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Building a Grassroots Learning Assistant Program

Abstract

Learning Assistants (LAs) are undergraduates who work in active-learning classrooms with students facilitating discussions and encouraging deeper thinking, while also receiving pedagogical training. We describe how we built an LA program at a regional comprehensive university starting as a grassroots STEM initiative to recruit teachers, and expanding into a campus-wide multi-disciplinary program focusing on student success in a variety of general education courses. Additionally, in the 2020-2021 academic year, we conducted a formative assessment to further understand the program's impact. Our findings revealed strong alignment among students, faculty, and LAs regarding the LA's role in student learning. Qualitative themes from student surveys and faculty expectations resonated with LAs' weekly field note reflections. One surprising discovery was the consensus that LAs provided substantial support beyond the classroom. This suggests that LAs play a multifaceted role in enhancing student success, extending their influence beyond facilitating in-class discussions.

Keywords

Learning Assistants, Peer-Led Team Learning, Active Learning, Mentoring, Student Success, Qualitative Research, Alignment

Building a Grassroots Learning Assistant Program

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Learning Assistants (LAs) are undergraduates who work in active-learning classrooms with students facilitating discussions and encouraging deeper thinking, while also receiving pedagogical training. We describe how we built an LA program at a regional comprehensive university starting as a grassroots STEM initiative to recruit teachers, and expanding into a campus-wide multi-disciplinary program focusing on student success in a variety of general education courses. Additionally, in the 2020-2021 academic year, we conducted a formative assessment to further understand the program's impact. Our findings revealed strong alignment among students, faculty, and LAs regarding the LA's role in student learning. Qualitative themes from student surveys and faculty expectations resonated with LAs' weekly field note reflections. One surprising discovery was the consensus that LAs provided substantial support beyond the classroom. This suggests that LAs play a multifaceted role in enhancing student success, extending their influence beyond facilitating in-class discussions.

INTRODUCTION

Learning Assistant programs are being implemented at higher education institutions across the country for a variety of reasons including improving student engagement in introductory science courses (Campbell, Malcos, & Bortiatynski, 2019), faculty development in course design (McHenry, Martin, Castaldo, & Ziegenfuss, 2010), and to address the national challenges in science and math education (Otero, Finkelstein, McCray, & Pollock, 2006).

Learning Assistants (LAs) are undergraduate students who, through enrollment in a pedagogy course and the guidance of weekly preparation sessions with a faculty partner, facilitate discussions among groups of students in a variety of classroom settings that encourage active engagement (Learning Assistant Alliance Resources, 2012-2023). They work closely with faculty to provide a student-centered learning environment based on evidence-based practices (Barrasso & Spilios, 2021). LA programs originally started in astronomy and physics at the University of Colorado – Boulder in 2003. The programming has grown into a Learning Assistant Alliance that now supports faculty at over 500 institutions and over 100 LA programs mainly across the United States.

LA Programs have four main goals that vary in degree depending on the individual program: 1) curriculum and course transformation that supports the shift to an active learning environment, 2) discipline-based education research (DBER) that supports conversations around creating effective learning spaces, 3) institutional change by providing infrastructure that can act as a change agent for instructional practices for faculty, departments, and institutions, and 4) teacher recruitment and preparation by providing a teaching opportunity for an undergraduate who may have never considered teaching as a career (Learning Assistant Alliance Resources, 2012-2023).

The Learning Assistant program at Florida Gulf Coast University (FGCU) began with the main objective of teacher recruitment and preparation at its forefront, but over the past seven years has evolved into one of supporting course transformation and leading institutional change to address high DFW rates in General Education courses across the university.

Teacher Recruitment

This LA program was initiated as part of a Track 1 Noyce grant, which offers scholarships to STEM majors who agree to obtain teacher certification and become secondary teachers in a STEM discipline (Robert Noyce Teacher Scholarship Program, 2023). Six of sixteen Noyce scholars participated in the initial LA program. The program assisted them with developing pedagogical skills to actively engage students in their future classrooms. In 2016, Gray, Webb, and Otero showed that former LAs who became K-12 teachers were likely to score significantly higher on the Reformed Teaching Observation Protocol, indicating that they were using more active learning when teaching (Gray, Webb, & Otero, 2016). This is one reason Noyce grants represent more than 50% of NSF-supported LA programs which are approximately 20% of all LA programs (Learning Assistant Alliance Resources, 2012-2023).

Course Transformation and Institutional Change

In 2017, Sellami, Shaked, Laski, Eagan, and Sanders showed that implementing Learning Assistants with active learning had a larger effect on student learning than active learning alone, especially regarding higher-order cognitive skills and supporting under-represented minority students (Sellami, Shaked, Laski, Eagan, & Sanders, 2017). Learning Assistant programs have further been shown to lower DFW rates (Alzen, Langdon, & Otero, 2018) and increase first-year retention (Loes, An, Saichaie, & Pascarella, 2017), both of which were of interest to our university. At the conclusion of the Noyce grant support for the LA program, there was interest at FGCU in continuing it to enhance student learning, specifically in high DFW courses.

