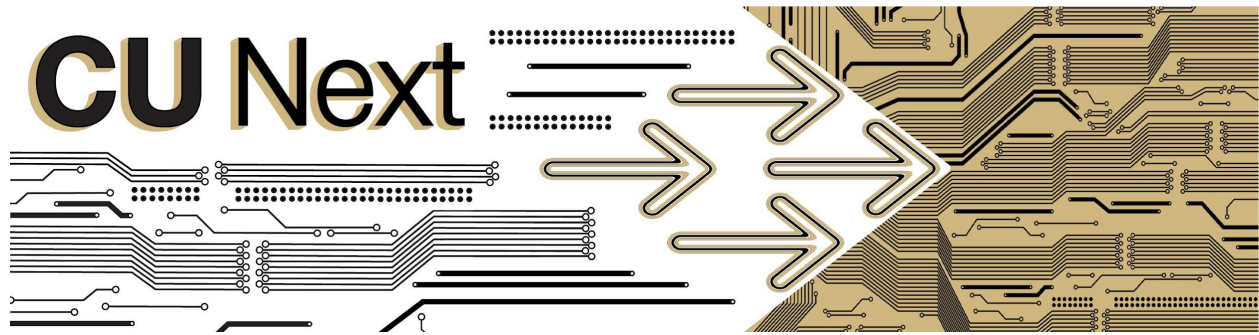


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■ What are the challenges you encountered?	
■ Did you modify your direction? If yes, in what ways?	
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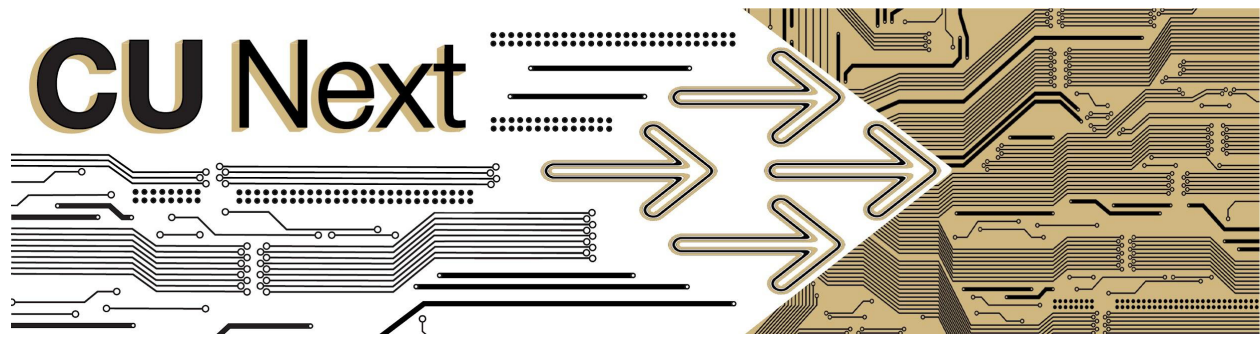
Leveraging the Learning Assistant infrastructure to disseminate technologically rich educational environments across three CU campuses



Date: December 15, 2025

PI: Laurel Hartley (CU Denver)

Co-PIs: Valerie Otero, Laurie Langdon, Betsy McIntosh (CU Boulder); David Weiss, Cerian Gibbes (UCCS); Robert Talbot (CU Denver)



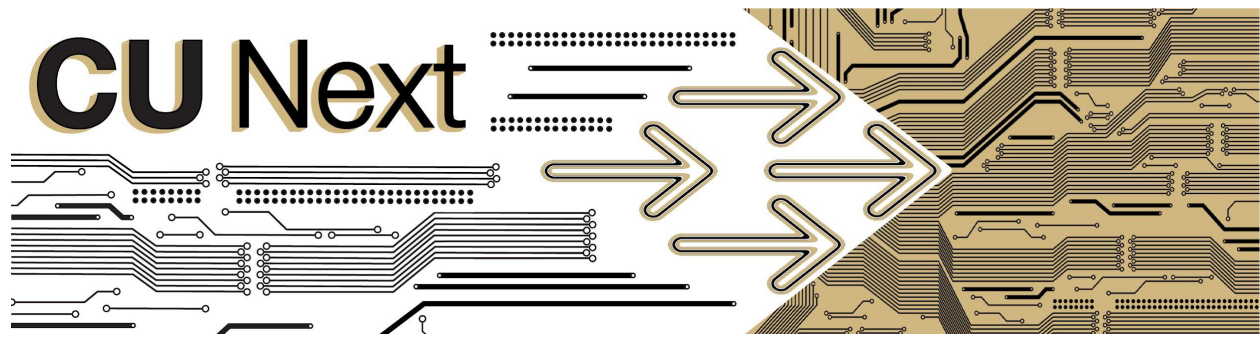
Description of the project and the goals of the project

Background: The Learning Assistant (LA) model is a widely used instructional change model that supports student-centered instruction. In the LA model, faculty enlist the help of experienced undergraduate students in large enrollment or gateway classrooms to support student-centered instruction. The LA model is distinguished from other near-peer programs by the three main pillars of the LA experience: 1) pedagogy training for Learning Assistants (LAs) in a semester long course concurrent with their LA experience, 2) weekly content preparation meetings with the lead course instructor, and 3) LAs interacting with students to promote discourse and facilitate learning. Providing pedagogy training to LAs and professional development for instructors helps the LAs and instructor to develop and implement student-centered instructional practices and helps LAs to fulfill the role of facilitator of learning. We believe that technology can greatly improve access to pedagogy training, and it can be a valuable tool in LA-supported courses. Research on the impact of LA support in STEM courses shows that employing LAs in the classroom as near-peers can increase course engagement and satisfaction, reduce DFW rates, and increase student learning.

Innovation: This CU Next project created and delivered a new online, cross-campus Teaching and Learning Course for Learning Assistants and created a cross-campus Faculty Learning Community to help LA-Faculty Teaching teams to effectively weave use of technology, conceptual learning, and social-emotional support into LA-supported courses. We accomplished this by using technology to build a diverse community that strengthened expertise across the Boulder, Denver, and Colorado Springs campuses. This effort also supported the pilot of the LA Program at UCCS.

Outcomes:

1. an innovative cross-campus Teaching and Learning course for LAs (CU-TLC) that promotes learner-centered uses of technology
2. improved success of students taking LA-supported courses
3. a new sustainable Cross-Campus LA Program Partnership (CU-LAPP)
4. a new pilot of the LA program at UCCS.



Lessons learned

Outcome 1: an innovative cross-campus Teaching and Learning course (CU-TLC) that promotes learner-centered uses of technology

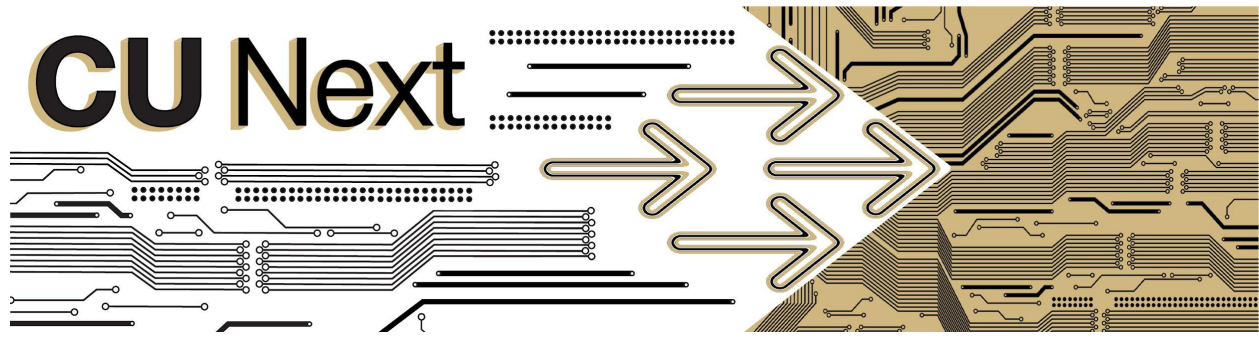
We developed a **multi-campus online undergraduate pedagogy course for Learning Assistants** and began delivering the course in Spring 2023. Over the course of the project, the course was offered 5 times and students enrolled from UCCS (12), CU Boulder (38), and CU Denver (38). There is now infrastructure in place for students to enroll in the course at another campus. This infrastructure enabled UCCS to create an initial pilot of the LA program on their campus.



