Promoting Authentic Student Work through Video Presentations in the Age of Generative AI

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Introduction

In traditional lecture-based engineering courses, projects are frequently incorporated to facilitate the application of theoretical knowledge and the development of practical skills. The scope and significance of these projects vary according to the course's learning objectives, ranging from comprehensive analysis and deliverables to minimal participation-based assignments intended to promote engagement beyond classroom instruction. Furthermore, projects may be structured as individual or team-based tasks, depending on whether the emphasis is placed on developing teamwork skills or assessing individual performance and accountability.

Project findings are commonly communicated through written reports and oral presentations. Written reports are typically more formal and provide a detailed description of the project, its implementation steps, and in-depth analysis. However, the rapid development of AI tools and their ease of generating written documents have introduced significant technical and ethical challenges in ensuring that reports are genuinely created by students rather than outsourced to AI. As research [1] indicates, students increasingly use AI to assist in writing technical reports to varying degrees, and traditional plagiarism detectors often fail to identify text generated by AI tools. Moreover, as highlighted by [2], AI detection tools frequently generate false positives, particularly for non-native English speakers or multilingual students, who face a greater risk of having their work misidentified as AI-generated, raising concerns about fairness. Additionally, AI detection tools usage creates a risk of promoting a monitoring-focused environment diminishing trust and student engagement. The continuous evolution of AI tools further complicates reliable detection of misuse. In light of these challenges, research findings presented in [2, 3] suggest prioritizing the development of AI literacy and motivating students to produce genuine work, rather than imposing outright bans on AI usage.

For projects where technical writing skills are not the primary learning objective, oral presentations can serve as an effective alternative to written reports helping ensure authentic contributions and providing a mechanism to demonstrate a thorough understanding of the findings through Q&A sessions. In addition, oral presentations are essential for developing communication and professional presentation skills [4, 5]. However, this approach is often impractical in courses with large enrollments.

This paper focuses on an individual project-based assessment design in the presence of generative AI, with the aim of motivating students to genuinely engage with a topic of interest rather than outsource their work to AI tools. We examine the implementation of short video presentations to

report project findings in three lecture-based undergraduate Electrical and Computer Engineering (ECE) courses, one with large enrollment and two with small enrollment, at the University of Illinois Urbana-Champaign. The motivation behind this choice is that video presentations are a presumably more compelling alternative to traditional written reports. The presentation format also provides stronger evidence of student understanding, as students are required to explain their findings to an audience. In addition, students gain practice in technical presentation and public-speaking skills, as well as the ability to effectively communicate complex information. Last but not least, creating a high-quality video presentation is more difficult to outsource entirely to AI compared with generating a written report, thereby introducing barriers to uncritical or disengaged AI-generated work. Importantly, the goal of this study is not to detect or measure AI misuse, but to evaluate students' perceptions of whether the chosen assessment format is more motivating and engaging than their previous experiences.

In all courses, projects account for a small portion (5%) of the overall grade, with the primary learning objectives focused on encouraging students to broaden their knowledge beyond the classroom and to become familiar with the latest advancements in the field. Importantly, in all courses, technical writing skills are not a primary learning objective, which further supported the choice of a video-based assessment format. In this implementation, students submitted their videos asynchronously to accommodate class size and provide scheduling flexibility, while also encouraging deeper reflection by allowing students to record, review, and improve their work before submission [5, 6].

Methodology

Implementation

In Spring 2025 and Fall 2025, ECE instructors introduced an individual project in three lecture-based courses in addition to traditional homeworks and written exams. The list of participating courses includes:

1. ECE 333 is a 3-credit hour elective course in the field of renewable energy with a large enrollment, typically ranging from about 50 to 100 students each semester. In Spring 2025, the enrollment was 78. The overall grade distribution consists of homework (15%), exams (80%), and an individual project (5%).
2. ECE 459 is a 3-credit hour elective course on communication systems and random processes. Enrollment is typically small, with about 15-20 students each fall semester. In Fall 2025, the enrollment was 16. The overall grade distribution consists of homework (14%), exams (81%), and an individual project (5%).
3. ECE 461 is 3-credit hour elective course on digital communications. Enrollment is typically small. The course is offered every spring semester with about 10-20 students. In Spring 2025, 10 students were registered for the course. The overall grade distribution consists of homework (15%), exams (80%), and an individual project (5%).