To contribute to the broader literature outlining the effectiveness of LA programming, here we a) identify two factors that contributed to the successful initiation of the program, b) describe our implementation and organization of the core aspects of an LA program, c) outline the challenges encountered as we grew the program to serve the broader university, and d) reflect on the ways LAs are used in the classroom and how their use might affect student learning. To formatively assess the LA program following full implementation, we sought to examine the perceived role that LAs play in the classroom through the lens of the students,

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the faculty partner, and the LAs themselves. This was done to ensure that the role of an LA aligned among the three groups. The results of this analysis are discussed in the context of the LA program during the period of the assessment and the program's current state.

INITIATING AN LA PROGRAM

Two factors contributed to our successful initiation of a Learning Assistant program: 1) a cohort of faculty trained in evidence-based, active learning strategies, and 2) a large number of active learning classrooms (ALCs) on campus.

Trained Faculty

FGCU was prepared to initiate this program because a substantial number of faculty had already been trained in evidence-based teaching practices, with at least one-third of STEM faculty having participated in workshops that emphasize a variety of active learning approaches. Faculty participating in other forms of professional development for teaching are also good candidates for recruitment into the LA program.

Since 2011, FGCU's Center for Faculty Development has been offering a Course Design Academy where faculty explore learner-centered design principles and use backward design and evidence-based principles to improve a particular course and its syllabus. In the last decade and accounting for repeat participation and attrition, roughly one-third (between 150-200) of the faculty have participated in this professional development.

Between 2014 and 2019, 51 FGCU STEM faculty participated in a year-long STEM professional development program offered by the STEM Education Center that emphasized evidence-based STEM teaching practices including approaches such as Process Oriented Guided Inquiry Learning (POGIL), Team-Based Learning, Project Based Learning, Problem Based Learning, and a deeper understanding of the Science of Learning from the lens of cognitive science. Faculty were also introduced to the Scholarship of Teaching and Learning (Frost, 2018). As a result, POGIL (About the POGIL Project, 2023) and Problem Based Learning have been implemented in various STEM disciplines including Chemistry, Mathematics, and Computer Science. Of these 51 faculty, 36 are still employed at the university as of this writing.

Active Learning Classrooms

FGCU has 16 active learning classrooms (ALCs) on campus which lend themselves to student-centered learning, ideal for teaching with LAs. While active learning through evidence-based teaching practices like those described above can take place effectively in auditorium-style classrooms with fixed seating, student attitudes and learning improve when the space is designed to support the active method being implemented (Espey 2017, Lasry, 2014).

Our 16 active learning classrooms can accommodate over 1,000 students during any classroom teaching session. We define Active Learning Classrooms as per Talbert and Mor-Avi where the room consists of tables, projection in two directions, and the capability to have technology at the tables (Talbert & Mor-Avi, 2019). Such a classroom fosters a learner-centered collaborative learning environment supported through technology. Active learning can also be more easily facilitated in rooms with tables instead of fixed, individual seating structures and several classrooms on our campus have this feature.

These two factors allowed us to pilot the Learning Assistant program with some assurance that we could identify faculty that could effectively use a Learning Assistant to enhance their classroom teaching.

IMPLEMENTING AND ORGANIZING CORE ASPECTS

Three core aspects of building a grassroots LA program include organizational structure, student and faculty recruitment, and LA pedagogy course implementation. Choices depend on the overall program goals and funding. Program goals often include some combination of those mentioned previously: course transformation that includes improving student success, retention, course pass rates, and supporting faculty using or learning to use active learning methods; DBER focused on learning spaces; teacher recruitment; and institutional change. We were not engaged in DBER discussions around creating effective learning spaces because as noted above, FGCU has several effective spaces for active learning. While it is possible to start an LA program with little to no funding, faculty and administrative support are absolutely necessary. In this section, we'll describe three core aspects of our LA program: how we structured the LA program across several departments (and two colleges), recruited the initial cohorts of students and faculty, and implemented the pedagogy training course that all new LAs are required to take.

Structure of the LA Program

Our LA program began as an extension of existing programs that were taking place at the STEM departmental level. The LA program appealed to faculty who were already using a student Instructional Assistant (IA) to support student learning during class time because the LA program incorporated training in active learning approaches. Faculty could not be sure whether their IA would be a benefit or a detriment to their active learning approach or the overall classroom environment. In contrast, students recruited as LAs were interested in pedagogical training and mentorship. Faculty saw the benefit of having an assistant who had training in facilitating learning and an understanding of active learning. Even if they didn't plan to teach after graduation, the LAs were motivated to excel at their position, develop a working relationship with a faculty member, and improve their own study skills and communication abilities. Additionally, LAs were incentivized through an additional $200 stipend on top of the IA stipend for participation in the program and had their tuition paid for the 1-credit pedagogy course through the NSF Noyce grant (if they qualified as a US citizen, national, or permanent resident alien, and were a STEM major).

