

# Live Versus Video-Recorded Student Presentations: A Convergent Mixed-Methods Study of Confidence, Anxiety, and Engagement in Higher Education

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## ABSTRACT

*This study used convergent mixed-methods to investigate whether live presentations and video-recorded presentations differentially affected undergraduate students' presentation confidence and anxiety and their level of engagement with presentations. A total of 35 students completed both a live and an edited video presentation; researchers used validated Likert scales to measure quantitative outcomes, which they analyzed through paired tests in JASP and thematic analysis of written reflections in NVivo. The video format produced increased task-specific confidence according to quantitative analysis, which showed a difference of 2.29, a large standardized effect size of 0.89, and a p-value below .001. The analysis revealed that no significant differences existed between the two presentation formats concerning presentation anxiety (paired  $t = 1.26$ ,  $p = .216$ ) or engagement (paired  $t = -1.36$ ,  $p = .183$ ); nonparametric analyses returned consistent results. The qualitative analysis of 35 reflections found six main themes, which included rehearsal and control, real-time interaction and feedback, technical workload, perceived fairness, affective effects, and logistics; the analysis showed that 26 participants linked rehearsal/control to increased confidence, while 24 participants showed the same link. The joint display connected the quantitative and qualitative data: the video condition provided confidence gains, which related to the students' reported chances for rehearsal and revision. At the same time, their anxiety and engagement levels changed based on their interactional and logistical circumstances. The research demonstrates how Self-Efficacy Theory applies to controlled mastery chances between recording and editing, leading to improved performance in specific tasks, while Social Presence Theory shows how people face choices between two options that affect their personal contact with others and the process of performance assessment. The practical implications require institutions to establish organized recording practice spaces, which create fairness in assessment through separate content assessment from production quality assessment. At the same time, they need to help students with technical problems to create equity in educational outcomes.*

**Keywords:** presentation format, video recording, self-efficacy, social presence, mixed methods, higher education.

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## INTRODUCTION

Students in engineering programs need to develop oral presentation skills because engineers need to deliver technical details to various audience members, who may include experts and non-experts, and people in management positions.<sup>1</sup> The increasing demand from employers and accreditation bodies for communication skills to match technical skills creates a requirement for educational institutions to develop presentation assessment methods, which requires special attention as an essential academic task.<sup>2</sup>

Instructors at present-day universities use both live (synchronous) oral presentations and video-recorded (asynchronous) presentation assignments as their primary teaching method. The two presentation methods create different learning environments because live presentations enable immediate audience reactions and instant feedback. At the same time, students who use video-recorded tasks can practice their materials at different times and choose which sections to edit and which parts to watch again, which results in different emotional responses and performance outcomes for learners.<sup>3</sup> The COVID-19 pandemic period, which saw an increase in both blended and digital educational methods, has resulted in more educational institutions using recorded materials to conduct both summative and formative assessments.<sup>4</sup>

The available research about how different methods of presenting information impact people's emotional states through their confidence levels and anxiety levels produces conflicting results.<sup>5</sup> The research studies, which include meta-analyses and systematic reviews, demonstrate that students in higher education experience small yet significant improvements in their learning outcomes when they use video-based educational materials.<sup>6</sup>

<sup>1</sup> Muhammad Younus et al., "Technical Oral Presentations (TOP) in EFL Engineering Education: A Systematic Literature Review on Workplace Communication Preparedness," *World Journal of English Language* 16, no. 2 (October 21, 2025): 229, <https://doi.org/10.5430/wjel.v16n2p229>.

<sup>2</sup> Rob J. Nadolski et al., "Rubric Formats for the Formative Assessment of Oral Presentation Skills Acquisition in Secondary Education," *Educational Technology Research and Development* 69, no. 5 (October 20, 2021): 2663–82, <https://doi.org/10.1007/s11423-021-10030-7>; Haerawan Haerawan, Woolnough Cale, and Uwe Barroso, "The Effectiveness of Interactive Videos in Increasing Student Engagement in Online Learning," *Journal of Computer Science Advancements* 2, no. 5 (October 14, 2024): 244–58, <https://doi.org/10.70177/jsca.v2i5.1322>.

<sup>3</sup> Natalie Hallemans and Charles Copeland, "Student Perceptions of Live Versus Recorded Presentations," *STEM Journal* 26, no. 2 (May 31, 2025): 28–42, <https://doi.org/10.16875/stem.2025.26.2.28>; Natalie Hallemans, "Using Student Created Video Presentations to Build Experiential Learning in the Oral EFL Presentation Classroom," *The Korean Association of General Education* 15, no. 5 (October 31, 2021): 229–45, <https://doi.org/10.46392/kjge.2021.15.5.229>.

<sup>4</sup> Marta Montenegro-Rueda et al., "Assessment in Higher Education during the COVID-19 Pandemic: A Systematic Review," *Sustainability* 13, no. 19 (September 22, 2021): 10509, <https://doi.org/10.3390/su131910509>; Moch. Rizal Fuadiy et al., "Mapping the Digital Transformation of Education in Indonesia from 2012 to Early 2025: A Bibliometric Analysis of Scopus-Indexed Publications," *Journal of Educational Research and Practice* 3, no. 2 (July 26, 2025): 276, <https://doi.org/10.70376/jerp.v3i2.390>.

<sup>5</sup> Abdullah Adnan Mohamed et al., "Anxiety Could Be a Good Sign: Understanding Challenges in Developing Engineering Graduates' Technical Oral Presentation Competencies," *International Journal of Language Education and Applied Linguistics* 13, no. 1 (June 30, 2023): 69–79, <https://doi.org/10.15282/ijleal.v13i1.7531>.

