

This work is licensed  
under a Creative  
Commons Attribution  
4.0 International  
License.

# Combining analog and digital approaches to student collaborations

**iD Michael Barr**

*Kyoto University of Foreign Studies*  
[m\\_barr@kufs.ac.jp](mailto:m_barr@kufs.ac.jp)

**iD Brian Bachman**

*Kyoto University of Foreign Studies*  
[b\\_bachma@kufs.ac.jp](mailto:b_bachma@kufs.ac.jp)

**iD Alexander Carroll**

*Kyoto University of Foreign Studies*  
[a\\_carrol@kufs.ac.jp](mailto:a_carrol@kufs.ac.jp)

This paper describes findings from a study that integrated analog and digital tools in collaborative projects among university student groups in an intra-institutional setting. The research explores how combining instant photography and artificial intelligence (AI)-supported communication analysis can enhance student engagement and collaboration across institutions and cultures. Participants used Kodak Mini Shot 3 instant film cameras to capture scenes from their university life both on and off campus. These physical photographs served as prompts for creating captions, audio recordings, and posters, adding a tangible, human element to group exchanges beyond the classroom. The digital component used ChatGPT to analyze a large digital archive of student-created content. This analysis revealed participation patterns, communication trends, common linguistic errors, and student preferences. These insights helped instructors better understand student communication styles and offered both targeted feedback as well as relevant teaching content. Findings suggest that physical media can strengthen interpersonal connection in digital learning environments, while AI tools provide scalable methods for supporting and evaluating collaboration. This multi-modal approach offers practical insights and methodology for educators designing intercultural learning experiences that are both data-informed and personally meaningful.

**Keywords:** collaborative learning, physical media, AI analysis, student engagement

## Introduction

In the fall semester of the 2024 academic year, at a private Japanese university, three instructors attempted to address a common classroom challenge: how to encourage student collaboration and maintain motivation in an era dominated by screen-based learning. Their project aimed to combine analog and digital modalities to enhance motivation, provide communicative opportunities, and increase engagement between student groups. While digital platforms offer convenience, they can fall short of fostering connection and interaction between participants, particularly due to reduced opportunities for spontaneous communication and relationship-building (Moore & Kearsley, 2012). The instructors hypothesized that incorporating physical media could counteract the effects of digital fatigue, encourage more deliberate expression, and strengthen bonds among students.

This study involved six mixed-level student groups from first, second, and third-year English majors enrolled in required communication courses. These students had limited prior interaction, in part due to the university's system of streaming required classes based on English proficiency tests. By facilitating intra-institutional collaboration across cohorts, the project aimed to address motivational gaps among students and promote department-wide community building. Furthermore, the integration of ChatGPT analysis enabled automated linguistic analysis and feedback, adding a data-driven layer to the instructors' content design process.

### *Digital fatigue and the need for tangible learning*

As digital learning environments become increasingly prevalent, concerns about digital fatigue – a form of cognitive exhaustion resulting from prolonged screen-based interaction – have grown (Castro et al., 2025). Students in online and technology-mediated environments often report feelings of disconnection and reduced motivation, which can negatively affect both academic performance and social engagement (Castro et al., 2025; Swan, 2002). These challenges are particularly evident in collaborative contexts, where the absence of nonverbal cues and spontaneous interaction can limit the development of interpersonal connection (Moore & Kearsley, 2012).

In response, scholars have emphasized the importance of reintroducing physical and sensory elements into instructional design in increasingly digital learning environments (Kalantzis & Cope, 2012; Mangen & Kuiken, 2014). Research has shown that analog materials, such as handwriting, physical photographs, and craft-based activities, can foster deeper emotional engagement and memory retention (Mangen & Kuiken, 2014). These tactile learning experiences may help “ground” digital interactions in embodied experience, thereby improving both concentration and interpersonal communication (University of Michigan, 2021).

### *The pedagogical value of collaborative learning*

Collaborative learning is widely recognized for its benefits to student motivation and academic success. Group-based projects promote the development of higher-order thinking, self-regulation, and social cohesion (Johnson et al., 2014). These effects are particularly strong when students are given authentic tasks that require joint

decision-making, creativity, and negotiation. Examples include planning meetings, choosing themes, and designing the layout of a physical poster as a group.