Spring 2023 Inter-campus LA Poster Exhibition



CU Denver co-Director and LA at Fall 2024 Poster Session at CU Boulder



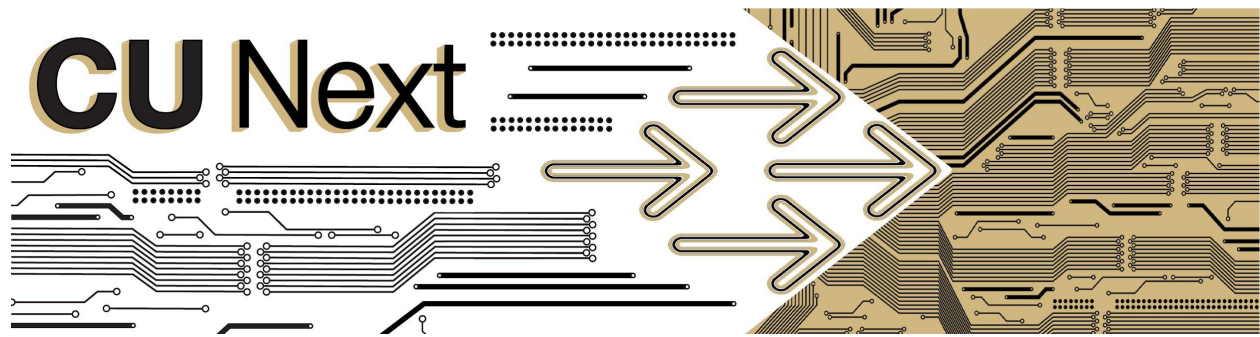
CU Denver LAs from TLC presenting at CU Boulder-hosted Spring 2025 LA Poster Session

Spring 2025 CU-TLC Community



Hi Dr. McIntosh! I just wanted to express my gratitude for teaching the LA class. I had a lot of fun during class, especially in our PODs. I think the structure of the class for me was a little out of my comfort zone- but towards the end of the semester I became a lot more comfortable with participating more. I feel like you really showed passion for teaching the course, something that not a lot of teachers have. That energy definitely rubbed off on the rest of the class! Anyways I just wanted to say thank you for always being very positive and for giving in-depth feedback on all of the assignments. I'm going to be an LA again next semester and I hope to utilize the concepts we learned throughout my LA experience.

Note from CU Denver LA enrolled in Boulder-hosted TLC section Spring 2025



Outcome 1 continued: an innovative cross-campus Teaching and Learning course (CU-TLC) that promotes learner-centered uses of technology

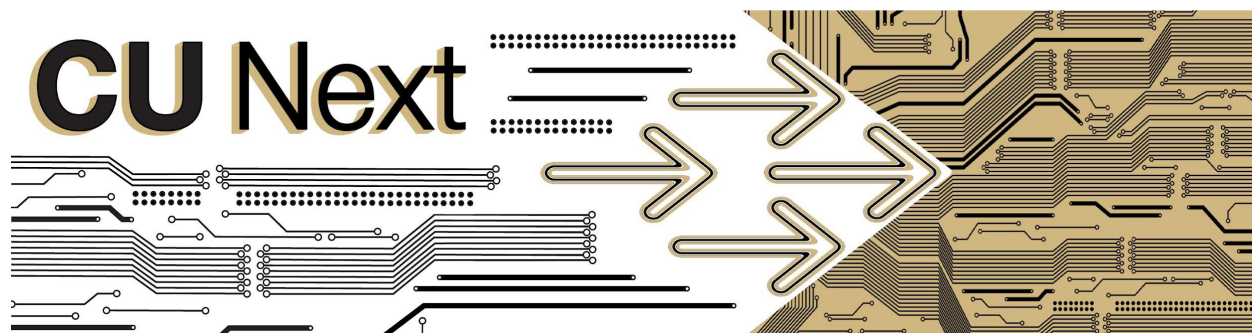
We initiated a **CU Next Faculty Community of Practice**. Faculty engaged with one another via in-person meetings, visits to each other's classrooms, virtual meetings, and an in-person retreat. The faculty discussed topics such as designing and facilitating LA-worthy activities, discourse in the classroom, nature of feedback, maximizing strength of the team model of instruction, student sense of belonging, and how faculty and LAs can use AI to improve their practice. Faculty reported that the community of practice helped them improve their own practice and build their professional network with peers teaching the same courses at other campuses. Twenty-two faculty participated in the CU Next Community of Practice. Additionally, 8 faculty chose to also attend the annual International Learning Assistant Alliance Conference (ILAC) and 3 presented posters or facilitated a session at ILAC.



CU Next Faculty Community Practice Retreat at Denver Botanic Gardens, Summer 2023

Challenges/Modifications/Evolution:

Having students from across the system enroll in one course requires adjusting the schedule of the course to accommodate different campus start dates and campus closure dates. Students also need guidance in navigating enrollment requirements on another campus because each campus is different. If the course is a formal course, students must pay tuition, which can be a barrier. The ability for UCCS Learning Assistants to enroll in the course at CU Boulder or CU Denver was instrumental in launching the pilot LA program at UCCS. UCCS has now developed their own pedagogy training program. UCCS has chosen to use a non-credit model to keep costs of training low for their students. Going forward, the cross-campus pedagogy course is less critical for program survival but will be used on an as-needed basis to increase access for LAs and provide LAs with more opportunities to interact across campuses. The



course also serves as a proof of concept for other programs that a cross-campus course can help remove hurdles for starting an LA Program.

We initially created a joint course for faculty and student Learning Assistants but separated the courses because we recognized that the two populations had different needs. Initially, faculty met twice per week for 50 minutes. In Spring 2023, we conducted formal interviews of the faculty participants and used their feedback to modify the structure of the program. We moved toward fewer sessions that were longer. The LA Faculty Community of Practice was a great success and can be sustained in a low-resource way by holding Zoom discussions each semester and continuing to support faculty attendance at the International Learning Assistant Alliance. Faculty also have expressed interest in cross-campus LA faculty one-day retreat annually.

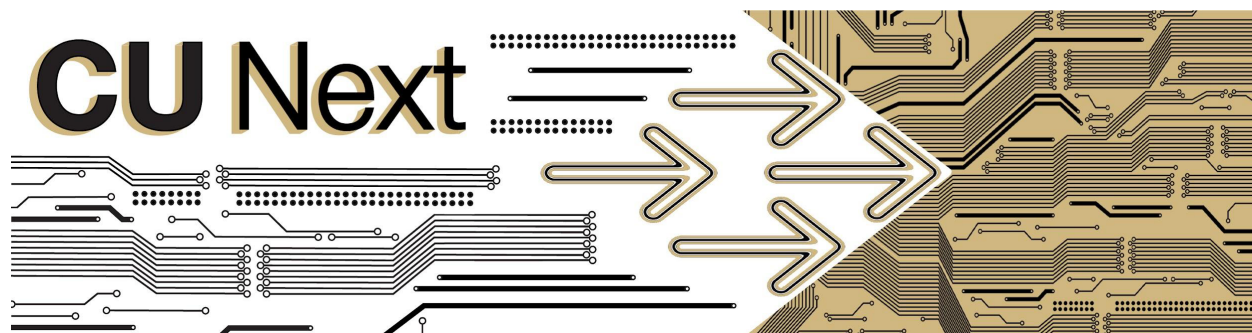
Outcome 2: Improved success of students taking LA-supported courses

We chose to focus on affective measures related to student affective engagement in Learning Assistant supported courses. We employed two surveys in the project including the SPIRES survey (Skinner et al. 2107) about student sense belonging, identity, and self-efficacy. We also administered a survey we developed about LA support which asked students how often they interacted with a Learning Assistant during class (e.g., once per week), how often they interacted with an LA outside of class such as in office hours (e.g., once per month), whether LAs influenced a student's confidence in their ability to succeed, whether LAs helped a student connect to other students, and whether LAs influenced a student's thinking about future classes or career opportunities. The survey also included one open-ended question asking the student to describe a memorable interaction with an LA. Survey reports were generated and provided to faculty in the community of practice to discuss trends and course improvement with LAs. We continue to analyze these data and are currently working to link individual student interaction with LAs to their affective measures and to their final course grade.

Because UCCS was just beginning their program, we also chose to do an in-depth analysis of Chemistry courses at UCCS that were taught with and without Learning Assistants. We examined exam grades and DFW in General Chemistry 1 and General Chemistry II.