<sup>6</sup> Michael Noetel et al., "Video Improves Learning in Higher Education: A Systematic Review," *Review of Educational Research* 91, no. 2 (April 16, 2021): 204–36, <https://doi.org/10.3102/0034654321990713>; Mariana Morgado et al., "Video-Based Approaches in Health Education: A Systematic Review and Meta-Analysis," *Scientific Reports* 14, no. 1 (October 10, 2024): 23651, <https://doi.org/10.1038/s41598-024-73671-7>; Ting Sun et al., "Effects of Multimedia-Based Education on Learning Outcomes: An Evidence Gap Map Analysis and A Second Order Meta-Analysis," *Journal of Educational Multimedia and Hypermedia* 32, no. 1 (2025): 57–95, <https://doi.org/10.70725/798356qwfmej>; Zhujun Jiang, Yicong Zhang, and Feng-Kuang Chiang, "Meta-analysis of the Effect of 360-degree Videos on Students' Learning Outcomes and Non-cognitive Outcomes," *British Journal of Educational Technology* 55, no. 6 (November 17, 2024): 2423–56, <https://doi.org/10.1111/bjet.13464>.

Research from multiple academic fields shows that students who create their own videos experience higher self-reported confidence levels and better chances to evaluate their own learning progress.<sup>7</sup> Research studies that compare different presentation methods find that both in-person and pre-recorded presentations produce equivalent results in anxiety levels and performance outcomes because these factors depend on the specific context, which includes discipline assessment stakes, prior experience, and study design.<sup>8</sup>

The research study uses Self-Efficacy Theory and Social Presence Theory to explain the impact of presentation format on emotional results.<sup>9</sup> According to Self-Efficacy Theory,<sup>10</sup> People develop confidence in their abilities to perform a particular task after they complete mastery experiences, which include both practice and performance.<sup>11</sup> Students who complete video-recorded assignments obtain presentation self-efficacy benefits through the process of practicing multiple times and choosing specific segments to review. Social Presence Theory,<sup>12</sup> demonstrates how people experience social presence through their direct face-to-face communication.<sup>13</sup> Through their face-to-face communication, people experience social presence because they can exchange social presence through their direct contact with others. Live presentations create social evaluation stress, which affects both anxiety levels and people's ability to communicate.<sup>14</sup>

Researchers currently lack sufficient studies that use validated quantitative methods together with qualitative assessments to evaluate recorded and blended presentation tasks in engineering fields. Existing research studies use between-group designs and non-technical

<sup>7</sup> Noetel et al., "Video Improves Learning in Higher Education: A Systematic Review"; Alvina Atkinson et al., "Student-Created Videos in Online STEM Education: A Large, Interdisciplinary, Randomized Control Study," *Discover Education* 3, no. 1 (October 15, 2024): 178, <https://doi.org/10.1007/s44217-024-00283-8>; Sun et al., "Effects of Multimedia-Based Education on Learning Outcomes: An Evidence Gap Map Analysis and A Second Order Meta-Analysis."

<sup>8</sup> Siham Ouhir, "Online Peeragogy: Effects of Videos Developed by Students on Peer Learning and Their Impact on Academic Results," *International Journal of Emerging Trends in Engineering Research* 7, no. 11 (November 15, 2019): 576–83, <https://doi.org/10.30534/ijeter/2019/287112019>; Sven Trenholm and Fernando Marmolejo-Ramos, "When Video Improves Learning in Higher Education," *Education Sciences* 14, no. 3 (March 15, 2024): 311, <https://doi.org/10.3390/educsci14030311>.

<sup>9</sup> Hartono Hartono et al., "English Presentation Self-Efficacy Development of Indonesian ESP Students: The Effects of Individual versus Group Presentation Tasks," *International Journal of Language Education* 7, no. 3 (October 6, 2023), <https://doi.org/10.26858/ijole.v7i3.34442>; Damien Gabriel et al., "Watching Live Performances Enhances Subjective and Physiological Emotional Responses Compared to Viewing the Same Performance on Screen," *IBRO Neuroscience Reports* 19 (December 2025): 381–90, <https://doi.org/10.1016/j.ibneur.2025.08.002>.

<sup>10</sup> Albert Bandura, "Self-Efficacy: Toward a Unifying Theory of Behavioral Change," *Advances in Behaviour Research and Therapy* 1, no. 4 (January 1, 1978): 139–61, [https://doi.org/10.1016/0146-6402\(78\)90002-4](https://doi.org/10.1016/0146-6402(78)90002-4).

<sup>11</sup> Marco Schickel, Nina Minkley, and Tobias Ringeisen, "Performance during Presentations: A Question of Challenge and Threat Responses?," *Contemporary Educational Psychology* 73 (April 2023): 102168, <https://doi.org/10.1016/j.cedpsych.2023.102168>; Jason D. Saville and Lori L. Foster, "Does Technology Self-Efficacy Influence the Effect of Training Presentation Mode on Training Self-Efficacy?," *Computers in Human Behavior Reports* 4 (August 2021): 100124, <https://doi.org/10.1016/j.chbr.2021.100124>.

<sup>12</sup> John Short, Ederyn Williams, and Bruce Christie, *The Social Psychology of Telecommunications* (London: John Wiley & Sons, Ltd, 1976), <https://archive.org/details/socialpsychology0000shor/page/n7/mode/2up>.

<sup>13</sup> Karel Kreijns, Kate Xu, and Joshua Weidlich, "Social Presence: Conceptualization and Measurement," *Educational Psychology Review* 34, no. 1 (March 22, 2022): 139–70, <https://doi.org/10.1007/s10648-021-09623-8>; Chun-Ting Hsu, Wataru Sato, and Sakiko Yoshikawa, "Enhanced Emotional and Motor Responses to Live versus Videotaped Dynamic Facial Expressions," *Scientific Reports* 10, no. 1 (October 8, 2020): 16825, <https://doi.org/10.1038/s41598-020-73826-2>.