Because of the Noyce program's focus on STEM teacher training, the LA program's initial structure involved identifying faculty and students who could be recruited from STEM departments. We started the program across STEM disciplines with nine LAs in semester one and 11 LAs in semester two in introductory STEM courses. This strategy worked as we knew we had a pool of STEM faculty using active-learning approaches and students who might be interested in teaching. Other benefits to structuring the program with these two groups (STEM faculty and students) were that most of the funding for the LAs would be covered by the STEM department since they were being hired to replace an IA, and the hiring process was handled by departmental and grant program staff who could facilitate the hiring process.

Most LA programs initiate in a single department because buy-in and an understanding of the function of a Learning Assistant by several departments can be challenging depending on departmental culture. We encountered some challenges to structuring the program across STEM disciplines. First, the program wasn't centralized (LAs were hired by different departments). This required us to be extra diligent in tracking students across departments to confirm they were successfully hired and could begin when the semester started. Second, communicating how the LA program operated and that it was for all STEM disciplines challenged the coordinator in recruiting and hiring LAs. This challenge was often alleviated by the administrative support by the STEM Education Center staff which served to further legitimize the LA program during its initiation. Despite this challenge, having a faculty member as the LA program coordinator to champion the first several years of the program was critical to its implementation. Third, because each department had its own guidelines for assigning IAs, some LAs ended up earning twice as much as others. While we could not equalize the pay across departments, the fact that the LA received an additional stipend was incentive for students who were interested in participating. Fourth, departments were occasionally skeptical about hiring first- or second-year students, preferring those in their senior year. We gave clear messaging that an LA with 2-3 years remaining who has just taken a particular course is beneficial because then the subject matter is fresh on their mind and the LA can work multiple semesters which only makes the student's training in pedagogy that much richer. Fifth, and most significantly, because an LA was replacing an IA, faculty often expected their LA to do some grading in addition to their role in the classroom, which is not a best practice when it comes to fostering relationships between LAs and students (Learning Assistant Alliance Resources, 2012-2023). We had to continually remind the faculty that their LAs should not be assisting with "teaching" but with "learning" in the classroom.

LA and Faculty Recruitment

We recruited LAs using strategies that engaged students, faculty, or both. To recruit students to be LAs, the LA program coordinator and other faculty who had taught with LAs visited sophomore-level classes of other STEM faculty. By doing this, more STEM faculty teaching those classes also learned about the LA program. We also created a recruitment flyer and placed this in and outside of STEM classrooms. The flyer drove students to an LA program website with more information and an application. These students were encouraged to approach faculty members they were interested in working with and directly ask them if they could work for them as an LA which was another effective way to recruit faculty. Often the student already had some ideas for how an LA could support learning in that class, and the student and faculty member already had a rapport, which more often led to a successful partnership. When this was not the case and faculty and student were separately interested in the LA program, the LA program coordinator was challenged to match the students to an appropriate class and faculty member based on their transcript, course interest, course schedule, and one faculty reference (instead of a reference letter). The faculty reference was contacted by the LA coordinator who sent the email outlined in Figure 1 to the faculty member. This represents yet another faculty recruitment strategy. A summary of these recruitment strategies is outlined in Table 1.

As a learning assistant, [NAME] would be helping other students work through material in the classroom. In your opinion:

1. Would [NAME] be able to effectively facilitate learning in the classroom (with some additional training)?
2. Is [NAME] responsible? Is she organized?
3. Is there anything else we should know?

Figure 1. Recommendation email sent to a faculty member or an LA application

Table 1. Strategies for LA and Faculty Recruitment

LA Recruitment Strategy	Faculty Recruitment Strategy
Visit sophomore-level classes to encourage participation.	Visit sophomore-level classes to encourage participation.
Drive students to LA Program website through strategically placed campus flyers.	Approach faculty that recruited LA is interested in working with.
Identify students in own classrooms who would make good LAs.	Inform LA's faculty reference about LA program.

LA Pedagogy Course Implementation

One of the essential pieces in any LA program is initiating the pedagogy course. There are many variations on this course at different institutions, ranging from 0-3 credits, single or multiple semesters, and taught by education or STEM faculty. We chose to have a one-credit course taught primarily by STEM faculty that LAs would take during their first semester in the program. Because our students must pay extra for credit hours exceeding a threshold (to encourage graduation), students often do not take extra credit hours beyond those required in the standard curriculum for their major, so a one-credit-hour course seemed appropriate. However, after six years of implementation, we recognize the value of the practicum activities recommended by the Learning Assistant Alliance and the challenge it represents to complete such activities in a 1 credit-hour course. Our course was initially set up as MAT 4930 (math special topics) until the course was approved through curriculum committees as ISC 2290. The course title and description are shown in Figure 2.

ISC 2290 Math and Science Education - 1 credit

This course helps Learning Assistants integrate educational theory, pedagogy, content, and practice. Course meetings will focus on practical concerns as well as associated theoretical models, and will include weekly readings, discussions, reflections, projects, and presentations.

Figure 2. Title and description for the LA Pedagogy course, ISC 2290.

Another factor in implementing the LA pedagogy course includes finding qualified faculty to teach this course. We strongly recommend sending a group of faculty to an LA training workshop before implementing an LA pedagogy course. This ensures that you have a pool of faculty to draw from when initiating the course. This could be the annual International Learning Assistant Conference or a regional workshop. Regional workshops occur every few months at locations in the U.S.