Challenges/Modifications/Evolution:

For many courses, student response rates to surveys were low, which is a perennial challenge in gathering survey data from students. However, the large number of instructors who chose to give the survey resulted in a data set that is quite large. After initial analysis of the dataset, we



generated further questions. We believe this dataset can be leveraged to answer those additional questions and are using the dataset for further exploration.

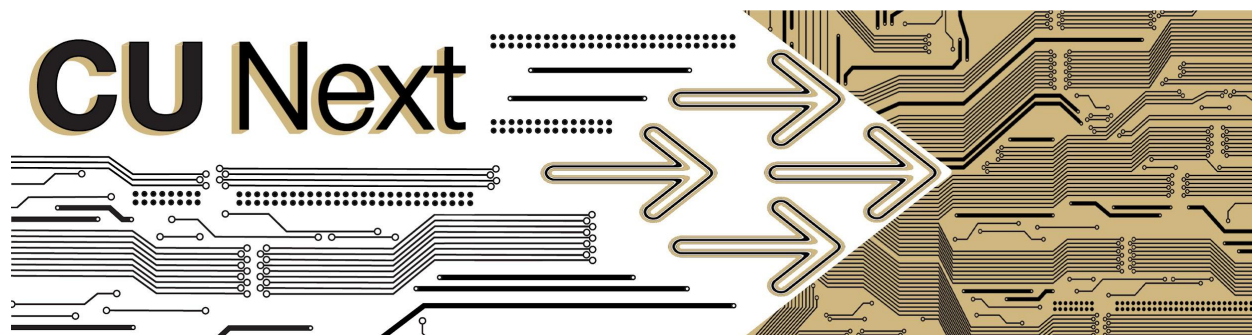
As the project evolved, we chose to integrate survey summary reports into our faculty community of practice for faculty to reflect on the trends seen in their courses. This provided faculty an opportunity to read and discuss primary literature related to affective measures of belonging, science identity and self-efficacy. During our community of practice, faculty also workshopped ideas for actions they would take to improve student belonging, science identity and self-efficacy. In the final year of the project, the faculty chose to focus on the use of AI by students for learning and by faculty and LAs for teaching. We used AI to analyze open response data from the surveys about the memorable interactions students had with their LAs.

Outcome 3: A new sustainable Cross-Campus LA Program Partnership (CU-LAPP)

We now have relationships among program directors and faculty at three CU Campuses. This new network serves to provide advice and support among programs and among LA faculty. The partnership also has resulted in collaboration on presentations, papers, and grant proposals including:

Presentations

- “Do Learning Assistants Have the Same Impact on General Chemistry 2 Students as They Do on General Chemistry 1 Students?” Kailene Black, Jake Marcotte, Aidan Burke, Joey Wagoner (Dept of Psychology), David J. Weiss and Patrick McGuire (Dept. Teaching and Learning), Spring national ACS meeting, March 2025.
- “Are learning assistants the hidden X factor in General Chemistry?” Kailene Black, Jake Marcotte, Joey Wagoner (Dept of Psychology), David J. Weiss and Patrick McGuire (Dept. Teaching and Learning), National American Chemical Society Meeting in Denver, CO, completely revised and updated poster, Fall ACS meeting, 2024, Poster presentation.
- “Can Learning Assistants Really Improve Inclusiveness and Student Performance in General Chemistry?” David J. Weiss, Kailene Black, Jake Marcotte, and Joey Wagoner, Oral presentation at national American Chemical Society Meeting, March 2024.
- “Implementation of the Learning Assistant Model in Geography Classrooms” Dr. Cerian Gibbes, Brenna Martin*, Dr. David Weiss, Dr. Robert Talbot, American Association of Geographers Annual Meeting, April 2024, Hawaii.
- “Learning Assistants at UCCS” Cerian Gibbes and David Weiss, UCCS Faculty Resource Center, April 19, 2024, UCCS.



Publications

Weiss, D.J., Wagoner, J.A., Black, K., Burke, A., Marcotte, J., Hartley, L. "Different Courses, Different Impacts: Unequal Benefits of Learning Assistants in General Chemistry I vs. II."

Submitted to the *Journal of Chemical Education*, submitted June 2025. Accepted December 2, 2025.

Proposals

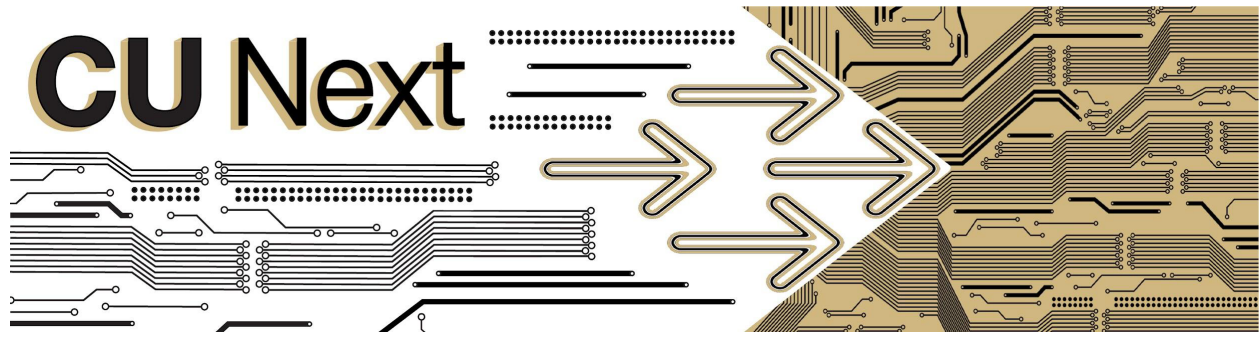
NSF IUSE Proposal (submitting in 2026) STEM Assist: AI Powered Chatbots for Undergraduate STEM Educators

Outcome 4: A new pilot of the LA program at UCCS

UCCS piloted Learning Assistants in four disciplines: Chemistry, Geography, Geology, and Philosophy. The pilot program explored the adaptability of the LA model across disciplinary contexts, instructional formats, and course levels. Feedback collected from both students and faculty indicates that the pilot was successful.

Challenges/Modifications/Evolution:

Building on prior success with Learning Assistants (LAs) in General Chemistry, the instructional support model at UCCS has evolved to incorporate embedded tutors who are base funded through existing institutional resources within the campus Excel Centers. The Excel Centers provide a source of funding and pedagogical training. These tutors now serve in multiple General Chemistry courses and function in roles like LAs by supporting active learning during lecture and facilitating student engagement, while leveraging a sustainable funding structure already embedded within the university. Unlike traditional LAs, these tutors do not enroll in a semester-long pedagogy course; instead, they receive structured pedagogical training through a Science Center-led workshop grounded in evidence-based instructional practices. We are currently investigating whether students perceive these tutors in ways comparable to Learning Assistants and evaluating their impact on course outcomes, including average course grades and DFW rates, relative to historical control sections without embedded support. By situating this model within existing teaching and learning center infrastructure rather than creating a parallel instructional support system, this work aims to demonstrate a scalable and sustainable approach that may be particularly attractive to institutions seeking to enhance student success without establishing programs perceived as duplicative or competitive.

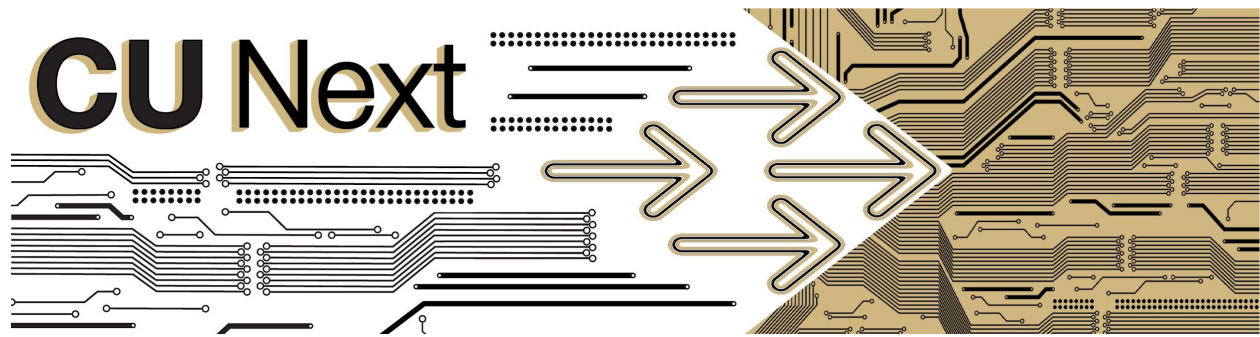


Results - Data and analysis relative to learning outcomes

The on-line Cross-Campus LA course removed the barrier of access to the LA course for 88 students during the project.