During the first part of the semester, students received a project description asking them to create a short (5-minute) video presentation based on one peer-reviewed paper related to the course topics. The project was implemented as a final assignment and was due on the last day of classes.

Therefore, students had sufficient time to get the necessary technical background. AI tools were explicitly permitted for gathering resources, but students were required to verify that the resources were legitimate. For submission, students provided a PDF of the selected paper and the presentation slides along with the video.

Across all courses, students were provided with the same detailed instructions on slide preparation, the expected content for each slide, the required presentation duration, the permitted presentation size, and evaluation criteria. The evaluation criteria highlighted appropriateness and relevance of the selected paper, insightfulness of the critical evaluation, clarity, organization, and engagement of the video presentation as well as following the assignment requirements and meeting the time limit. While students across all courses received the same guidelines, the exact grading rubrics and point distribution were determined by the course instructor.

It is worth noting that students were not prohibited from using AI to assist with slide creation or other project tasks. However, they were evaluated on the quality of their slides and the effectiveness of their delivery. As of Spring 2025, most commonly used AI tools were not capable of producing high-quality images or slides. Moreover, generating an acceptable video presentation solely through AI remains challenging due to various risks including misinterpretation of technical terminology, reliance on generic explanations, and misalignment between audio and visual content. Even if a student were to read an AI-generated script, the resulting presentation would likely not receive high scores in terms of depth, critical insight, and overall engagement. Overall, the course staff did not observe any obvious use of AI. While some content may have been supported by AI tools, the smooth integration would rather indicate appropriate use of AI as an aid to the human author. Nevertheless, given the rapid development of AI technologies, the authors may revisit and refine the evaluation criteria in future course iterations.

Survey Design

In order to evaluate students' perceptions of the video presentation format of reporting, a survey was designed and distributed at the end of the Spring and Fall 2025 semesters. The survey aimed to gather students' opinions about video presentations compared to their general prior experience delivering findings through written reports given that the participants were juniors and seniors who had presumably completed similar written assignments in other courses. The survey contained the following questions:

1. To what extent do you believe the video presentation format is more engaging than a written report format ?
2. To what extent do you believe the project better motivates you to review the latest trends in the field compared to a written report format ?
3. To what extent do you believe the project is more time consuming than a written report format ?
4. To what extent do you believe the project is presented more challenges than a written report format ?
5. To what extent do you prefer the video format than a written report format ?

6. Approximately how much time did you spend on the video project ?

All questions except the last one were evaluated on a Likert scale from 1 (much less or prefer much less) to 5 (much more or prefer much more). For the last question (Q6), students selected the number of hours spent (0 to 10). The range of hours was determined based on the expected time commitment.

Findings

This section presents the results of the survey. In total, 20 students participated in ECE 333, 13 in ECE 459, and 10 in ECE 461.

Findings on overall student perceptions of the video presentation format.

Table 1 reports the mean, standard deviation, and response percentages for each survey question across all three courses.

Item	Mean	SD	Top-box % (4-5)	Mid-box % (3)	Bottom-box % (1-2)
Q1 (Engaging)	4.09	0.92	67.4	30.2	2.3
Q2 (Motivates reviewing latest trends)	3.79	0.91	65.1	25.6	9.3
Q3 (More time-consuming)	3.16	1.29	41.9	18.6	39.5
Q4 (More challenging)	3.19	0.96	44.2	27.9	27.9
Q5 (Prefer video presentations)	3.74	1.22	67.4	11.6	20.9
Q6 (Hours spent)	5.65	2.11	—	—	—

Table 1: Mean, standard deviation (SD), and percentages for each question.