<sup>14</sup> Hasbiyati et al., "Assessing Self-Confidence Levels Among Students Engaged in Dubbing Video Activities," *Solo International Collaboration and Publication of Social Sciences and Humanities* 3, no. 03 (July 20, 2025): 551–60, <https://doi.org/10.61455/sicopus.v3i03.383>.

student populations, and single-method approaches, which restrict their ability to establish causal links, and their results to engineering combinations require testing. The gap requires investigation because it enables instructors to create assessment methods that use evidence to evaluate student skills and emotional preparedness and achieve equitable assessment standards in technical programmes.

This research employs a convergent mixed-methods approach, which uses a within-subject design to assess how live oral and video-recorded presentation formats affect undergraduate geodetic engineering students' self-reported confidence, presentation anxiety, and engagement. The study tests the following research questions and hypotheses:

1. Research Questions 1 (RQ1): Do live and video-recorded presentation formats produce different levels of student confidence?

Hypotheses 1 (H1): Students who watch video-recorded presentations will report higher confidence levels than they do after watching live presentations because of the mastery-based mechanisms which Self-Efficacy Theory describes.

2. Research Questions 2 (RQ2): Do live and video-recorded presentation formats produce different levels of presentation anxiety?

Hypotheses 2 (H2): The study found that anxiety levels between presentation formats did not differ after researchers controlled for participants' previous presentation experience and their assessment setting.

This study adds to existing research by using a within-subject design in a technical field study, by combining validated psychometric assessments with thematic analysis of student reflections and observer notes, and by developing practical teaching recommendations for engineering education blended presentation practice.

## METHOD

The research used a convergent mixed-methods design through which researchers gathered quantitative and qualitative data from the same study participants at the same time and assessed both data types separately before they combined the results. The researchers chose this design because it helped them compare live presentations with video presentations while keeping the study participants' basic communication abilities and emotional attributes constant.<sup>15</sup> The research team used joint displays to combine results with content interpretation because this method allowed them show how statistical results linked to qualitative research themes.<sup>16</sup>

Undergraduate students  $n = 35$  who were registered in a geodetic engineering program at an Indonesian public university. The students had to complete both a live presentation and a video presentation as part of the course requirement for their study program. All students who participated in the research study received voluntary participation rights, and the

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<sup>15</sup> John W. Creswell and Vicki L. Plano Clark, *Designing and Conducting Mixed Methods Research*, 3rd ed. (Los Angeles: Sage Publication, 2017).

<sup>16</sup> Michael D. Fetters, Leslie A. Curry, and John W. Creswell, "Achieving Integration in Mixed Methods Designs—Principles and Practices," *Health Services Research* 48, no. 6pt2 (December 23, 2013): 2134–56, <https://doi.org/10.1111/1475-6773.12117>.

researchers obtained written informed consent from all students before they gathered research data. The institutional review board of the host institution approved the ethical research study. The research team removed all identifiable details about the participants before they began their analysis, and they used anonymous identification codes to present participant quotations.

Researchers gathered numerical information by using self-report scales that assessed three factors of presentation confidence, presentation anxiety, and engagement with the presentation task. Confidence items were based on university students' academic self-efficacy, which describes their belief in their ability to complete tasks needed for future challenges.<sup>17</sup> The research team used established communication apprehension literature by McCroskey to create anxiety items while developing engagement items, which measured students' cognitive and behavioral participation in the presentation task.<sup>18</sup> The survey questions used a five-point Likert scale, which allowed respondents to select from options that ranged between 1 (strongly disagree) and 5 (strongly agree). The instruments were translated into Indonesian through a forward-backward translation process, which maintained cultural, linguistic, and conceptual understanding between the two languages, according to Beaton et al.<sup>19</sup> Two subject-matter experts evaluated the content validity of the study. At the same time, the researchers conducted pilot testing to assess whether the item wording was clear and suitable for its intended purpose.

Each participant completed both a live presentation and a video-recorded presentation. The researchers used counterbalancing to establish a sequence of presentation formats that created an equal distribution of conditions between the participants. For the video-recorded condition, students were permitted to rehearse and submit a single edited recording. After every presentation, participants filled out the quantitative questionnaires before writing about their presentation experience. The qualitative dataset consisted of these reflections. Presentation sessions took place during designated class times to maintain uniform environmental conditions throughout the study.

JASP software was used to perform quantitative analyses. The researchers conducted data screening before conducting inferential tests to check for missing data and outlier errors and to verify distributional assumptions. The researchers used Cronbach's alpha to evaluate scale reliability according to Field guidelines, which define internal consistency estimation methods.<sup>20</sup> The researchers used Shapiro–Wilk tests to evaluate both raw scale scores and paired difference scores between live and video conditions for normality assessment. The researchers used paired-samples t-tests to compare presentation formats because their normality testing results showed successful assumption testing. The researchers used

<sup>17</sup> A Bandura, *Self-Efficacy: The Exercise of Control* (Worth Publishers, 1997), [https://books.google.co.id/books?id=eJ-PN9g\\_o-EC](https://books.google.co.id/books?id=eJ-PN9g_o-EC).

<sup>18</sup> James C Mccroskey, *An Introduction to Rhetorical Communication*, 9th ed. (New York: Routledge, 2015), <https://doi.org/10.4324/9781315663791>.

<sup>19</sup> Dorcas E. Beaton et al., "Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures," *Spine* 25, no. 24 (December 2000): 3186–91, <https://doi.org/10.1097/00007632-200012150-00014>.

<sup>20</sup> Andy Field, *Discovering Statistics Using IBM SPSS Statistics (4th Edition)*, SAGE, 4th ed., vol. 4 (London: SAGE Publications, Inc., 2013).