The present study builds on these findings by embedding collaboration with analog media into a cross-cohort learning experience. This blending of modalities echoes recent research, which suggests that combining physical and digital tools can improve student agency and engagement (Kalantzis & Cope, 2012). A large-scale longitudinal study across 17 US institutions found that collaborative learning exerted a significant and positive influence on students' academic motivation levels across their undergraduate education (Loes, 2022).

### *AI in language learning and assessment*

Recent advancements in AI have expanded its role in education from content delivery to real-time feedback and assessment. In language learning, tools like ChatGPT offer powerful opportunities for analyzing student-generated content, identifying linguistic patterns, and generating personalized instructional interventions (Zou et al., 2023). Optical Character Recognition (OCR)-enhanced AI models now allow handwritten student work to be processed and analyzed at scale, unlocking new potential for examining multimodal outputs such as posters, annotations, and diagrams (Sun, 2024).

However, AI should be used as a support tool rather than a replacement for human judgment, and its insights are most effective when paired with reflective, pedagogically grounded human intervention (Fuchs, 2022). In the present study, instructors used ChatGPT 4.0 to identify common language issues, incorporating these patterns into follow-up instruction.

### **Project methodology**

In this project, Kodak Mini Shot 3 instant print cameras were used by students to produce photos in real time. These resources were purchased on the budget of an in-house research project. Instant photo cameras were chosen because they provided a physical and tactile medium, introduced the element of deliberateness in the students' choice of content, and allowed only a finite number of photographs. This "scarcity" was intended to make students' engagement more meaningful. Additionally, the cameras were novelty gadgets that served as a motivational jumping-off point for the activity, with one student noting that "it was interesting having a camera to share with our group rather than using our own phones".

Each camera can take photos and print them immediately. Cameras do not save photos, so student groups must decide whether to print a photo once taken. Each group was provided with a cartridge with only ten possible prints for their portion of the project.

In phase one, students were grouped into cohorts of four. Students brainstormed a plan for ten photos on the theme of "campus life". After creating a plan, groups were allowed to explore campus for a pre-determined time with one instant camera and a single film cartridge. The next phase of the project was the creative phase: sharing printed photos within their cohort, arranging them on poster boards, and

creating captions. Crayons, markers, Post-it notes, and other materials were provided, enabling students to manipulate their photos as if they were making an “analog” version of what they commonly produce on digital social media platforms.

Students were asked to share actual elements of their daily campus life. In the digital world, the recent smartphone application “Be Real” requires users to take a photo when an alert goes off, forcing them to capture their real-life activities. This project aimed for a similar theme of capturing an un-filtered experience using real photographs of student life, including cafés, shopping areas, lunch spots, or even the smoking area.

The second phase of the project concerned aspects of off-campus student life. The instant cameras used for the project can also print photos from external sources via a free proprietary application and Bluetooth connection. This added flexibility while maintaining the deliberate aspect of planning for a limited number of physical photos. Students collected photos showing aspects of their daily lives, such as pets, collections, food, part-time jobs, or weekly activities. Results were legitimate, personal, and most importantly, student curated, offering a visual insight into their lives as undergraduates. Again, cohorts had to work together closely to select and display a collection of representative photos. By the end of the second phase of the project, each group had created four physical panels of photos and captions in the A3 size: two posters about “Campus Life” and two about “Student Life” outside campus.



Note. a) Campus life; b) Student life off campus

**Figure 1.** Sample posters

In the third phase, an audio component accessible via QR codes was added to each panel. Each member of the group was responsible for one of the panels and had to explain or narrate the photos and captions. They were encouraged to add value by providing extra commentary in addition to the captions. This required additional collaboration and planning while compiling information from all group members.

Audio recordings – usually recorded via smartphone – were submitted to their professor, who created QR codes linking to the associated audio files and hosted on Google Drive as an online resource. Scanning the QR codes allowed viewers to hear the additional commentary. The final component of the project was a public display in a central area of the university with high foot traffic. Panels were set up and displayed publicly, with visitors encouraged to leave comments on Post-it notes, replicating an “analog” version of social media likes and comments.



**Figure 2.** Student work displayed on campus in a public space

## ChatGPT analysis of student work

ChatGPT 4.0 was used for analysing the student-generated posters. The final data set included over 60 posters created by students to document their campus life experiences. To glean pedagogical insights from this dataset, ChatGPT 4.0 was employed to conduct large-scale linguistic analysis.

A key motivation for using ChatGPT 4.0 was its ability to uncover recurring linguistic trends and stylistic patterns that might otherwise go unnoticed through manual review. ChatGPT was used to identify frequent grammatical issues as well as broader tendencies in student writing, listed below. These insights informed future curriculum design and enabled instructors to better scaffold future student writing.