Table 1 - Students enrolled in the Learning Assistant Teaching and Learning Course

		# Students Enrolled from Each Campus		
Term	Campus Hosting Course (Instructor)	Boulder	Denver	Colorado Springs
Spring 2023	Denver (Talbot/Otero)	4	10	2
Fall 2023	Denver (Talbot)	5	9	1
Spring 2024	Boulder (McIntosh)	7	6	6
Fall 2024	Boulder (McIntosh)	7	9	3
Spring 2025	Boulder (McIntosh)	15	4	0



Interviews with LA Faculty about Faculty Community of Practice

We conducted 20-30 minute structured interviews with a sample of faculty who participated in the community of practice. We analyzed interviews for themes. These themes were used to modify the project to best meet faculty needs.

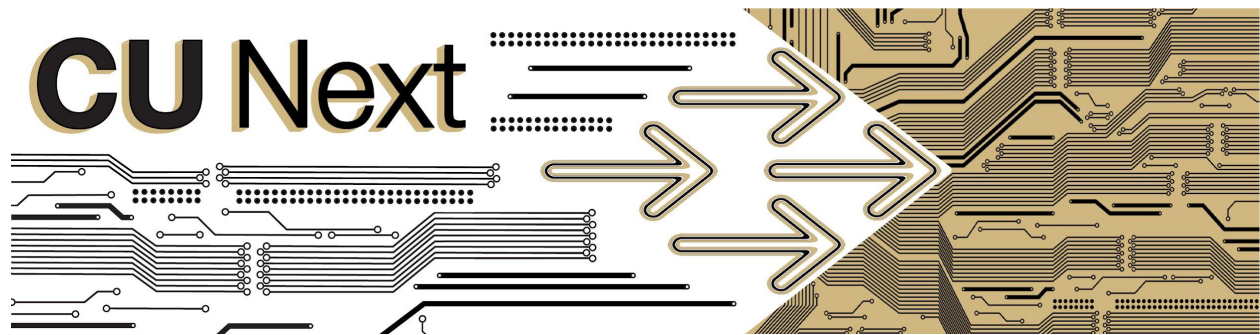
Theme 1: Everyone valued networking at a variety of levels - within their department, within their institution, and across institutions in the CU system. One value was getting to work with people with similar views about learning, who were “bought into” the student-centered Learning Assistant model. Faculty said that seeing other contexts in the system was “eye-opening”. Networking about the LA model also put faculty together who discussed other aspects of their career, resulting in general professional networking.

Theme 2: A faculty member’s prior experience working with Learning Assistants influenced how they felt about the community of practice. The participants who hadn’t yet worked with LAs said they benefited from hearing how the model was implemented by experienced faculty. They did not indicate that they were overwhelmed by the discussions. Experienced LA users got value from the community of practice and felt satisfaction when mentoring less experienced faculty. Experienced faculty occasionally said that content was review for them or that they wanted “meatier” discussion.

Theme 3: Faculty valued the opportunity to be more mindful and intentional about their teaching. They also valued “getting into” readings and theory behind them. Faculty said they “wouldn’t have found time to dig into these topics” if not for CU-Next Community of Practice.

Theme 4: Faculty never feel like they have enough time for professional development. The stipend helped them prioritize the community of practice in their busy schedules. Faculty liked the structure of a community of practice and accountability. They liked having some reading or artifacts to discuss, but did not have time to do extensive preparation and they wanted leeway to get into authentic, “organic” conversations.

Theme 5: Faculty cited that feedback, eliciting student ideas, active learning, and compassion were the top valued topics. Note that we conducted the interviews before we focused on AI as a discussion topic. One faculty member gave unsolicited feedback about the AI topic. They appreciated that the discussion of AI in the CU Next Community took an “asset” approach and discussed how AI could be used productively and ethically in teaching and learning. This was



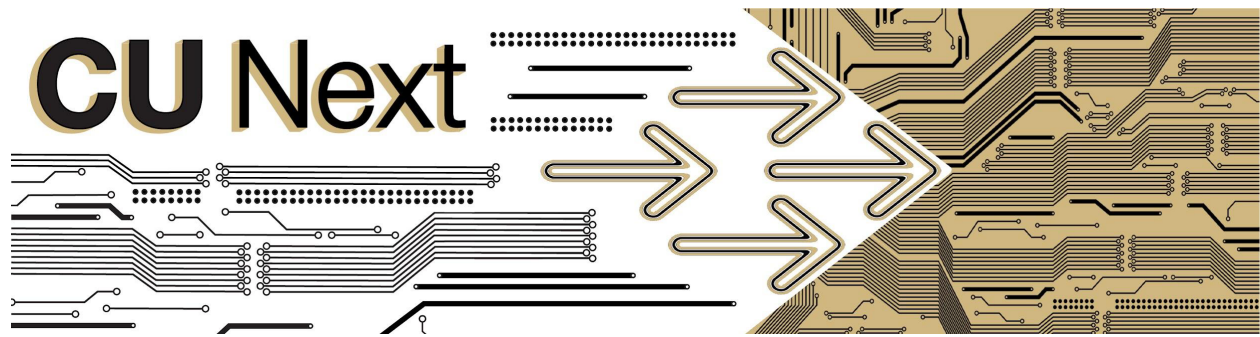
in contrast to his previous experiences discussing AI, which used a “deficit” or punitive/restrictive lens to view AI in higher education.

Exemplar Faculty Quotes

“Really nice to connect with people from other campuses. I don’t know what happens at the other campuses. It has opened my eyes to the resources they have and what I do have.”- Chemistry, CU Boulder

“I got value from connecting with faculty on other campuses. The cross-campus connection is particularly important when you come from a small campus. It helped that we are the same system.; Even though remote, felt like I could connect with the people in my smaller group. Especially in the small group.” - Geography, UCCS

”I did implement it. Because it was on the front of my mind, I used it immediately in class. Also, the butterfly video - it stuck with me, and it was an easy example to share in class. It is very visual.” - Geography UCCS



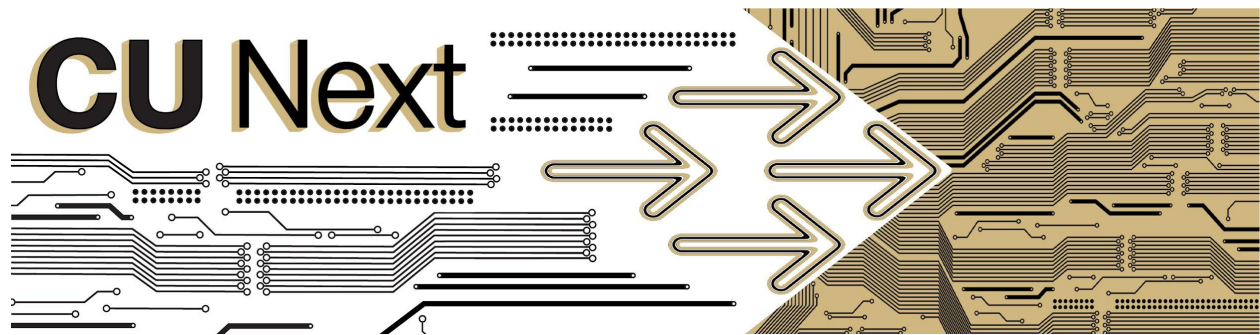
Feedback Specifically from UCCS Faculty and Learning Assistants in the Pilot Program

Faculty reported that Learning Assistants played a critical role in facilitating active learning during class sessions, particularly by supporting small-group discussions, guiding problem-solving activities, and helping students articulate their thinking. As supported by the example feedback below, LAs acted as an important bridge between instructors and students and allowed faculty to redistribute time and provide additional instruction for students who needed additional support.

“As a teaching professor at UCCS, I have been fortunate to have a Learning Assistant in two of my classes (Historical Geology in Spring 2025 and Physical Geology in Fall 2025). In both classes, I have seen clear benefits for the students, the learning assistant, and myself. The learning assistants develop skills in clearly and concisely communicating science, hone their knowledge of geologic processes, and build community with other students enrolled in the geology minor. Students greatly benefit from the peer-to-peer mentorship that occurs when a learning assistant is in the classroom. Personally, having a learning assistant has helped reduce the time spent setting up class material. It has also allowed me to spend additional time with students who may be struggling more with the course content during lab. Additionally, I have noticed higher midterm and final exam scores, as well as higher FCQ review ratings, in courses with an LA in class vs. those without. Overall, I cannot speak more highly of this program.”