Wilcoxon signed-rank tests to analyze outcomes, which showed paired differences that did not meet normality requirements as nonparametric testing methods. The researchers calculated effect sizes to measure the strength of observed differences through parametric analyses using Cohen's *d* for paired samples and nonparametric analyses through rank-biserial correlations.<sup>21</sup> The researchers conducted all statistical tests as two-tailed tests, which used a significance threshold of  $\alpha = .07$ , while they reported 95% confidence intervals to show estimation accuracy.

The qualitative data collection consisted of participants providing brief written reflections about their presentations. The researchers analyzed the data by using NVivo software through the application of the reflexive thematic analysis technique proposed by Braun & Clarke.<sup>22</sup> The two researchers began their work by using open coding on the subset of reflections, which resulted in the creation of initial codes. The team developed a codebook that included six major themes through the process of code refinement, which stemmed from multiple discussions about the initial codes. The team developed a codebook that contained six major themes through the process of code refinement, which stemmed from multiple discussions about the initial codes.

The two coders proceeded to use the complete dataset to perform independent coding according to the established codebook. The researchers used Cohen's kappa to evaluate inter-coder reliability, and they resolved any discrepancies through group discussions, which followed established protocols for assessing reliability in observational and qualitative studies.<sup>23</sup> NVivo matrix coding queries enabled researchers to obtain code frequency data and co-occurrence information while they used representative excerpts to demonstrate every theme.

### Integrating Quantitative and Qualitative

The researchers used a joint display method to combine their quantitative and qualitative results, which allowed them to directly compare their statistical results with their thematic elements.<sup>24</sup> The research team matched quantitative data, which included means, test statistics, and effect sizes, with qualitative data, which contained theme frequencies and co-occurrence counts and exemplar quotations for each outcome domain. The researchers conducted integration after they finished both analytic strands to maintain methodological independence because they wanted to keep qualitative results separate from quantitative results.<sup>25</sup>

The research design used within-subject testing and counterbalancing to improve internal validity. The research team used two methods to establish measurement validity

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<sup>21</sup> Jacob Cohen, *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed. (New York: Routledge, 2013), <https://doi.org/10.4324/9780203771587>.

<sup>22</sup> Virginia Braun and Victoria Clarke, "Using Thematic Analysis in Psychology," *Qualitative Research in Psychology* 3, no. 2 (January 21, 2006): 77–101, <https://doi.org/10.1191/1478088706qp063oa>.

<sup>23</sup> Kevin A. Hallgren, "Computing Inter-Rater Reliability for Observational Data: An Overview and Tutorial," *Tutorials in Quantitative Methods for Psychology* 8, no. 1 (February 1, 2012): 23–34, <https://doi.org/10.20982/tqmp.08.1.p023>.

<sup>24</sup> Fetters, Curry, and Creswell, "Achieving Integration in Mixed Methods Designs—Principles and Practices."

<sup>25</sup> Creswell and Clark, *Designing and Conducting Mixed Methods Research*.

through their testing of existing validated instruments and their expert assessment and pilot testing of the instruments.<sup>26</sup> The research team used two different testing methods to measure reliability, which included Cronbach's  $\alpha$  for scales and inter-rater reliability statistics for rubric scores.<sup>27</sup> The research used trustworthiness procedures to establish the credibility and dependability of the qualitative study. The research team acknowledges study limitations that stem from their use of one study site, their limited cohort size, and their dependence on self-report data. It details these limitations in the Limitations subsection.

## RESULTS AND DISCUSSION

### Results

#### Quantitative Results

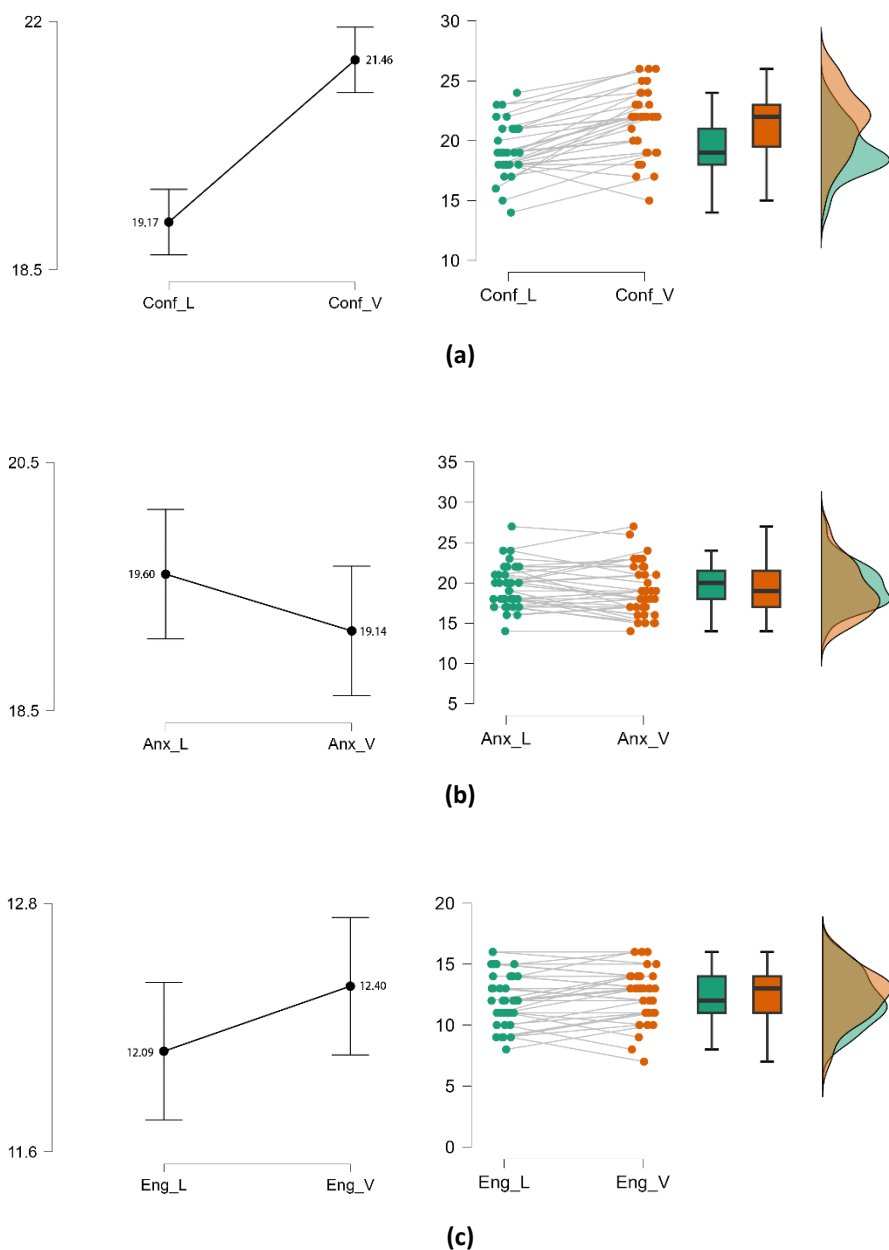
The confidence measure showed acceptable scale reliability through testing items from both live and video presentation conditions, which achieved a Cronbach's alpha score of 0.730 (SE = 0.070, 95% CI [0.593, 0.866], 12 items,  $n = 35$ ). The video presentation condition produced higher average confidence scores according to descriptive statistics, which showed mean confidence scores of 21.46 and 2.74 for video presentations and 19.17 and 2.22 for live presentations. The two conditions produced similar anxiety scores, which resulted in a mean score of 19.60 with a standard deviation of 2.71 for live presentations and a mean score of 19.14 with a standard deviation of 3.26 for video presentations. The two conditions produced comparable engagement scores, which resulted in mean values of 12.09 with a standard deviation of 2.16 for live presentations and 12.40 with a standard deviation of 2.17 for video presentations. Shapiro-Wilk tests showed that all separate scale distributions maintained their normal distribution pattern because all  $p$ -values remained above .05.