A central feature that made ChatGPT 4.0 particularly suitable for this analysis was its integration of Optical Character Recognition (OCR), which provides the user with the ability to extract text from English handwritten images. Introduced in 2023 and improved with the release of GPT-4 in 2024, this functionality allowed the research team to process scanned poster content efficiently. Using ChatGPT 4.0, batches of ten poster images were analyzed at a time. An example prompt that was used when uploading photos of the work was as follows: “Analyze these examples of student handwriting for language trends, common mistakes, and usage patterns. Then, list key findings and provide two examples of each finding, including the image filename.”

Through this process, five key findings emerged from the linguistic analysis:

### 1. Omission of articles

Students frequently omitted definite and indefinite articles (“a,” “an,” “the”) even when grammatically required.

### 2. Overuse of present tense

The present tense was consistently applied, even in contexts that called for past or future verb forms.

### 3. Fragmented sentence structures

Many captions consisted of disconnected phrases or incomplete thoughts, lacking syntactic cohesion.

### 4. Emotionally rich, structurally sparse writing

Students expressed strong emotions using simple language, often without supporting context or elaboration.

## 5. Preference for descriptions over narratives

Rather than narrating events in sequence, students tended to offer descriptive snapshots of scenes, feelings, or objects.

These findings were substantiated by representative examples. For instance, “I go to live house” demonstrated both article omission and tense misuse. Another caption read, “Talk and laugh with friends when free time between classes,” exemplifying sentence fragmentation. Emotional expressions such as “I was so nervous!” appeared frequently yet were often unsupported by explanation or detail. Descriptive clusters like “Family Mart. Ice cream in summer. Warm soup in winter.” illustrated the tendency to favor sensory listing over narrative development.

## Discussion

Each of the findings from the analysis carries clear pedagogical implications. Article omission and tense misuse were addressed through focused grammar mini-lessons and revision activities using student-generated content. Fragmented sentences offered opportunities for collaborative sentence-building exercises. Emotional vocabulary could be enriched through scaffolding activities that paired feelings with underlying explanations or reflections.

In total, 60 posters were analyzed by ChatGPT 4.0, and the collected data contained roughly 4,500 words. This proved to be time-efficient, while reducing the potential for human error due to fatigue and inconsistency. Additionally, automated analysis discovered patterns that would be more difficult to find manually, highlighting the benefits of timesaving and scale.

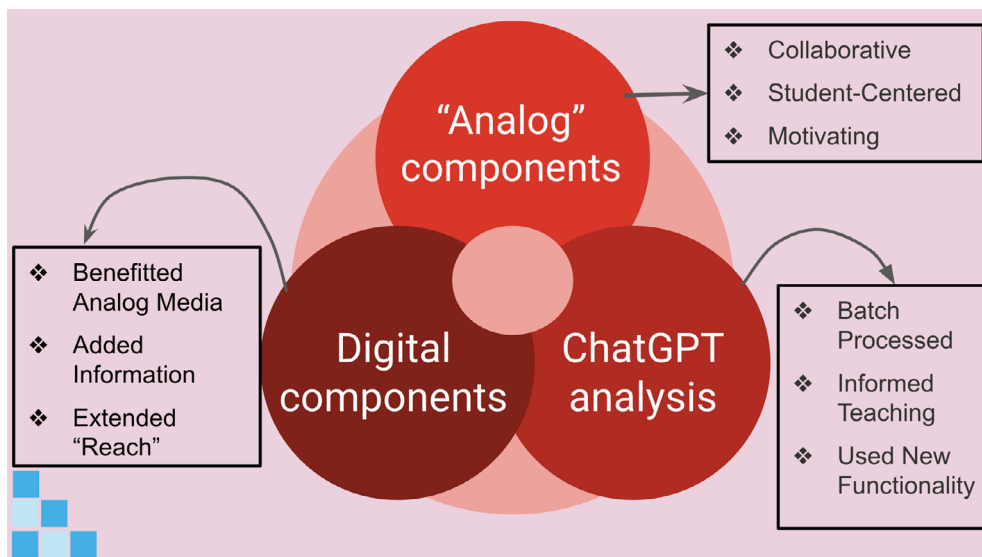
The community engagement embodied in the display portion of the project was tangible, immediate, and shareable. Furthermore, student interaction existed outside the confines of regular classes, bridging the gap between different classes, years, English proficiency levels, and majors. In addition, over ten participants from one of the classes were seen to take photos of their posters and comments, which they then uploaded to digital social media, completing the full circle from analog to digital engagement.



