11218-008-9054-2

Cook, A., Thompson, M., & Ross, P. (2023). Virtual first impressions: Zoom backgrounds affect judgements of trust and competence. *PLOS ONE, 18*(9), e0291444. https://doi.org/10.1371/journal.pone.0291444

Crisol-Moya, E., Herrera-Nieves, L., & Montes-Soldado, R. (2020). Educación virtual para todos: Una revisión sistemática. *Education in the Knowledge Society (EKS), 21*(13). https://doi.org/10.14201/eks.23448

Dennen, V. P., Yalcin, Y., Hur, J., & Screws, B. (2022). Student webcam behaviors and beliefs: Emergent norms, student performance, and cultural differences. *Online Learning, 26*(4), 168–192. https://doi.org/10.24059/olj.v26i4.3487

Ellis, W. E., Dumas, T. M., & Forbes, L. M. (2020). Physically isolated but socially connected: Psychological adjustment and stress among adolescents during the initial COVID-19 crisis. *Canadian Journal of Behavioural Science, 52*(3), 177–187. https://doi.org/10.1037/cbs0000215

Ferrer, J., Ringer, A., Saville, K., Parris, M. A., & Kashi, K. (2022). Students' motivation and engagement in higher education: The importance of attitude to online learning. *Higher Education, 83*(2), 317–338. https://doi.org/10.1007/s10734-020-00657-5

Haslam, N., & Loughnan, S. (2014). Dehumanization and infrahumanization. *Annual Review of Psychology, 65*(1), 399–423. https://doi.org/10.1146/annurev-psych-010213-115045

Hernández Sampieri, R., Fernández Collado, C., & Baptista Lucio, M. del P. (2014). *Metodología de la investigación* (6th ed.). McGraw-Hill Interamericana Editores.

Lee, I. C. J., & Wong, P. (2023). A mixed methods, longitudinal study: Characterizing the differences in engagement and perceived learning of medical students in online and in-person team-based learning classes. *MedEdPublish, 13*(33), 33. https://doi.org/10.12688/mep.19265.2

Levenberg, A., & Caspi, A. (2010). Comparing perceived formal and informal learning in face-to-face versus online environments. *Interdisciplinary Journal of E-Learning and Learning Objects, 6*(1), 323–333. https://doi.org/10.28945/1321

Li, L., Zhang, R., & Piper, A. M. (2023). Predictors of student engagement and perceived learning in emergency online education amidst COVID-19: A community of inquiry perspective. *Computers in Human Behavior Reports, 12*, 100326. https://doi.org/10.1016/j.chbr.2023.100326

Magis-Weinberg, L., Gys, C. L., Berger, E., Domoff, S. E., & Dahl, R. E. (2021). Positive and negative online experiences and loneliness in Peruvian adolescents during the COVID-19 lockdown. *Journal of Research on Adolescence, 31*(3), 717–733. https://doi.org/10.1111/jora.12666

Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. *Computers & Education, 159*, 104009. https://doi.org/10.1016/j.compedu.2020.104009

Moore, M. G. (1993). Transactional distance theory. In D. Keegan (Ed.), *Theoretical principles of distance education* (pp. 22–38). Routledge.

Navarro-Castillo, Y. M., & Antonio-Vargas, J. R. (2025). Uso de cámaras web en evaluaciones sumativas en la educación superior: Contexto virtual. *Revista Iberoamericana de Educación, 97*(2), 83–98. https://doi.org/10.35362/rie9725733

Onyema, E., Eucheria, N., Obafemi, F., Sen, S., Atonye, F., Sharma, A., & Alsayed, A. (2020). Impact of coronavirus pandemic on education. *Journal of Education and Practice, 11*(13), 108–121. https://doi.org/10.7176/JEP/11-13-12

Ponce, O. A., & Pagán-Maldonado, N. (2015). Mixed methods research in education: Capturing the complexity of the profession. *International Journal of Educational Excellence, 1*(1), 111–135. https://doi.org/10.18562/IJEE.2015.0007

Steele, J. P., Robertson, S. N., & Mandernach, B. J. (2017). Fostering first-year students' perceptions of teacher presence in the online classroom via video lectures. *Journal of the First-Year Experience & Students in Transition, 29*(2), 79–92.

Uusiautti, S., Hyvärinen, S., & Björkman, S. (2021). The mystery of remote communality: University students' and teachers' perceptions during the COVID-19 pandemic. *Human Arenas*. https://doi.org/10.1007/s42087-021-00262-7

Yassine, F., Maaitah, T., Maaitah, D., & Al-Gasawneh, J. (2022). Impact of COVID-19 on the university education system in Jordan. *Journal of Southwest Jiaotong University, 57*(1), 649–663. https://doi.org/10.35741/issn.0258-2724.57.1.58