Here, the top-box category indicates the percentage of students who selected options 4 or 5 on the Likert scale, the mid-box percentage reflects the students who selected option 3, and the bottom-box percentage includes those who selected 1 or 2. The findings show that a majority of students (67.4%) demonstrated a positive attitude toward the video report format and found it more engaging compared with their prior experience with written reports. Additionally, 65.1% of students agreed that the video reports motivated them to review the latest trends in the field. However, students' perceptions of the time burden and challenges associated with the assignment were more mixed. The results show 41.9% and 44.2% of students selected 4 or 5, while 39.5% and 27.9% selected 1 or 2, suggesting a potential benefit-versus-workload tradeoff. The findings also indicate that students spent 5.65 hours on average on creating the video presentation which is in line with the expectations based on the number of credit hours and percentage of the overall grade.

Nevertheless, most students (67.4%) preferred the video presentation format over traditional written reports. Interestingly, while only 2.3% found written reports more engaging, 20.9% still expressed a strong preference for them. This preference may be related to the video presentation format being perceived as more challenging and time-consuming, as indicated by the data. Additionally, the perception that generative AI makes written reports easier to produce, whereas creating a high-quality video presentation requires greater effort, may also influence students' preferences.

Findings on differences in perceptions across courses.

Next, we examine the students' perception on the video presentation format for each individual course. The results are presented in Table 2.

	ECE 333 (n=20)		ECE 459 (n=13)		ECE 461 (n=10)	
Item	Mean	Top-box % (4–5)	Mean	Top-box % (4–5)	Mean	Top-box % (4–5)
Q1 (Engaging)	3.90	60.0	4.23	69.2	4.30	80.0
Q2 (Motivates reviewing latest trends)	3.50	50.0	4.08	76.9	4.00	80.0
Q3 (More time-consuming)	2.80	30.0	3.46	53.8	3.50	50.0
Q4 (More challenging)	3.00	35.0	3.38	53.8	3.30	50.0
Q5 (Prefer video presentations)	3.65	60.0	3.92	76.9	3.70	70.0
Q6 (Hours spent)	4.75	—	6.38	—	6.50	—

Table 2: Comparison of mean, standard deviation (SD), and percentages for each course.

Figure 1 highlights the comparison of the means for the course with the large enrollment (ECE 333) and courses with small enrollment (ECE 459 and ECE 461).

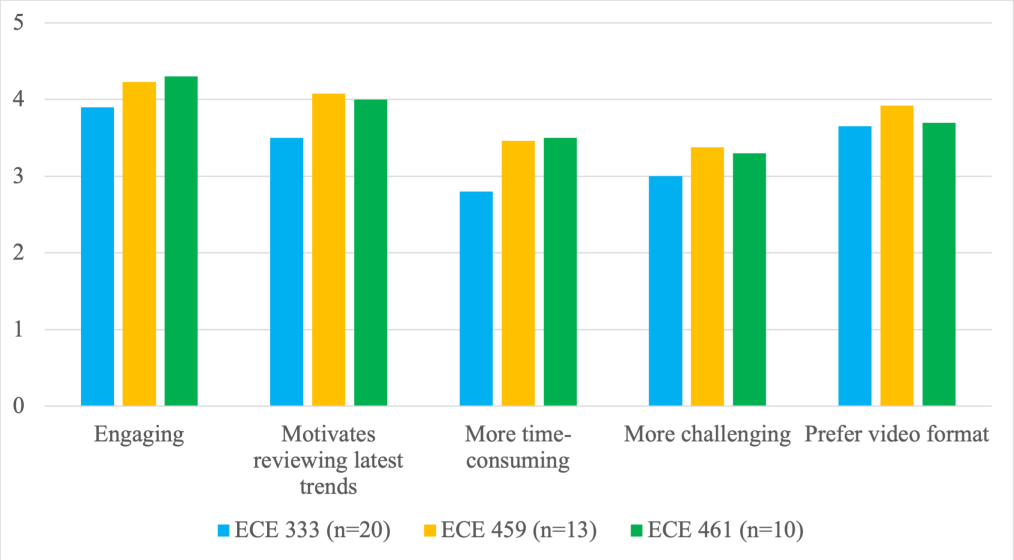

Figure 1: Comparison of means between courses.