JALTCALL

*Trends*

Vol. 2 No. 1  
2025 JALTCALL  
Conference Papers  
Special Issue



**Figure 3.** Analog, digital, and AI components

## Conclusion

The authors feel that the combination of digital components, physical media, and AI-analysis benefited students as they collaborated on an intra-university project. This project demonstrated that combining analog tools with digital analysis can foster meaningful collaboration and engagement in language learning environments. The use of instant film photography encouraged students to make deliberate, creative decisions, while the physicality of the medium invited deeper emotional expression and interpersonal connection. These tangible artifacts showed student work and encouraged dialogue. The addition of audio narration and public exhibition expanded communicative opportunities beyond the classroom, creating chances for authentic expression and interaction.

Simultaneously, the integration of ChatGPT allowed instructors to analyze large amounts of handwritten student work efficiently and insightfully. The ability to extract and examine linguistic patterns at scale provided valuable data for curriculum refinement and targeted feedback. By bridging the digital and physical dimensions of student collaboration, this project offers a repeatable model for educators aiming to humanize language learning while leveraging the strengths of AI technologies. Ultimately, the findings highlight the potential of multimodal, cross-cohort projects to increase student motivation, creativity, and communicative confidence.

## References

- Castro, A. R. C., Lumanog, M. R. P., Seguiro, G. D., Tumpag, C. J. C., Cabatac, R. T. (2025). Digital learning fatigue and students' learning motivation: A descriptive-correlational study. *EPRA International Journal of Multidisciplinary Research (IJMR)* 11(5), 1057–1067. <https://doi.org/10.36713/epra21825>
- Fuchs, C. (2022). Critical reflections on AI in education: Between tool and ideology. *Journal of Media Ethics*, 37(1), 1–15.

- Johnson, D. W., Johnson, R. T., & Smith, K. A. (2014). Cooperative learning: Improving university instruction by basing practice on validated theory. *Journal on Excellence in College Teaching*, 25(4), 85–118.
- Kalantzis, M., & Cope, B. (2012). *New learning: Elements of a science of education*. Cambridge University Press.
- Loes, C. N. (2022). The effect of collaborative learning on academic motivation. *Teaching and Learning Inquiry*, 10(2).  
<https://doi.org/10.20343/teachlearninqu.10.4>
- Mangen, A., & Kuiken, D. (2014). Lost in an iPad: Narrative engagement on paper and tablet. *Scientific Study of Literature*, 4(2), 150–177.  
<https://doi.org/10.1075/ssol.4.2.02man>
- Moore, M. G., & Kearsley, G. (2012). *Distance education: A systems view of online learning* (3rd ed.). Wadsworth.
- Sun, Y. (2024). AI-supported feedback in multimodal composition: Potentials and pitfalls. *Computers and Composition*, 72, 102099.
- Swan, K. (2002). Building learning communities in online courses: The importance of interaction. *Education, Communication & Information*, 2(1), 23–49.  
<https://doi.org/10.1080/1463631022000005016>
- University of Michigan. (2021). *Using physical movement to increase student engagement and learning*. <https://lsa.umich.edu/technology-services/news-events/all-news/teaching-tip-of-the-week/using-physical-movement-to-increase-student-engagement-and-learning.html>
- Zou, B., Huang, Y., & Xie, H. (2023). The role of AI in promoting personalized language learning: A review. *Language Learning & Technology*, 27(1), 45–63.

## Author biodata

**Michael Barr**, Associate Professor at Kyoto University of Foreign Studies, has a background in world history, humanities and linguistics. He currently teaches Kyoto Studies, US History, Society, & Culture, Global Tourism, and Intercultural Communication. He is interested in interinstitutional research and collaboration, particularly exploring the use of new learning technologies.

**Brian Bachman** is an assistant professor at Kyoto University of Foreign Studies. His professional background is in urban planning and language teaching. He is particularly interested in student collaboration and effectively utilizing AI and technology in the field of education.

**Alexander Carroll** is an assistant professor at Kyoto University of Foreign Studies. He has a working background in elementary EFL. His special interests lie in early developmental learning, language acquisition, Japanese/English translation as well as how technology and AI will shape language education in the future.