The researchers conducted paired-samples comparisons between live and video presentation conditions through both parametric and nonparametric testing methods. The paired-samples  $t$ -test showed a significant confidence difference between the two conditions,  $t(34) = -7.105$ ,  $p < .001$ , because the test produced a mean difference of -2.286 (SE = 0.322) from live to video. The effect size measurement showed large results because Cohen's  $d$  reached -0.893 while the 95% confidence interval extended from -1.281 to -0.495. The Wilcoxon signed-rank test produced  $W = 25.50$ ,  $z = -4.556$ ,  $p < .001$  results that matched this finding, while the Hodges-Lehmann estimate showed a result of -2.500 and a rank-biserial correlation of -0.909 (95% CI [-0.957, -0.811]).

The paired-samples  $t$ -test showed that there was no significant difference between live presentations and video presentations for anxiety, with  $t(34) = 1.260$  and  $p = .216$ , which resulted in a mean difference of 1.111 (SE = 0.457). The Cohen's  $d$  value measured at 0.363, with JASP output displaying its confidence interval. The Wilcoxon signed-rank test showed no significant difference with  $W = 278.50$  and  $z = 1.319$  and  $p = .186$ , while the Hodges-Lehmann estimate measured 1.177, and the rank-biserial correlation stood at 0.500 (95% CI [-0.128, 0.607]).

<sup>26</sup> Beaton et al., "Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures."

<sup>27</sup> Hallgren, "Computing Inter-Rater Reliability for Observational Data: An Overview and Tutorial."



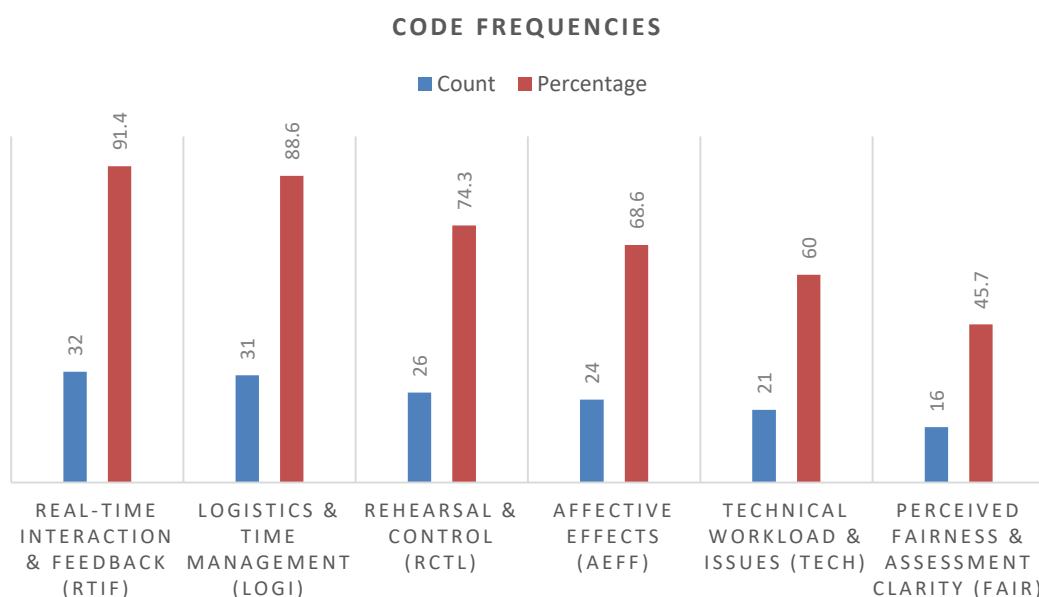
**Figure 1.** Descriptives and Raincloud plots ( $n = 35$ ) of: **(a)** Mean confidence scores for live (Conf\_L,  $M = 19.17$  ( $SD = 2.216$ ,  $SE = 0.375$ )) and video-recorded (Conf\_V,  $M = 21.46$  ( $SD = 2.737$ ,  $SE = 0.463$ )) presentations; **(b)** Mean anxiety scores for live (Anx\_L,  $M = 19.60$  ( $SD = 2.714$ ,  $SE = 0.459$ )) and video-recorded (Anx\_V,  $M = 19.14$  ( $SD = 3.264$ ,  $SE = 0.552$ )) presentations; and **(c)** Mean engagement scores for live (Eng\_L,  $M = 12.09$  ( $SD = 2.161$ ,  $SE = 0.365$ )) and video-recorded (Eng\_V,  $M = 12.40$  ( $SD = 2.172$ ,  $SE = 0.367$ )) presentations.