Table 2. The LA pedagogy course has evolved to include new topics and assignments based on LA feedback

Fall 2016	Fall 2023
Topics • Open & Closed Questions • Discussion Techniques: univocal/dialogic discourse • Questioning Strategies and Question Types • Mental Models • Student Conceptions & Formative Assessment • Student Conceptions in the Content Areas • Motivation & Cooperative Learning • Argumentation and metacognition • Learning Theory • Student Evaluations & Effective Teachers • Scientific Practices • Multiple Intelligences and Differentiation *Assignments* • Reading Reflections • Field notes • PowerPoint Presentation • Action Research Project	*Topics* • What is an LA? • Questioning & Wait Time • Growth Mindset & Motivation • Learning Theory & Study Strategies • Team Dynamics & Cooperative Learning • Belonging & Inclusion • Justice, Grace, and Identity • Formative Assessment & Giving Effective Feedback • Self-Directed Learning (Metacognition) • Mentoring & Social Support • Noticing & Eliciting Student Ideas (Mental Models) • What the Best Teachers Do *Assignments* • Reading Reflections • Field notes • Get-to-know your students* • Mid-Semester Feedback* • Reflective Presentation* • Project** *Completed by LAs in their 2nd semester **Completed by LAs in their 3rd semester

A final piece of the LA pedagogy course that we have initiated is an "LA LA" for the course. This is an experienced LA who works as an LA for the pedagogy course adding an extra layer of mentoring or support for the new LAs. Another option for supporting new LAs that many institutions implement is an LA mentoring program. However, an LA mentoring program requires extra coordination and management, while an LA LA lightens the load for the pedagogy instructors by providing an extra set of eyes on student reflections and answering common questions about assignments.

While these are not the only pieces of LA programming that could be considered, these building blocks were necessary pieces to the implementation and subsequent growth of our LA program.

INSTITUTIONALIZING THE PROGRAM

Most Learning Assistant programs originate as part of a grant or with seed money from the institution and ours was no exception (Barrasso & Spilios, 2021). Eventually, the time comes to consider how the program will be sustained long-term. Will the program stay small? Or will it expand to other departments and more students? What are the goals of the program? The answers to these questions will be unique to your institution.

When working to sustain and institutionalize an LA program, we leveraged the fact that Learning Assistant programs are at the intersection of teaching, scholarship, and service. Discussing the benefits of an LA program can occur at various institutional levels across campus. Regarding teaching, faculty working with LAs in their classrooms are trying an innovative, evidence-based teaching method. They may also see LAs as an effective way to implement active learning, which was previously too daunting in a large class by themselves or alongside untrained assistants.

In terms of scholarship, because the LAs and faculty meet weekly and the LAs are encouraged to study how students learn and to create learning materials, both faculty who teach the pedagogy course and faculty who work with LAs may be more inclined to engage in research connected to teaching. This may include the scholarship of teaching and learning (SoTL) or discipline-based education research (DBER) occurring at greater levels than they had before the program existed, leading to new avenues of scholarship for these faculty members. Additionally, students may consider scholarship in these areas within their disciplinary field. As part of the pedagogy course, they may even complete a research project, as our LAs did during the first four years of the program.

Faculty service may include mentoring the learning assistants and faculty new to working with LAs in their classes or new to active learning approaches altogether. Faculty may also serve their departments and institutions by forming learning communities to work together to improve a course, meeting weekly as a team with all LAs to prepare for the week. When these roles are formalized, we saw these develop into departmental coordinators or course coordinators.

Two factors that contributed to institutionalizing our LA program included: engaging across institutional units and evolving the pedagogy course.

Engagement across institutional units

Having more than one institutional unit interested in the program was instrumental to us in institutionalizing the LA program. As described earlier, our program began as part of an NSF Noyce grant which was housed within our Center for STEM Education. With two years of funding for the program remaining, we started looking for other opportunities to sustain our effort.

During year three, one of us (Johnson) served on a committee focused on undergraduate research embracing student-faculty involvement. This committee had funds available for special-interest projects. Supporting an LA program where students partner with faculty to become an instructional team, while also learning about the scholarship of teaching and learning and how it applies to their discipline aligned with the committee's goals. This new collaboration guided the growth of the program, including its expansion to disciplines outside of STEM.

At the same time, the LA program began collaborating with the Center for Academic Achievement (CAA) whose director at

the time was one of the authors of this paper (Singh). Because the pedagogy course topics overlap with the training provided to the peer leaders in Peer Tutor and Supplemental Instruction roles, the center's staff were eager to work with the LA program as it expanded. The LA program provided an opportunity to serve as a bridge between the institution's student success and academic affairs units.

The CAA's support was also essential in institutionalizing the pedagogy course, as we moved to diversify the instructional team. In the first years the course had been taught by a single professor in Mathematics, and we wanted to bring in more faculty from other disciplines so that their perspectives could help the course grow and evolve. We also moved to a co-teaching model, pairing a faculty member with an instructor from the CAA for each section, ensuring that at least one person on the team had prior experience with the course. The LA pedagogy instructional team (from all sections of the course) included an experienced "LA LA" who worked as an LA for the pedagogy course itself and met weekly to plan, discuss, and stay organized.