- Dr. Jen McLeod, Assistant Teaching Professor, Geology, UCCS.

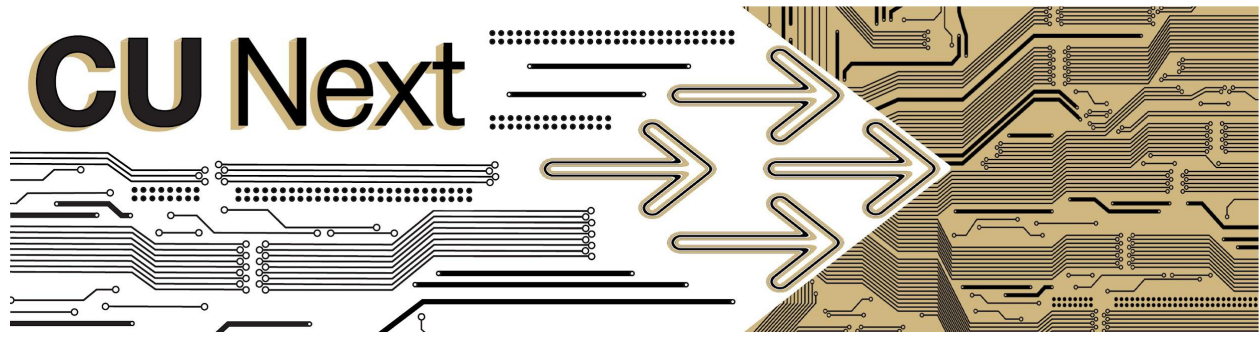
Students noted that the presence of LAs made courses feel more approachable, supportive, and less intimidating. Because LAs draw on their own experience as former students in the course while also understanding instructional goals, they were able to act as accessible and trusted points of contact for students navigating unfamiliar or challenging material. The peer-to-peer nature of the LA role helped normalize confusion as a natural part of the learning process and lower barriers to asking questions, particularly in courses with complex technical or quantitative content. As highlighted in the quote below, LA-facilitated office hours evolved into community-oriented spaces focused on listening, encouragement, and shared problem-solving rather than directive instruction. LAs also played a key role in fostering a sense of



belonging by encouraging students to support one another, facilitating connections among peers, and helping create a collaborative classroom culture in which students felt seen and valued, as reflected in students explicitly acknowledging the class community in their final projects.

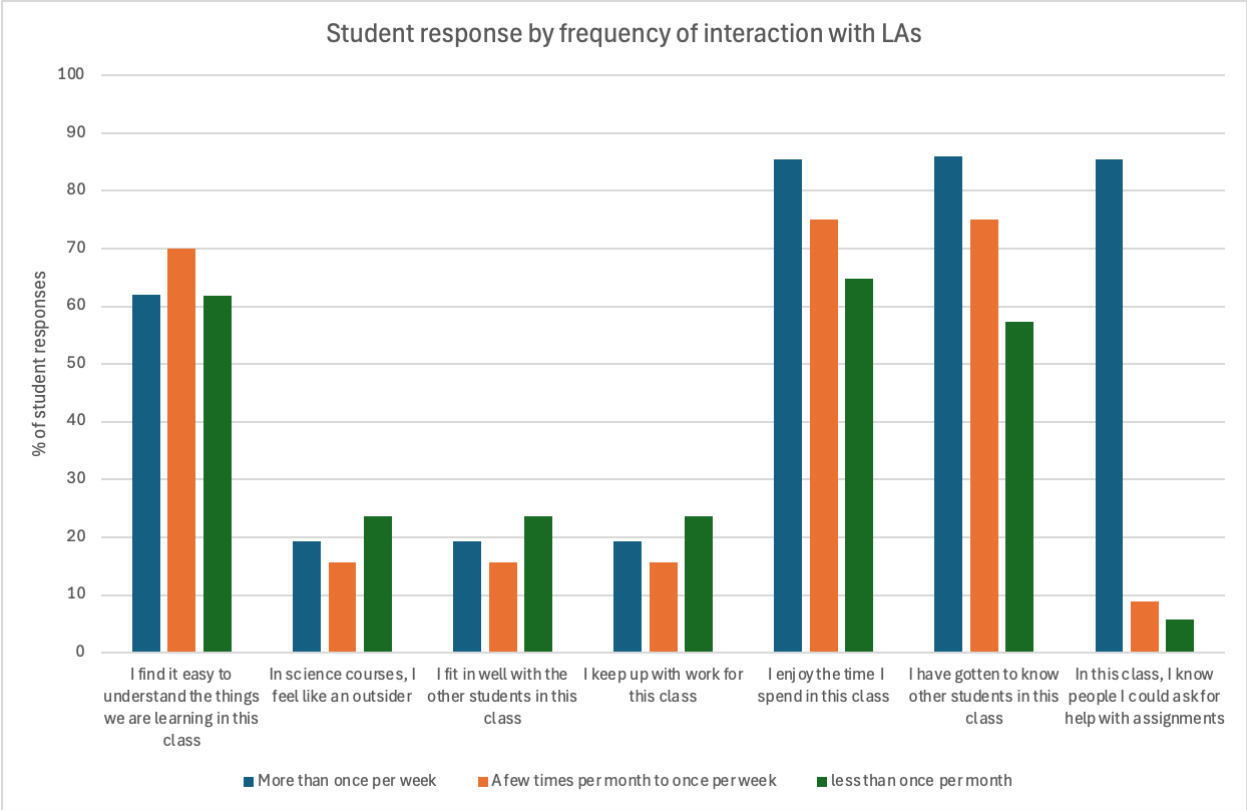
“Being an LA means approaching a course in a unique perspective. I have both the experience of being a student in that course and the knowledge of what is being planned. LAs have the role of acting as a friendly face in a world of unknown and often scary content. We serve as one of the first resources for a student through the idea of being accessible; students have a different kind of relationship with LAs than with professors. Being closer in age and in experience to students means that LAs have an opportunity to provide support through both course knowledge and providing a listening ear.” - LA fall 2023, Geography, UCCS.

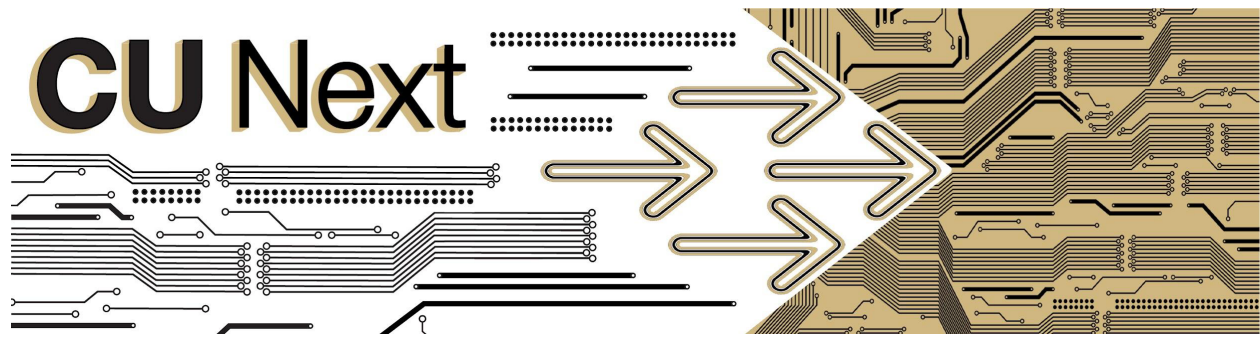
“[LA] office hours became community hours where I was not guiding the hour but instead offering support and answering questions. Learning Assistants are vital to building belonging within a classroom. Not only are the LA to student relationships vital, but I often encouraged students to move around the room and talk to someone I knew could answer their question. One student’s final project even included the class in the acknowledgements.” - LA spring 2024, Geography, UCCS.



Relationship of student affective measures with frequency of interaction with LAs

We obtained over 1000 student survey responses in over 12 courses and examined the relationship between frequency of interaction with Learning Assistants and affective measures of student engagement and belonging. Students who interacted with LAs most frequently reported more enjoyment of class time, knowing other students and class, and feeling like they knew how to ask for help in class. Other survey questions related to student self-efficacy and science identity showed no relationship with frequency of interaction with LAs. We will be further analyzing this data set to answer emergent questions.