Paired-samples t-test results showed that there was no statistically significant difference between the two conditions, which tested for engagement  $t(34) = -1.360$ ,  $p = .183$ , because the mean difference of  $-0.314$  ( $SE = 0.231$ ) produced a small effect size (Cohen's  $d = -0.145$ , 95% CI  $[-0.477, 0.189]$ ). The analysis of paired differences revealed significant deviation from normal distribution as shown by the Shapiro–Wilk  $W$  statistic of 0.924 and the  $p$ -value of .019

which led to the reporting of nonparametric results. The Wilcoxon signed-rank test produced results of  $W = 120.00$  and  $z = -1.410$  and  $p = .151$ , while the Hodges–Lehmann estimate showed 1.289, and the rank-biserial correlation showed  $-0.500$  (95% CI  $[-0.645, 0.112]$ ).

### Qualitative Findings

The research collected qualitative information through the written post-presentation reflections, which all participants ( $n = 35$ ) submitted. The research team used six thematic categories from the established codebook to code each reflection. The researchers used binary indicators to show which codes were present or absent at the participant level, and they assigned multiple codes to one reflection.



**Figure 2.** Code Frequencies describe the existence of qualitative themes with higher count (left) and lowest count (right).

The researchers found through their analysis of coded reflections that participants commonly reported four particular themes about interaction and logistics, rehearsal, and emotional responses. Real-time Interaction and Feedback (RTIF) served as the primary theme, which appeared in 32 of 35 reflections (91.4%). The theme Logistics and Time Management (LOGI) appeared in 31 student reflections, which resulted in 88.6% of reflections showing this theme. The theme Rehearsal and Control (RCTL) appeared in 26 student reflections, which resulted in 74.3% of reflections showing this theme. The Technical Workload and Issues (TECH) theme appeared in 21 student reflections, which resulted in 60.0% of reflections showing this theme. The Perceived Fairness and Assessment Clarity (FAIR) theme appeared in 16 student reflections, which resulted in 45.7% of reflections showing this theme.

Participants wrote about multiple themes that appeared together in their reflections. The combination of Real-time Interaction and Feedback (RTIF) with Logistics and Time Management (LOGI) represented the most frequent co-occurrence, which appeared in 28

reflections. The researchers found that Rehearsal and Control (RCTL) was linked to Affective Effects (AEFF) based on evidence from 18 reflections and Technical Workload and Issues (TECH) based on evidence from 19 reflections. The researchers found Technical Workload (TECH) shared co-occurrence with Perceived Fairness (FAIR) based on evidence from 12 student reflections.

**Table 2.** Exemplar quotations by qualitative theme

Code	Theme	Focus	Exemplar Quotations
RCTL	Rehearsal and Control	References to rehearsal, re-recording, and control over final output	“I could re-record until I felt the delivery was smooth.” (P12) “If there is a mispronunciation, I can re-record. Mistakes can be cut or retaken.” (P21)
RTIF	Real-time Interaction and Feedback	Mentions of audience presence, immediate feedback, and live interaction	“The live session made me think on my feet when questions came up.” (P04) “I prefer live because I can interact with friends and read their reactions.” (P07)
TECH	Technical Workload and Issues	Descriptions of technical effort, editing, and equipment-related challenges	“Editing the video took a lot of time and technical learning.” (P21) “I struggled with audio levels and had to redo sections several times.” (P14)
FAIR	Perceived Fairness and Assessment Clarity	Statements related to grading criteria, equity, and assessment concerns	“I wasn’t sure how the rubric would treat editing advantages.” (P08) “Students with better equipment could make nicer videos—is that fair?” (P20)
AEFF	Affective Effects	Expressions of confidence, nervousness, or anxiety related to presentation format	“Recording reduced my nervousness because I could do takes.” (P12) “I was more anxious live, but it made my delivery more natural.” (P04)
LOGI	Logistics and Time Management	Mentions of time use, scheduling, and practical constraints	“Time spent editing could have been used for deeper content preparation.” (P06) “Scheduling live slots was difficult with conflicting timetables.” (P25)

*Note: Quotations are reproduced verbatim from participant reflections and anonymized using participant identification codes (P01–P35).*

Table 2 presents participant quotations that demonstrate each theme of the study. The report displays quotations exactly as they were spoken by participants who used participant identification codes to protect their identities.

### Quantitative–Qualitative Joint Display

The researchers conducted an integrated analysis that combined quantitative data with qualitative thematic results to evaluate each outcome domain. The joint display shows numerical results from paired statistical analyses together with the qualitative themes that participants shared in their reflections. The research team conducted integration after both quantitative and qualitative analyses were finished, while all data remained unchanged between different research segments.