Evolution of the pedagogy course

As might be expected, the pedagogy course also evolved during this time, becoming more dynamic and responsive to the LAs' interests and needs, shown in Table 2. Together we reorganized the course project's framework and clarified the learning outcomes. The project now allows LAs the option to develop a lesson that they facilitate during the pedagogy course itself, which makes the project more self-contained and less dependent on the faculty mentor to give up their class time for the project. Prior to this reorganization, if an LA could not use class time in their assigned course, they had to facilitate their designed activity/lesson out of class, which was not ideal and often resulted in low attendance. Another option if class time was not available was that they may record and analyze their interactions with students or conduct peer observations with another LA. The new structure provided the pedagogy course instructors and the LAs a clearer framework for the LA project.

Other modifications as the course matured included discussions surrounding diversity, equity, and inclusion (DEI) in the classroom and teaching with empathy. LAs now discuss ways that they can include all students in discussions through role playing and case studies, considering their own identities and experiences, and hearing from a first-generation student about the additional difficulties they might encounter. The CAA connected the LA program with the Office of Institutional Equity and Compliance which, at the time, organized a Diversity and Inclusion certificate program to discuss DEI and the classroom. Our ROCK (Roots of Compassion and Kindness) Center led the LAs in a session about teaching with empathy.

Communication with faculty who teach with LAs has also evolved over the years. Initially, faculty were informed of course topics through a weekly summary email. This was first written by the LA program coordinator and then as the program grew, was written by the LA for the LA pedagogy course. Currently, we use a website to communicate with the LA faculty which includes course readings and supplemental videos so the faculty have all the information readily available regarding what their LAs are learning. [1]

To train faculty and staff for leadership roles in the LA program and to teach the pedagogy course, we began to take advantage of regional workshops and the annual international conference held by the Learning Assistant Alliance. These experiences are invaluable to growing an LA program effectively. Workshop sessions regularly include advice on running weekly preparation sessions, incorporating LAs into the classroom, connecting pedagogical topics to the LAs' practice, funding and sustaining a program, and thoughtfully considering inclusivity in the classroom.

For the first three years of the program, we ran one section of the course each semester and scheduled it according to student and faculty availability. Even as the program grew, we maintained one section. Many experienced LAs returned so there were only 10-15 new LAs to enroll each semester. Once we had more than 15 new LAs, we expanded to offer a second section of the course which made scheduling easier. It has been helpful to offer a synchronous virtual section as an option, but in our experience, the quality of the discussions is reduced and while it was helpful during the pandemic, we do not have plans to continue the virtual option.

DISCOVERING THE ROLE OF THE LA IN STUDENT LEARNING

As mentioned previously, this LA program began as a recruitment tool for an NSF Noyce Teacher Scholarship program. For the first three years, the main purpose of our LA program was to recruit secondary teacher candidates from the LA STEM majors. Our focus was training teachers. As such, we were more concerned with the number of Noyce scholars that we were recruiting and less concerned with measuring the learning that was occurring in the LA's classrooms or measuring things like student success, learning gains, and student satisfaction.

However, by year four (2020), we considered that perhaps we could use the data collected within the LA program to determine how the role of the LA was being perceived, particularly in relation to student learning. We had three measures collected during the 2020-2021 academic year at our disposal. Based on the data collected, it became clear that we could answer the following research question by triangulating data from each of the measures:

How do the faculty mentors, students, and LAs perceive the LAs support student learning?

We had three data sets described in Table 3 that allowed us to answer the corresponding questions, which together addressed our main research question. We settled on searching the data sets for course components that support student learning to determine which ones were perceived to be in use.

Table 3. Data collected during regular program management

Who	What	Question Answered
Faculty Mentor	Application for LA	How were the faculty expecting their LA to support student learning?
Students in Course	Mid-semester Survey	What was the student's perception of how their LA was supporting their learning?
Learning Assistants	"Field Notes"	What did the LAs' own field note entries say about how they were supporting student learning?

Faculty Applications

Faculty must apply for a Learning Assistant through an application available on the LA Campus website, hosted by the Learning Assistant Alliance. The LA program coordinator was able to

access this data. We examined these applications to determine how the faculty member expected the Learning Assistant would spend their time while serving as an LA for their class. Some of the course components in the faculty member's responses included items that enhance student learning: hosting review sessions, office hours, recitation or small groups, a help room, and online assistance via Zoom either synchronously during an online class or asynchronously. We correlated these responses of faculty expectations for various course components with the actual activities of the LAs in their courses.

Student Mid-semester Survey

As a part of each LA-supported course, students in the class were asked to complete a survey mid-semester that asked them several questions about their LA. One of these questions was "How has the LA tried to help your learning?" This question was open-ended, and we used the qualitative method of content analysis while reading the responses. Content analysis is defined as "a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns" (Hsieh & Shannon, 2005, p. 1278). This process involves pulling ideas from the responses and coding the student responses into themes. Codes can be assigned to a portion of any size text as long as it represents a theme relevant to the research question (Zhang & Wildemuth, 2009). Two of the authors (Johnson and Frost) coded the responses manually and reviewed each other's codes to increase accuracy. We analyzed 180 responses giving feedback to 23 LA-course pairs in Fall 2020, and 137 responses for 24 LA-course pairs in Spring 2021.