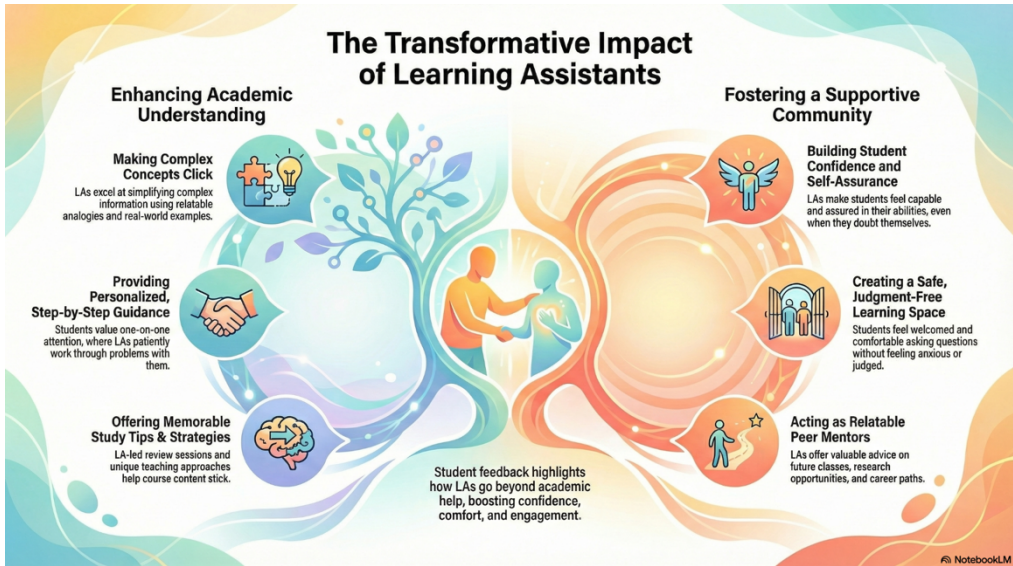




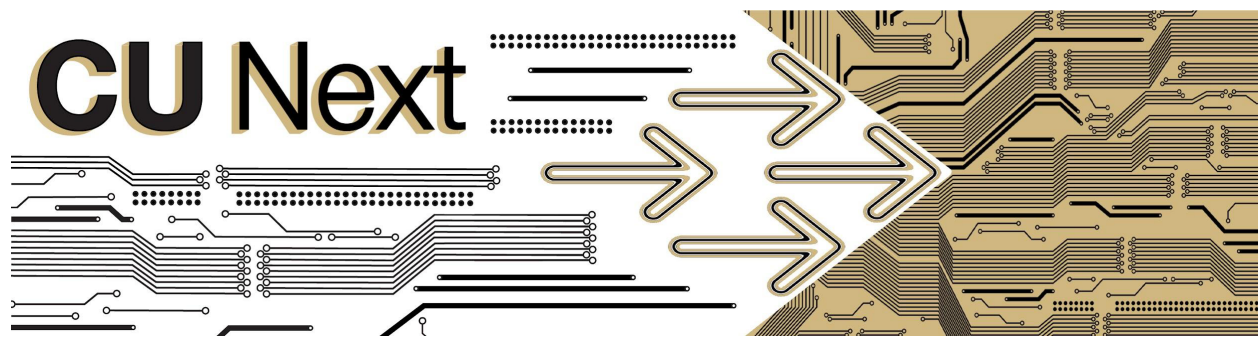
Memorable Interactions with LAs

We asked students to describe a memorable interaction with Learning Assistants in their course. As part of our discussion about the utility of AI in optimizing teaching with Learning Assistants, we used Notebook LM to synthesize major themes in the over 500 student responses.

The analysis reveals that LAs play a critical, multifaceted role that extends far beyond simple academic support. The most impactful interactions are characterized by a



combination of effective instructional techniques, significant emotional and psychological support, and personalized mentorship. Students frequently praised LAs for their ability to simplify complex topics, build confidence, reduce academic anxiety, and create a non-judgmental learning environment. The peer-to-peer nature of the LA role is a consistent theme, with students valuing the relatability, shared experiences, and approachability of LAs. However, a substantial portion of responses indicates a complete lack of memorable interactions. This is attributed to various factors, including students' personal shyness, the limitations of online course formats, and in some cases, a lack of awareness that LAs were available. While overwhelmingly positive, the feedback also includes a small number of negative experiences where interactions led to discomfort or feelings of being misunderstood. Overall, the data underscores the profound positive influence that dedicated LAs can have on student success and well-being, while also highlighting opportunities to improve the reach and consistency of the LA program.



I. The Multifaceted Role of Learning Assistants

Student responses illustrate that LAs provide support across three primary domains: direct instructional aid, emotional and confidence-building encouragement, and valuable mentorship.

A. Core Instructional and Academic Support

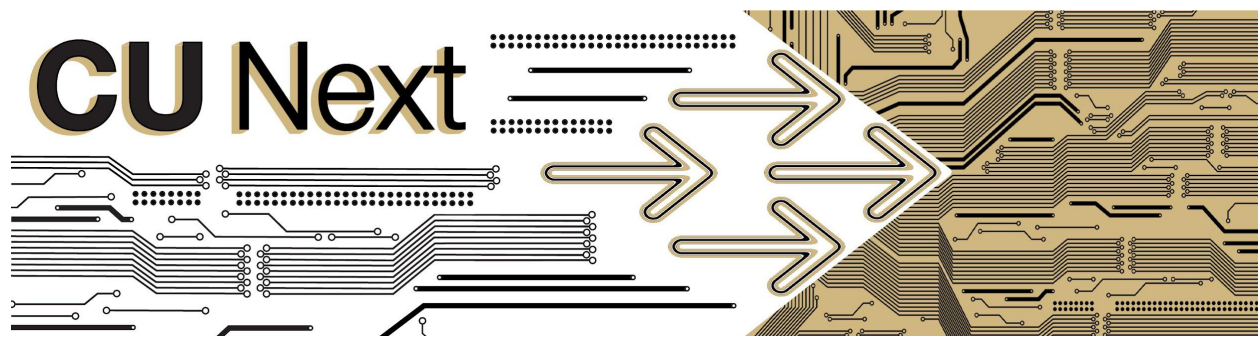
The most frequently cited function of LAs is their direct contribution to students' academic understanding. They employ a variety of effective pedagogical techniques to clarify difficult material.

- **Simplifying Complex Concepts:** LAs are consistently praised for their ability to "simplify such complex and tedious information to simple and fun." Students value when LAs explain concepts "in simpler terms" or in a "different way that was much easier to understand."
- **Utilizing Relatable Analogies:** The use of real-life examples and analogies is a highly effective tool. One student remembered an LA explaining autoinducers by comparing it to "making sure she had all her friends to fight someone they didn't like since she wouldn't go on her own!!" Another noted, "Brady relates concepts to real life things that crack me up but really help me remember them."
- **Guided Problem-Solving:** Students appreciate a pedagogical approach that fosters independent thinking. A memorable interaction was when an LA "didn't give us the answer but helped us achieve it." Another student valued how an LA "forced me to fully think it through myself with some of their guidance."
- **Targeted Assistance:** LAs provide crucial help with specific course components, including:
 - Homework and in-class activities
 - Quiz and midterm corrections
 - Review sessions, such as "explanation stations before our quizzes"
 - Navigating course software like ALEKS
 - Providing detailed feedback on assignments to ensure full points

B. Emotional and Psychological Impact

Beyond academic help, LAs have a profound effect on students' confidence, comfort, and motivation. Many responses focused on the affective dimension of their interactions.

- **Building Confidence:** A recurring theme is the role LAs play in boosting student self-assurance. Representative comments include: "Aries has always been an amazing LA for me because they help me to feel more confident and assured in my abilities, even when I doubt myself," and "Every time I interacted with Aries, they made me feel more confident in my abilities."
- **Creating a Safe and Welcoming Environment:** LAs foster an atmosphere where students feel comfortable asking questions without fear of judgment. Students noted, "it never felt like they were treating us like we were dumb or not smart," and praised LAs for their ability to help "without making me feel stupid for not understanding." This



welcoming attitude encourages students to seek help when they need it.

- **Reducing Stress and Anxiety:** LAs' calm and patient demeanor helps alleviate academic pressure. One student, after "stressing and doubting myself," recalled an LA who "came up, sat through a question of the assignment with me, made a joke to ease up a bit, and then helped me connect the concept to the answer."
- **Personal Recognition and Connection:** Students feel valued when LAs make an effort to know them personally. One student appreciated that an LA "took the time to get to know me as a person," which made them feel like "an actual person too," not "just another 'student'."