The video presentation condition showed higher confidence scores than the live condition based on quantitative analysis results, which produced a paired difference that

reached statistical significance with a large effect size (paired  $t$ ,  $p < .001$ ; Cohen's  $d = -0.893$ , 95% CI  $[-1.281, -0.495]$ ). Participants used the qualitative data to code themes, which included Rehearsal and Control (RCTL) and Affective Effects (AEFF), with the first theme appearing in 26 reflections and the second theme appearing in 24 reflections. Analysis of co-occurrence showed that both themes appeared together in 18 reflections, which contained examples that described re-recording and editing activities while showing participants experienced reduced nervousness.

**Table 3.** Joint Display of Quantitative Outcomes and Qualitative Theme

Outcome domain	Quantitative result	Effect size (95% CI)	Qualitative themes (frequency)	Co-occurrence (n)
Confidence	Video > Live; paired $t$ , $p < .001$	Cohen's $d = -0.893$ $[-1.281, -0.495]$	RCTL (26), AEFF (24)	RCTL $\times$ AEFF = 18
Anxiety	No significant difference; paired $t$ , $p = .216$ ; Wilcoxon, $p = .186$	$d = 0.363$ (CI includes zero)	AEFF (24), RTIF (32)	RTIF $\times$ AEFF = 22
Engagement	No significant difference; paired $t$ , $p = .183$ ; Wilcoxon, $p = .151$	$d = -0.145$ $[-0.477, 0.189]$	RTIF (32), LOGI (31)	RTIF $\times$ LOGI = 28
Technical workload	Not quantified	—	TECH (21), LOGI (31)	TECH $\times$ LOGI = 19
Perceived fairness	Not quantified	—	FAIR (16), TECH (21)	TECH $\times$ FAIR = 12

The study showed that live presentations and video presentations had no statistically significant difference through both parametric and nonparametric testing methods (paired  $t$ ,  $p = .216$ ; Wilcoxon,  $p = .186$ ) because the effect size estimates showed confidence intervals that included zero. Participants reported their affective responses in qualitative data because Affective Effects (AEFF) were coded in 24 reflections, and Real-time Interaction and Feedback (RTIF) was coded in 32 reflections. The two themes appeared together in 22 reflections, with the qualitative corpus containing references to nervousness and calmness, and audience-related reactions, which were cited in the quotations. The analysis of engagement showed that the two presentation formats had no significant difference through statistical tests (paired  $t$ ,  $p = .183$ ; Wilcoxon,  $p = .151$ ), while the effect size estimates showed small values and their confidence intervals reached zero. The analysis of paired differences showed that the data did not follow a normal distribution, so researchers conducted both parametric and nonparametric tests to present their findings. Real-time Interaction and Feedback (RTIF) and Logistics and Time Management (LOGI) emerged as the most common themes in the qualitative findings, which appeared in 32 and 31 reflections, respectively. The two themes appeared together in 28 reflections, which contained participant comments about audience presence, timing, and scheduling matters.

The two themes of Technical Workload and Issues (TECH) and Perceived Fairness and Assessment Clarity (FAIR) failed to show any direct connection with the quantitative outcome

variables, which were documented in the paired analyses. The reflections contained 21 instances of coding for TECH and 16 instances for FAIR, while 12 reflections showed both codes. Participants used their statements about editing effort, equipment, and grading criteria to express these themes, which remained in the integrated display to show experience dimensions that quantitative scales did not measure.

## Discussion

This research used mixed methods to evaluate live and video presentation formats through three main outcome areas, which included confidence and anxiety, and engagement, by using both quantitative methods, which included paired tests, effect sizes, and confidence intervals, and qualitative methods, which included theme frequencies, co-occurrence patterns, and exemplar quotations. The study results demonstrated that video-recorded presentations provided participants with higher self-confidence levels. In contrast, presentation formats showed no impact on anxiety levels, and presentation formats did not affect engagement levels. The qualitative results provided contextual information, which showed that confidence-related experiences happened when people could rehearse and control situations. In contrast, people experienced anxiety and engagement differently during real-time interactions and logistical limitations.

The evidence from both quantitative measures and qualitative assessments showed that the video-recorded condition equipped with rehearsal and editing capabilities resulted in improved task-specific confidence levels. The pairwise comparisons showed a substantial standardized effect that benefited video-recorded presentations, while recurring qualitative themes of rehearsal and emotional experience appeared throughout participant reflections. This pattern conforms to Self-Efficacy Theory, which states that repeated successful control over learning tasks leads to improved belief in one's abilities.<sup>28</sup> Current studies demonstrate that organized practice activities, which allow students to enhance their skills, lead to increased confidence levels and better motivation in active learning settings.<sup>29</sup> Blended and online learning research demonstrates that educational techniques that boost student self-efficacy lead to higher student participation and competence assessments when students can track their progress and make performance adjustments.<sup>30</sup> Students demonstrated higher confidence in their tasks during the video-recorded condition than the live condition, which supports RQ1. At the same time, participants identified rehearsal and control as the main factors contributing to their confidence improvement.

The quantitative analysis did not find any significant difference between live presentations and video-recorded presentations regarding their capacity to induce presentation anxiety. The qualitative assessments showed that participants experienced

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<sup>28</sup> Bandura, *Self-Efficacy: The Exercise of Control*.

<sup>29</sup> Yavuz Sökmen, "The Role of Self-Efficacy in the Relationship between the Learning Environment and Student Engagement," *Educational Studies* 47, no. 1 (January 2, 2021): 19–37, <https://doi.org/10.1080/03055698.2019.1665986>.