Learning Assistant Field Notes

As part of the LA pedagogy course, the new LAs are asked to post 6-8 field notes during the semester. In Fall 2020, there were 23 new LAs posting a total of 211 field notes. In Spring 2021, there were 20 new LAs who posted a total of 176 field notes. For each LA, all their anonymized field notes were opened and if a particular course component was mentioned, we marked it as a yes. We didn't track how often LAs mentioned a component. Additionally, it's entirely possible that an LA may have participated in a component without including it in their field notes.

Once this data was collected and analyzed, we drew conclusions providing answers to our research question. As much as possible, we used the same themes identified during the analysis of the students' mid-semester feedback, so we could compare the two datasets.

OUTCOMES

In this section, we share results from our analysis of the three sources described in the previous section. We start with how faculty planned to integrate their LA into various course components when they applied, usually 2-3 months before the semester began. Did faculty plan to use the LA to support student learning? Next, we analyze the perspective of students in the LA-supported classrooms – how did they perceive their LA as supporting their learning? Finally, we consider the LA's field notes to gain insight into what they were doing weekly in the classroom (and outside it). Did the LAs think they were supporting student learning? We finish by discussing the alignment between the three data sets: where do they agree and where do they differ?

Faculty Applications

In Fall 2020, there were 27 faculty members using LAs, across 11 departments, with the largest number (9) coming from the Department of Mathematics. Fifty-eight LA positions were approved and 42 positions were filled. Twenty-two LAs were new to the program, and therefore taking the pedagogy course. The numbers are similar for Spring 2021 with 20 faculty members across 9 departments requesting 60 LAs and filling 51 positions, with 22 new LAs. Both semesters saw faculty requesting one LA per every 33 students on average.

Approximately one-third of these faculty taught with Learning Assistants for the first time during the 2020-21 school year. The majority of the LA faculty mentors had previously participated in one of two professional development workshops mentioned previously, but only a quarter had attended a regional or national Learning Assistant workshop organized by the LA Alliance. Three faculty members working with LAs had experience teaching the LA pedagogy course.

When faculty members applied for a Learning Assistant, they all described including the LA in the classroom using active learning methods (with the exception of one asynchronous course in the Fall semester). Figure 3 shows the percentage of applications for each semester that included the LA in each possible course component. Most faculty applicants (64% in Fall, 70% in Spring) planned to have their LAs run review sessions, either before each exam or on a weekly basis. Approximately half wanted their LAs to offer office hours to assist with homework and answer student questions. These were usually separate from the faculty member's own office hours, and the percentage of applications indicating this component increased from 39% in Fall to 55% in Spring. Conversely, we saw a decrease in the "submitted work" component, which can include both light grading and providing students with informal feedback before an assignment is submitted.

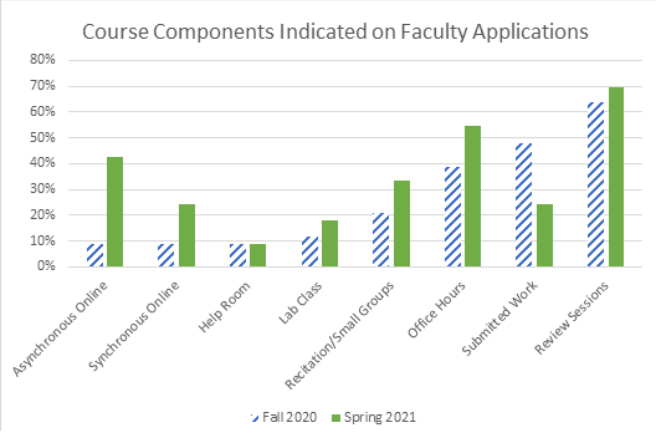

Figure 3. The percentage of faculty applications in each semester that indicated LAs would be helping with various course components.

Mid-Semester Feedback Surveys

In response to the question "How has the LA tried to help your learning?" six themes emerged. We coded the responses into these themes: 1) helps with labs, 2) helps in class with questions, 3) holds extra group study sessions outside of class, 4) meets outside of class one-on-one (office hours, for example), 5) provides extra resources, and 6) explains things well. For examples of comments coded into the themes, see Table 4.

Table 4. Examples of coded comments assigned to the theme determined during the qualitative analysis	
Theme	**Sample Comment**
Helps with labs	She explained a lab in depth to my group and I
Helps in class with questions	The LA comes to our table and explains the topics in detail if we don't understand what a question is asking. He will ask us questions and help us put the pieces together ourselves.
Holds extra group study sessions outside of class	Fun and interactive review sessions
Meets outside of class one-on-one	She has a lot of office hours and virtual meetings
Provides extra resources	Emailing out extra practice problems with solution videos
Explains things well	Giving explanations that are very understandable

The survey received 317 student responses over the two-semester period, and 33 students left this open-ended question blank. Others included comments which touched on more than one category, so overall we coded 318 phrases. The percentages are shown in Figure 4. We also distinguished between comments that indicated LAs were helping in-class versus out-of-class. Not all coded comments could be assigned in this way; for example, the last comment in Table 4 doesn't indicate whether the explanations were provided in-class or out-of-class. Out of 211 comments that could be classified, 147 (69.7%) referred to actions outside of the classroom.