C. Mentorship and Extracurricular Guidance

Several students described interactions where LAs served as mentors, providing guidance beyond the immediate scope of the course.

- **Academic and Career Advising:** LAs offer valuable advice on future coursework and career paths. Students received tips on "which class to take," "how to study for being a first-generation student," and information about PA school. One student noted, "All of the LA's were incredibly supportive and caring. One LA even took the time to help me rearrange my class schedule for next semester since we have the same major."
- **Connecting Students to Opportunities:** LAs have facilitated student involvement in the university community. For example, one LA "helped me become a dissection officer for a biology club," while another "helped me volunteer with the biology club." Others shared their own experiences with research opportunities and internships.
- **Inspiring Future LAs:** Positive interactions have directly motivated students to pursue the LA role themselves. One student stated an LA "really encouraged me to apply to be an LA and that influenced my motivation to do so," while another explicitly said an LA "Helped me decide to become an LA next semester."

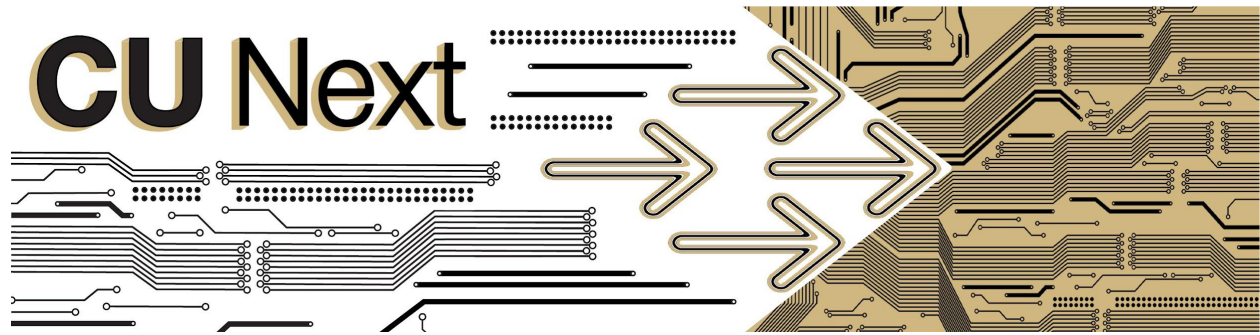
II. Barriers to Interaction and Negative Experiences

While the majority of detailed responses were positive, a significant number of students reported no memorable interactions, and a few detailed negative encounters.

A. Lack of Interaction

A large volume of responses consisted of "None," "N/A," "n/a," or similar statements indicating no memorable interaction occurred. The reasons provided by students include:

- **Student Shyness:** Several students attributed the lack of interaction to their own personality, stating they were held back by "shyness and a bit of introversion in myself."
- **Online Course Format:** Students in online classes reported limited engagement with LAs. One wrote, "I was online, so I really only interacted with the instructor."
- **Unawareness:** Some students were not aware of the LAs' existence or role, with one stating, "I have never met an LA since I have attended this university" and another admitting, "Literally didn't know there was one."
- **Scheduling Conflicts:** Commuter students or those with work schedules noted difficulty attending office hours or homework groups where interactions might occur.
- **Self-Sufficiency:** Some students felt they did not require assistance, relying instead on

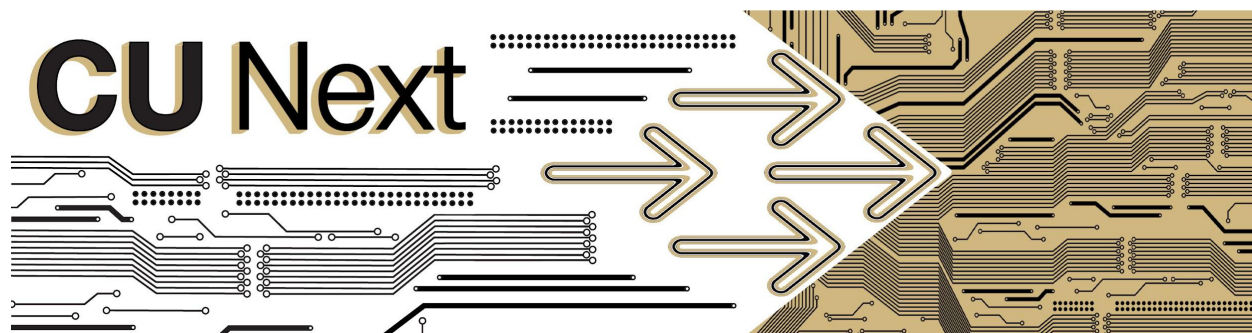


peers or their own understanding.

B. Negative Encounters

A small minority of students reported negative experiences that created an uncomfortable learning environment or left them feeling misunderstood.

- **Creation of an Uncomfortable Environment:** One student explicitly stated, "I did not enjoy my time with the LA's as one of them created an uncomfortable learning environment for me and other fellow classmates."
- **Feeling Judged or Misunderstood:** Another student described feeling that an LA misinterpreted a higher-level question as "a way too simple/stupid question," which "felt really weird and a little upsetting."



Deep Analysis of Comparison of General Chemistry I and II taught with and Without Learning Assistants at UCCS

Results show that LAs significantly improved GPA and reduced DFW rates in General Chemistry I, but had limited effect in General Chemistry II, where students were more academically prepared. While LA-supported students reported higher belonging than non-LA supported students, only self-efficacy significantly predicted course GPA. A layered support model—combining LAs with Science Center tutoring—produced the greatest gains for at-risk students in first year gateway courses. These findings indicate that LAs are most effective in first-semester, high-DFW contexts, and that building students' self-efficacy may be central to improving academic performance and persistence in undergraduate STEM pathways.

Table - Frequency of Course Grades (ABC), DFW, and DF Across Learning Assistant and Non-Learning Assistant Courses in General Chemistry I and II. ABC = students earning A, B or C, DFW = students earning a D or F or withdrawing from the course

Course	LA Status	ABC, n (%)	DFW, n (%)	DF, n (%)	Total
Gen. Chem I	LA section	125 (85.0%)	22 (15.0%)	10 (7.5%)	147
	No LA	56 (73.7%)	20 (26.3%)	13 (18.8%)	76
Gen. Chem II	LA section	114 (92.7%)	9 (7.3%)	6 (5.0%)	123
	No LA	69 (90.8%)	7 (9.2%)	6 (7.9%)	76