<sup>30</sup> Min Young Doo and Curtis J. Bonk, "The Effects of Self-Efficacy, Self-Regulation and Social Presence on Learning Engagement in a Large University Class Using Flipped Learning," *Journal of Computer Assisted Learning* 36, no. 6 (December 19, 2020): 997–1010, <https://doi.org/10.1111/jcal.12455>.

different emotional states because some people reported less anxiety during recording sessions, while others experienced more anxiety during their live performances. These findings support current theories, which define social presence as a complex construct that affects emotional and mental processes in different ways for each person (recent meta-analytic evidence highlights variability in social presence effects on learning and engagement; Richardson et al).<sup>31</sup> Social presence may elevate immediacy and evaluative pressure in live formats, which results in increased emotional arousal for some learners while decreasing it for other learners. Research about online self-efficacy and anxiety shows that people experience multiple contradictions between their emotional states and their perceived ability to succeed because they experience digital learning environments, which reveal a connection between self-efficacy and anxiety, and others who need to maintain their social presence to control their anxiety levels.<sup>32</sup> The RQ2 hypothesis receives tentative support because the two formats produced no statistically significant difference in anxiety, which results in the conditional hypothesis remaining partially tested because H2 required no difference between formats after researchers accounted for previous presentation experience and assessment context, which the present study did not use through covariate-adjusted models.

The quantitative analysis showed no significant difference in engagement across different formats. In contrast, the qualitative data showed that engagement depended more on interactional design and logistical factors than on presentation format alone. Participants commonly described their engagement level as depending on whether the audience interacted with them through scheduled moments of audience exchange. The recent correlational research conducted in online learning environments shows that social presence and self-efficacy function as major indicators of student engagement, which educational programs should prioritize above their specific delivery methods (e.g., online environments where self-efficacy mediates the relationship between presence and engagement; Doo and Bonk, 2020).<sup>33</sup> The research demonstrates that interactive elements, which include structured Q&A sessions, peer feedback systems, and detailed logistical arrangements, will create more effective engagement results than selecting between live and recorded content formats. The primary quantitative scales of assessment failed to capture two important assessment design factors, which include technical workload and perceived fairness as qualitatively significant themes. Participants reported that editing requirements and different availability of technical resources created an unfair situation, which affected their view of equality between them. The research on digital learning equity shows that access to technology and necessary skills determine the emotional and academic achievement of students who learn through digital platforms.

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<sup>31</sup> Jennifer C. Richardson et al., "Social Presence in Relation to Students' Satisfaction and Learning in the Online Environment: A Meta-Analysis," *Computers in Human Behavior* 71 (June 2017): 402–17, <https://doi.org/10.1016/j.chb.2017.02.001>.

<sup>32</sup> Kreijns, Xu, and Weidlich, "Social Presence: Conceptualization and Measurement"; Ivan Iraola-Real et al., "Self-Efficacy and Digital Anxiety and Their Influence on Virtual Educational Performance," *International Journal of Emerging Technologies in Learning (IJET)* 18, no. 09 (May 10, 2023): 165–79, <https://doi.org/10.3991/ijet.v18i09.36183>.

<sup>33</sup> Doo and Bonk, "The Effects of Self-Efficacy, Self-Regulation and Social Presence on Learning Engagement in a Large University Class Using Flipped Learning."

The findings of this study provide two improvements to existing theoretical frameworks. The first finding shows that Self-Efficacy Theory expands through research, which demonstrates that video-recorded presentation practice with structured rehearsal and revision opportunities functions as mastery experiences that build task-specific efficacy. The finding shows that Social Presence Theory needs to be understood through the lens of how design elements and personal characteristics combine to create emotional responses that develop from immediate contact and evaluative pressure. The best way for instructors to build student presentation confidence is through structured rehearsal and revision opportunities. In contrast, presentation formats need scaffolds, clear rubrics, and technical support to control student anxiety while maintaining assessment fairness.

Three pragmatic implications follow from the integrated evidence. First, if instructors prioritize building presentation confidence, incorporating recorded, editable submission options (or hybrid assignments that include rehearsal-focused tasks) can create powerful mastery experiences that raise task-specific efficacy. Second, anxiety management requires more than format switching; targeted supports (scaffolded practice, low-stakes rehearsal, clear rubrics) are necessary because individual affective responses to social presence differ widely. Third, because participants raised concerns about technical workload and perceived fairness, instructors should separate content evaluation from production quality in rubrics and provide equitable access to basic recording resources or technical support.

The study has three main restrictions, which include its limited participant count of 35, its within-subject design, which experiences carryover effects despite using counterbalancing, and its short duration of written reflections. The conditional form of H2 (controlling for prior experience and assessment context) requires covariate-adjusted modeling (ANCOVA or mixed-effects models) to be fully tested because its testing needs this particular method of analysis. The study shows that students who use video recordings, which allow them to practice and improve their skills, achieve better confidence results. At the same time, their anxiety levels and engagement patterns depend more on how people interact with each other and their personal characteristics than on the format they use.

## CONCLUSION

The research used a convergent mixed-methods approach with a within-subject design to study the effects of live presentations versus video-recorded presentations. The quantitative research showed that students had much higher task-specific confidence in the video-recorded condition. However, there were no statistically significant differences between the two presentation formats regarding their presentation anxiety or their ability to engage with the content. The qualitative research findings supported these results by showing that students who watched the video content had higher confidence levels because they could practice their presentation through multiple re-recording sessions, after which they selected their best final presentation version. The audience's emotional response to anxiety and engagement showed different patterns of reaction because the audience experienced these responses through active engagement with the presentation. At the same

time, they faced both operational limitations and unique environmental conditions that existed during the presentation.

The research results show that students experience different effects from their presentation format. Students who watched video-recorded presentations developed higher confidence because the format provided them with structured learning paths that they could use to achieve mastery. Video-recorded presentations develop student confidence through structured learning paths, while live presentations require students to interact with others and build social connections. The results show that assessment methods that use presentations should combine different presentation sizes while implementing equity measures to create assessment systems that provide technical assistance and clear evaluation processes. The next studies should repeat these findings with larger participant groups and use covariate-adjusted models to examine how past experiences and assessment environments affect outcomes, and researchers should use experimental methods to study how rehearsal and social-presence elements function as mechanisms for study purposes.

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