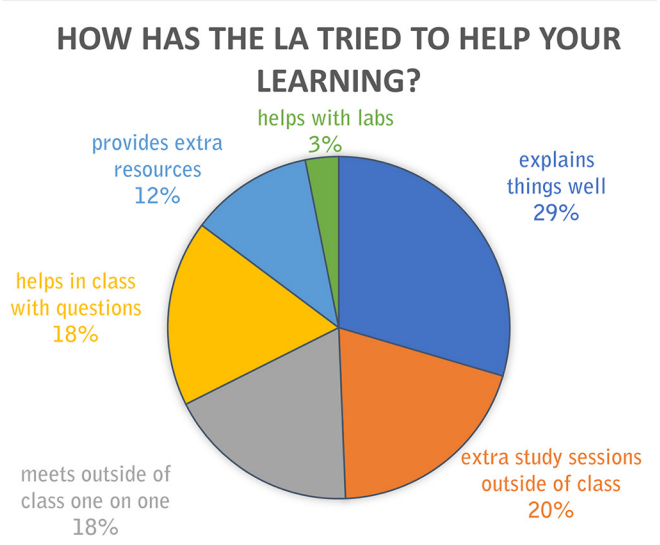

Figure 4. Percentage of the coded comments that fell into each of the themes

Further, the mid-semester survey included several Likert scale questions which shed light on how the students perceived their LA's role in the class. Most telling, 62% of students would "strongly recommend" their LA to a friend taking the same class in the future, with another 29% recommending, 8% indifferent, and less than 1% not recommending. As for the amount of interaction with their LA, 31% of students indicated "a lot," 42% "a little," 21% "once or twice," and 6% replied "never." However, most students thought their professor had set up the class in such a way that LAs could be used effectively to support learning, as seen in Figure 5.

Learning Assistants' Field Notes

For each new Learning Assistant who took the pedagogy course in Fall 2020 or Spring 2021, we read their full collection of field notes holistically and recorded whether they reflected on each of the following themes: 1) helps with labs, 2) helps in class with questions, 3) holds extra group study sessions outside of class, 4) meets outside of class one-on-one, 5) provides extra resources, and 6) interacts with submitted work. These themes match with the ones identified for the mid-semester feedback from students, except for the last. The reason for this is that the LAs were unlikely to describe themselves as having "explained things well," but they may discuss grading or leaving feedback on submitted work. We felt this was an important piece to align with the faculty mentors' expectations.

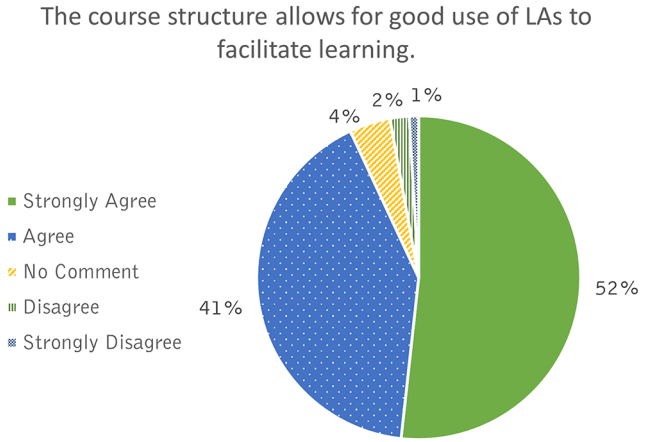

Figure 5. Question included on the mid-semester survey given in LA-supported classes

In four categories, the results were fairly similar from one semester to the next: about 16% of LAs wrote about submitted work, 95% held office hours, 77% reflected on helping in class, and 25% specifically mentioned labs. There was an increase from Fall to Spring regarding asynchronous interactions, growing from 65% to 90%. Conversely, there was a decrease in extra study sessions, dropping from 70% to 55%. The full data is shown in Figure 6 with a discussion provided in the next section.

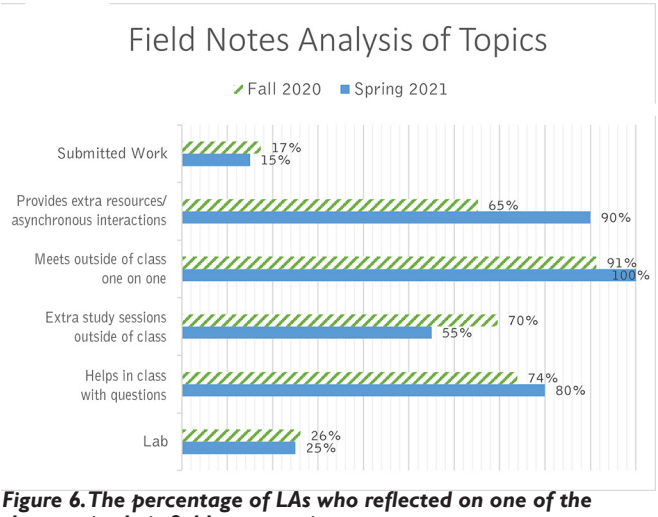

Figure 6. The percentage of LAs who reflected on one of the themes via their field note entries.