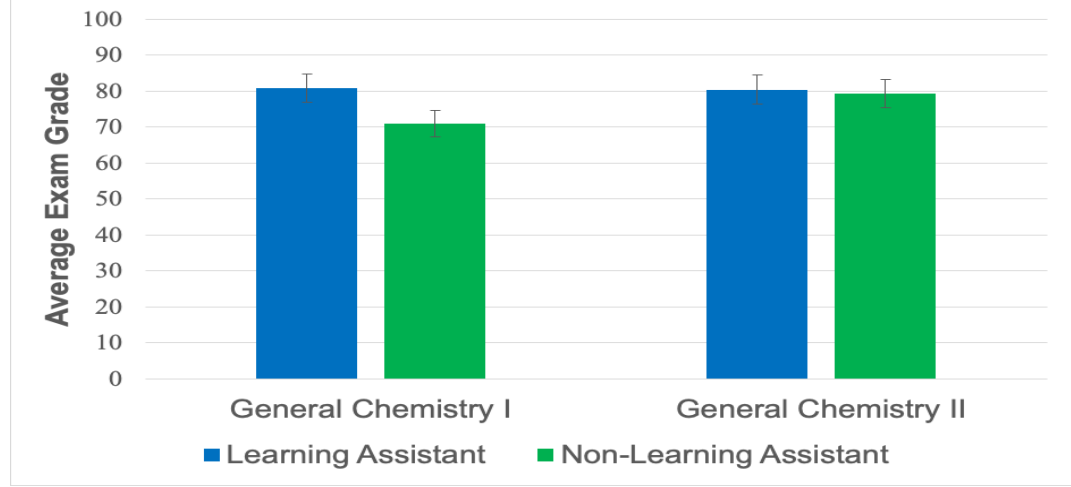
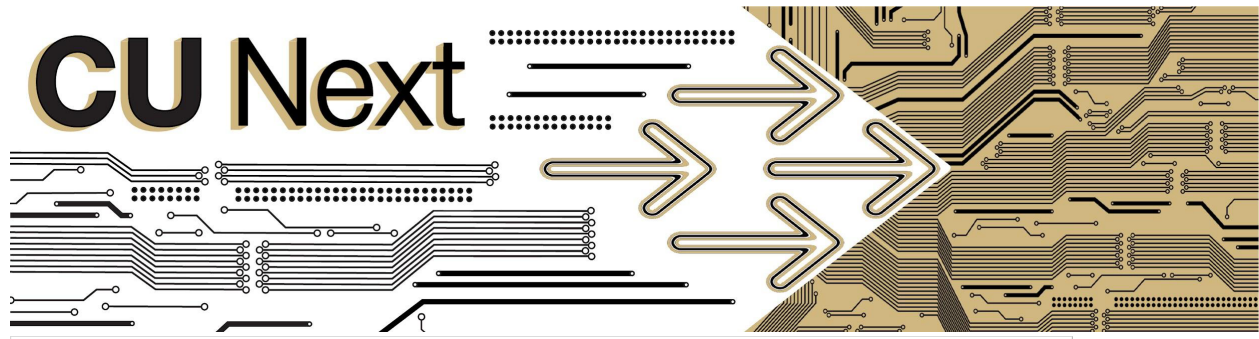
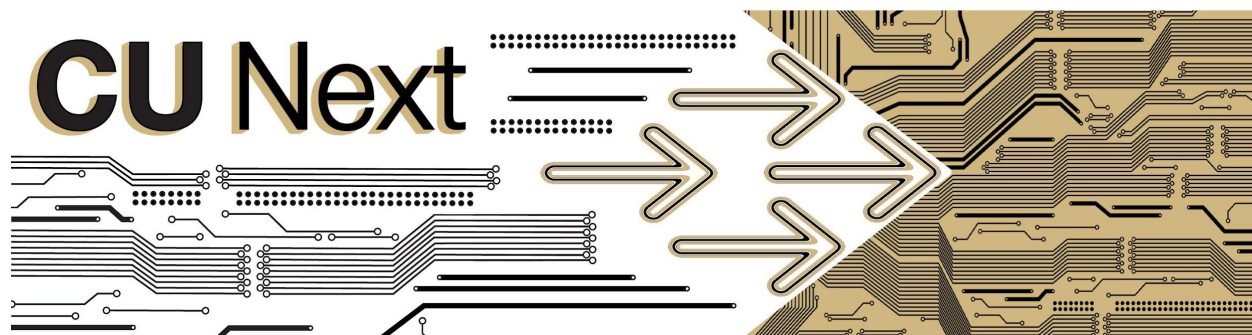


Figure - Average Exam Scores Across Chemistry I and II Courses with and without Learning Assistants



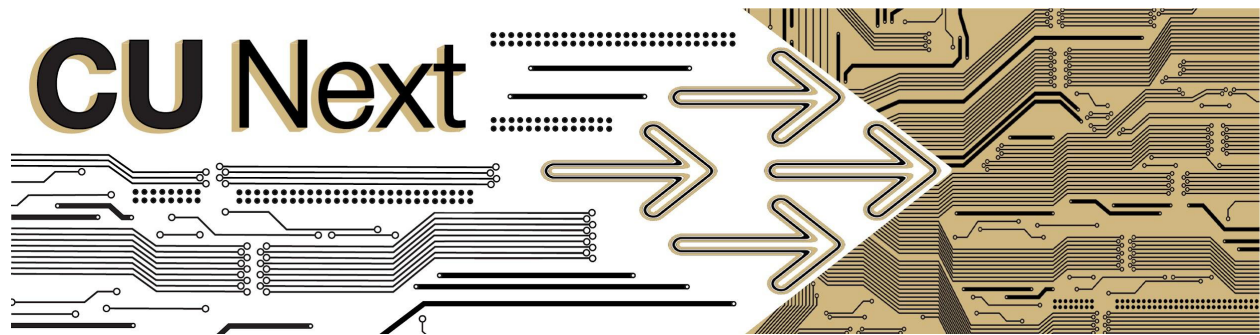
Overall conclusions, recommendations, and outcomes

Conclusions

- Training in pedagogy for Learning Assistants is one of the three pillars of the LA model, but the availability of a pedagogy course is a barrier for universities to initiate LA programs. We found that enrolling students in an on-line pedagogy course at another institution can remove this barrier and thus facilitate pilot LA Programs. However, cross-institution enrollment, even within the CU System was administratively cumbersome.
- Learning Assistant faculty benefit from participating in communities where they can interact with other faculty who have similar epistemological beliefs about learning. Faculty indicated that they benefit from both cross campus and cross disciplinary groups. We experimented with multiple modalities of interaction and found that faculty appreciate substantive discussions that have a theme/structure, but faculty do not have time for a great deal of advance preparation before meetings. Faculty also appreciate a structure that allows them to create plans for how they will intentionally implement small, mindful changes to their teaching practices.
- Data from UCCS that compared LA and non-LA supported Chemistry courses indicate that LA support may be most impactful in first-semester courses in a two-semester sequence of courses. This merits further exploration in more courses and university contexts.
- We found that students who interacted most frequently with Learning Assistants during course time more often reported more enjoyment of class time, knowing other students and class, and feeling like they knew how to ask for help in class. Frequency of interaction with LAs did not seem to be related to other metrics of students' feelings about their ability to learn and their science identity. This merits further exploration, which we are currently doing.

Recommendations

- Students benefit from cross-campus enrollment in courses, and technology (e.g., Zoom, Canvas) makes it possible. Making cross-campus enrollment administratively less burdensome for students could maximize cross-campus enrollment. Studying how cross-campus enrollment could impact transfer of students among campuses, degree

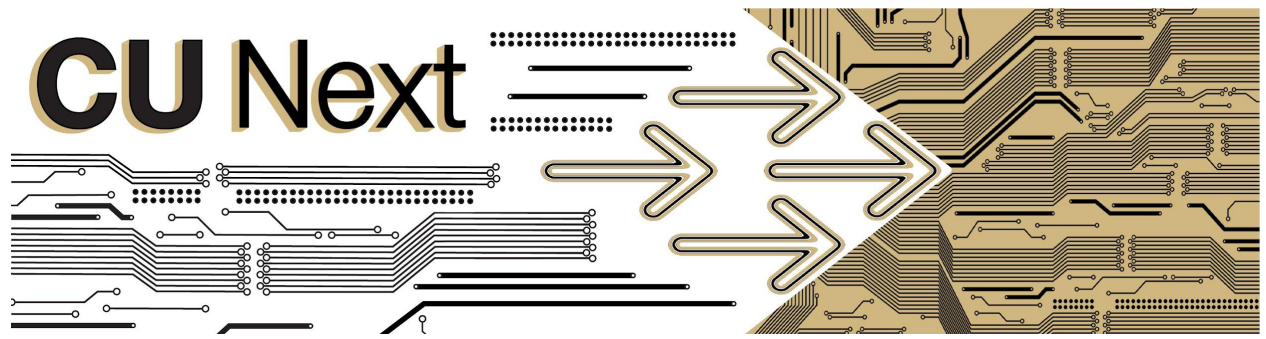


attainment, certificate attainment, and student satisfaction is a recommendation we have.

- Learning Assistants impact student pass rates in a positive way. We recommend prioritizing Learning Assistant supported sections of introductory and gateway courses as our evidence shows this will be particularly impactful to student retention and belonging.
- Faculty participants in the CU Next community of practice would like to sustain the community through Zoom meetings and one-day retreat each year.
- Discussions about use of artificial intelligence by faculty, LAs, and students were highly beneficial to our CU Next participants. All these groups want additional exploration of AI. They particularly want to view AI as a tool to do better and more efficient work. Students and LAs want guidance on how to use AI in ways that don't compromise their learning or the specialness of being human. They have a strong sense of ethical use. They also worry about environmental impact. The faculty especially appreciated framing AI through an asset lens as opposed to lens of fear or student deficit.

Summary of Outcomes

- We created a structure for Learning Assistants from one campus to enroll in the Learning Assistant Teaching and Learning course at another campus, which reduces barriers for students to be Learning Assistants and allows students exposure to other campuses and diverse students.
- We created a system-level community of practice for LA faculty which resulted in greater networking of faculty across campus. Faculty would like to continue learning about the LA model and continue their relationships across campuses.
- We created a network of LA program administrators and faculty that is resulting in papers and proposals. This network can help solve common problems and create efficiencies within the programs on each campus.
- UCCS did a successful pilot of the LA Model and have found ways to sustain near-peer instructional support on their campus.



Appendices

None