Generally, students in the small-enrollment courses exhibited a higher or similar preference for the video presentation format (3.92 (ECE 459) and 3.70 (ECE 461), compared with 3.65 (ECE 333)).They also reported more positive perceptions of the video format across the remaining survey questions. However, they simultaneously indicated that the video reports were more time-consuming and more challenging.

The comparison of top-box percentages presented in Figure 2 shows a similar trend, with the small-enrollment courses (ECE 459 and ECE 461) demonstrating higher percentages than the large-enrollment course (ECE 333).

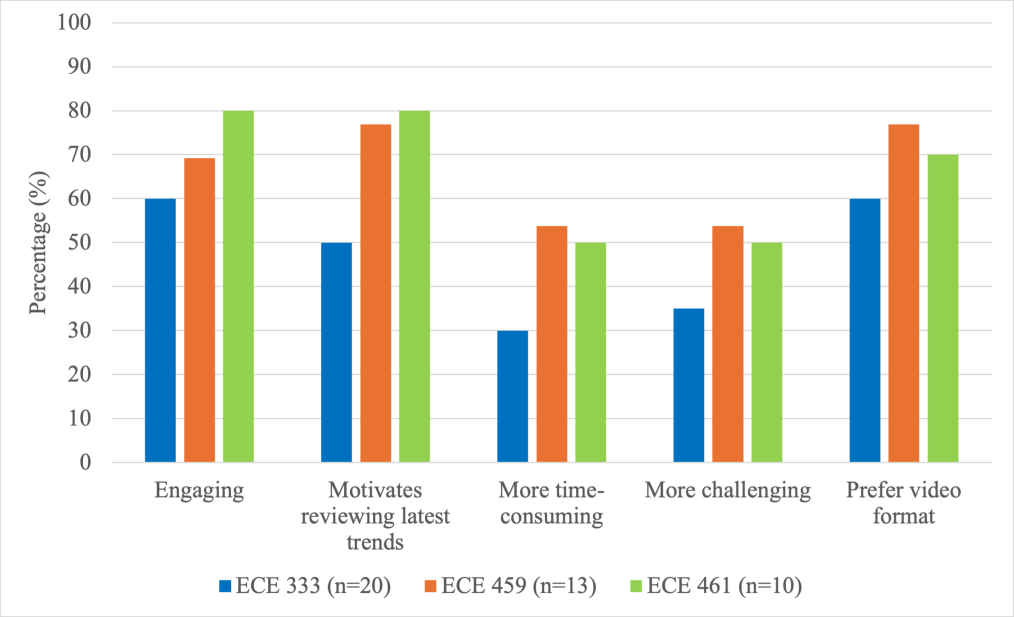

Figure 2: Top-box percentage (Likert scale 4 and 5) by courses.

Specifically, 76.9% and 70% of students in ECE 459 and ECE 461, respectively, expressed a strong preference for the video presentation format, compared with 60% in ECE 333.

Nevertheless, the independent-samples Kruskal–Wallis tests results (Table 3) for questions Q1-Q5 across all Likert items indicated that no statistically significant differences were observed among courses (all $p > 0.05$).

Questions	H	df	p
Q1	1.550	2	0.461
Q2	3.774	2	0.151
Q3	3.057	2	0.217
Q4	1.271	2	0.530
Q5	0.549	2	0.760

Table 3: Kruskal–Wallis tests comparing Likert-scale survey items across three courses ($N = 43$).