Alignment

Initially the three data sets were not developed to be aligned, however as we examined the data sets as part of regular programmatic and course review, we were able to see common threads

between how the faculty thought LAs would support student learning, how the students perceived their LAs were supporting their learning, and how the LAs reflected on their own experience in supporting student learning. All three perspectives included a significant emphasis on how LAs supported student learning beyond the classroom, which is typically de-emphasized in the LA program philosophy (Learning Assistant Alliance Resources, 2012-2023). The regularity of LAs holding office hours increased from Fall to Spring in both the faculty proposals and the LA's field note reflections. Students indicated perceiving the review sessions, office hours, and extra resources as helpful, and these were mentioned frequently in the LA's field notes, but very often in the context that students weren't taking advantage of these opportunities. The LAs didn't report working more often on submitted work than the faculty members had proposed; in fact, it seemed less common than faculty originally thought it might be when they applied. Overall, there were no glaring discrepancies between the three groups.

DISCUSSION AND REFLECTION

Based on faculty member expectations, the classroom student perceptions, and the LA's own field notes, we suggest that the programming that we initiated and have institutionalized supports undergraduate student learning at the institution. Faculty expected LAs to support student learning in various ways which the students themselves perceived were being carried out through examining the mid-semester data. These elements aligned with those identified by the LAs in their field notes. While there are differences in the data from Fall to Spring, the elements that support student learning are still high and evident.

We were surprised to see the high levels of support for student learning outside of actual classroom time and how important this was to the students. This appears to be what students most appreciated, although it's possible that students considered these actions to be "above and beyond" their LA's role, and so they thought these actions were the ones most worth mentioning. Student perceptions of what most helps their learning are notorious for being incorrect (Carpenter, Witherby, & Tauber, 2020). However, it is helpful to have corroboration that the LAs are doing the various things they and their faculty mentors had planned, and also that the LAs are seen by students in an overwhelmingly positive light.

More recent work has more directly supported that LAs indeed do have a positive effect on student learning. In 2023, FGCU examined DFW rates and measures of being "on track" towards graduation in courses using LAs as compared to the same courses without LAs. They found that the DFW rate dropped from 31% to 19% when an LA is present. Further, 100% of LA faculty surveyed indicated that working with LAs allows them to do more active learning in the classroom. This analysis supports our initial suggestion that the LAs do support student learning in the classroom and will be the subject of an upcoming paper.

Through our evolution, we have shown that LA programs serve as effective tools to bolster student learning both inside and outside the classroom. They stand as one instructional support strategy that can significantly enhance student success.

LIMITATIONS AND FUTURE WORK

A clear limitation of this project was the difficulty with aligning data from instruments that were not designed with this study in mind. The data was drawn from applications, surveys, and class assignments, which were not developed to align with each other. The data was also collected at different times; the faculty data was collected in the months before the semester began, the data from the LAs was collected throughout the semester, and the data from the students was collected at a single point in time in the middle of the semester.

As a result of our initial assessments, our program is now administering a survey with similar questions and choices to all three groups at the same time, near the end of the semester. Initial results indicate a good amount of alignment between faculty, students, and LAs in the 2022-2023 academic year, but the total number of responses has been limited due to the busy time of the semester (when the survey must be administered). The majority of LAs continue to support student learning out of class during office hours or review sessions as part of their position, with 100% reporting facilitating group discussions or activities. Further, LAs work directly with students an average of 3.5 hours per week, about 50% of their total hours, which is in line with our program goals.

We are also surveying faculty regarding the evidence-based practices involving active learning and the frequency of use when working with an LA versus not. We conjecture that the total amount of such active learning (average number of minutes spent in each class on something other than lecture) increases with the number of semesters a faculty member works with LAs. As many of our faculty were new to the LA program when the data in this project was collected, along with the added complication of Covid-19, we offer this as an explanation for why LAs were doing so much work with students out of the classroom.

CONCLUSION

In summary, this paper describes the development of the Learning Assistant program that was initiated as a Noyce grant-funded recruitment tool and was sustained by the institution as a student success measure. We provide insight into implementing core aspects of any LA program including program structure, LA and faculty recruitment, and instituting the LA pedagogy course. An initial examination of data sets collected during 2020-2021 allowed us to better understand the role that an LA plays in supporting student learning and what that role looks like. How the LAs are supporting students with their learning demonstrates thematic alignment between LA field notes and mid-semester surveys from the class students regarding how the LAs support students with their learning. These themes further aligned with the components that faculty expected their LAs to support when applying for an LA. We offer this as a generalized model for how LA programs can support student learning in the classroom and outside of the classroom.

NOTE

1. https://www.fgcu.edu/about/leadership/officeoftheprovost/la-program/

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