The findings suggest that students reported similar perceptions of the video project experience regardless of the course. This may be attributed to the fact that all students were enrolled in elective, junior-senior-level classes, where course selection is often driven by genuine interest in the subject. As a result, students may be more motivated to learn about emerging trends and prioritize more engaging, interactive assignments rather than focusing solely on grades or the easiest path to a high score. Additionally, the data indicates that course size does not influence students' preferences. This could be because students are not required to be physically present or plan their schedules around in-class presentations, including the number of presenters. Therefore, the number of students in the course has little impact on their experience.

Findings on time commitment and workload patterns.

Next, we examine the video project time commitment for each individual course (Q6). The results are shown in Figure 3.

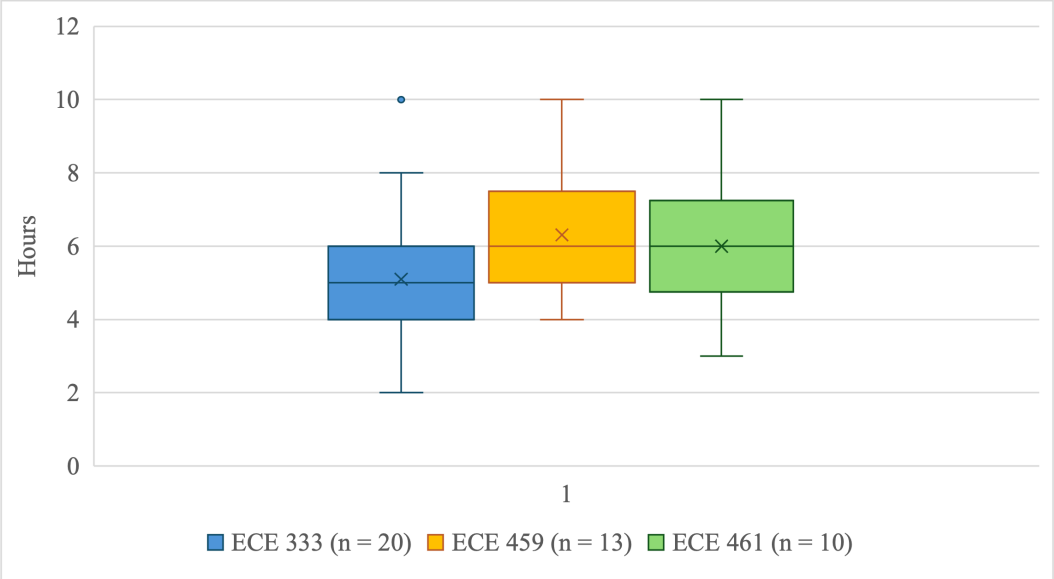

Figure 3: Comparison of hours spent on the video report in each course.

In each box plot, the center line represents the median time spent, the box represents the interquartile range (IQR), encompassing the middle 50% of the data, and the whiskers show the overall range of the data excluding outliers. The "×" mark indicates the average value for each course. The number of responses (n), mean (M), and standard deviation (SD) are presented in Table 4.

Course	n	M (hours)	SD
ECE 333	20	4.75	1.55
ECE 459	13	6.38	2.14
ECE 461	10	6.50	2.51

Table 4: Descriptive statistics for hours spent on the video project by course ($N = 43$).

The findings suggest that students enrolled in higher-level courses with fewer students (ECE 459 and ECE 461) spent a higher median and average amount of time on their projects compared to students in ECE 333. Also, the smaller classes showed greater variability in the time students spent on the projects, which indicated that some students spent significantly more time on the projects.

Additionally, one-way ANOVA analysis results indicate statistical significance on number of hours spent, ($F(2, 40) = 3.87$, $p = 0.029$), with a medium effect size ($\eta^2 = 0.162$) suggesting that students in ECE 459 and ECE 461 spent more time on the project than students in ECE 333.

Findings of the correlation analysis.

Finally, we examined the results of the correlation analysis across all responses. The analysis explored students' preference for the video presentation format in relation to their perceived engagement, motivation to review recent trends, perceived time burden, and the number of hours spent. Spearman correlation analyses (N = 43) revealed a moderate positive relationship between preference for the video format and perceived engagement ($r \approx 0.60$). There was also a moderate positive correlation between preference and motivation to review recent trends ($r \approx 0.57$). However, preference for the video format was moderately negatively correlated with the perception that the project was more time-consuming than a written report ($r \approx –0.43$). The relationship between preference and the actual number of hours students reported spending on the project was weak ($r \approx –0.01$). This suggests that students' perceptions of workload are more strongly associated with their preferences than the actual time they spent. Overall, these results indicate that students generally prefer the video presentation format, even when the assignment may require additional time.

Limitations

This section discusses the practical limitations of the video presentation format. First, due to the continuous and rapid evolution of AI tools, instructors may need to periodically review and adjust assignment design and evaluation criteria to ensure alignment with learning goals. Second, the method is not intended for courses in which technical writing and communication are primary learning objectives. The format also limits the depth of evaluation compared with oral presentations or other assessments that allow real-time follow-up questions, making it more difficult to fully assess students' understanding. Finally, video presentations do not provide opportunities for active audience engagement, such as maintaining eye contact or practicing other communication skills that require in-person interaction. Therefore, video-based presentation delivery is not an optimal solution for capstone, project-focused, or other courses where the development of students' technical oral and written communication skills is a primary learning objective. Last, but not least, the video presentation format may pose challenges for students with certain disabilities, such as speech disorders, and may require appropriate accessibility accommodations.

Conclusions

This paper examines the use of short video presentations as an alternative method for communicating project outcomes in three undergraduate lecture-based Electrical and Computer Engineering courses. With generative AI tools becoming increasingly accessible to students, there is a clear need to reconsider assessment practices that traditionally rely on written reports. The goal of this work is to understand how junior and senior level students across courses of different sizes and disciplinary areas respond to this alternative format.

The findings indicate that students generally reported positive experiences with the video presentation format. A majority of students across all courses agreed that the format was more engaging than written reports and motivated them to explore recent developments in the field. No statistically significant differences in perception were observed among the courses, indicating that

neither the technical area nor the class size affected students' experiences. At the same time, students noted that creating a video presentation required more time and effort than writing a report, with those enrolled in smaller, higher-level courses (ECE 459 and ECE 461) spending more time on the project compared to students in ECE 333. Correlation analysis further shows that students' preferences were more closely associated with perceived engagement and motivation to review current trends than with the actual number of hours spent on the assignment.

In summary, the findings suggest that video presentations can be a useful alternative to written project reports in the presence of generative AI. Although the format is not as strong as an in-person oral presentation and may be less suitable for project-focused courses due to its limitations, it can still serve as an effective assessment option, particularly in large, traditional lecture-based courses where the project constitutes only a small portion of the overall grade and where instructors may not have the capacity to allocate class time for in-person presentations.

References

[1] R. D. Manteufel, R. L. Hood, A. D. Crom, and A. Karimi, "Uses and misuses of ai-assisted writing in engineering reports," in *2024 ASEE Annual Conference & Exposition*, 2024.

[2] P. D. Deep, W. D. Edgington, N. Ghosh, and M. S. Rahaman, "Evaluating the effectiveness and ethical implications of ai detection tools in higher education," *Information*, vol. 16, no. 10, p. 905, 2025.

[3] K. Khatry and R. Samsami, "Engineering education in the era of generative artificial intelligence (gen ai): Current state and future directions," in *2025 ASEE Northeast Section Conference*, 2025.

[4] T. J. Siller, A. A. Maciejewski, A. M. Leland, T. Chen, B. M. Notaros, S. Roy, and A. C. Hicks, "Using student video presentations to develop communication skills," in *2018 ASEE Annual Conference & Exposition*, 2018.

[5] M. Mirabolghasemi, "A survey of alternative modes of technical communication in engineering laboratory courses," in *2023 ASEE Annual Conference & Exposition*, 2023.

[6] T. VanDeGrift, "Giving voice to problem-solving: Hearing students' techniques in video reflections," in *2024 ASEE Annual Conference & Exposition*, 2024.