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Near-peer Mentoring in an Undergraduate Research Training Program at a Large Master's Comprehensive Institution: The Case of CSULB BUILD

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Abstract

The California State University, Long Beach (CSULB) BUILDing Infrastructure Leading to Diversity (BUILD) program developed a near-peer mentoring component in which master's students serve as mentors for undergraduate research trainees in health-related disciplines, in addition to fulfilling teaching assistant duties. This paper has two parts. The first describes (a) the functions of this mentoring component, taking into consideration the context of CSULB; (b) the extensive year-round training curriculum for near-peer mentors; and (c) the evolution of this curriculum in response to feedback from BUILD trainees, near-peer mentors, and undergraduate research training instructors. The second part evaluates the effectiveness of the near-peer mentoring component, based on focus groups and quantitative surveys of both near-peer mentors and mentees. We offer recommendations for master's comprehensive research institutions interested in implementing near-peer mentoring within similar research training programs.

Introduction and Literature Review

Peer mentoring, including near-peer mentoring, is an intervention strategy that provides social and academic support for undergraduate students (Collier, 2017; Jacobi, 1991; Schwitzer & Thomas, 1998). The benefits of receiving peer mentoring are well-documented in the literature. Studies have shown that peer mentoring helps students feel more integrated and connected to the university (Glaser, Hall, & Halperin, 2006; Hughes & Fahy, 2009; Tinto, 1997; Yomtov et al., 2017) and increases student success and retention (Collings, Swanson, & Watkins, 2014; Pagan & Edwards-Wilson, 2002; Reyes, 2011; Salinitri, 2005).

Despite the positive outcomes of peer mentoring, designing and implementing peer mentoring programs that are robust and impactful presents challenges. In a review of mentoring programs

for historically underrepresented students, Haring (1997) reports that many mentoring programs did not persist over time, evidently due to the lack of a conceptual base (Burlew, 1990). Most mentoring programs that are targeted towards serving historically underrepresented students have similar features such as matching mentees with a mentor who has a comparable background (e.g., academic interest, race, and gender), providing initial training for mentors, and assigning a staff or faculty member to oversee mentors. Often, these programs are designed based on intuition and with little reference to research or practice (Haring 1999).

Although identifying the skills and knowledge needed for high quality peer mentoring may seem a matter of common sense, the implementation of successful peer-mentoring programs requires clearly defined expectations of skills and knowledge and a commitment to providing training to peer mentors that will enhance such skills (Garvey & Alred, 2000). In an extensive review of 300 mentoring programs, lack of training or understanding of program goals and responsibilities has been identified as a common weakness of mentoring programs (Ehrich, Hansford, & Tennent, 2004). A study done on a research-focused diversity initiative reported that peer mentors struggled to understand program features and how their role fit within the program (Keller et al., 2017). This is particularly challenging during the early stages of implementing a research training program, when its components are being solidified. However, identifying and articulating what peer mentors are expected to know and do is a crucial step for the effective function of peer mentoring programs (Colvin & Ashman, 2010; Dawson, 2014).

Collaboration between the implementers and practitioners of educational interventions contributes to program success (Anderson & Shattuck, 2012; Barab & Squire, 2004). In the case of peer mentoring, the implementers are faculty and staff who design the mentors 'training curriculum and the materials the mentors will use with trainees. Yet as practitioners, peer mentors bring a unique perspective regarding the needs of mentees and the challenges of the peer mentoring process that the intervention implementers, as well as faculty mentors, may not anticipate. Therefore, creating opportunities for peer mentors to provide ideas and feedback on their own training can help close the gap between "what works" and "what works where, when, and for whom" (Means & Penuel, 2005).

The first part of this paper describes the development and implementation of a near-peer mentoring component within the California State University, Long Beach (CSULB) Building Infrastructure Leading to Diversity (BUILD) program, focusing particularly on the year-round training curriculum for near-peer mentors. In designing the near-peer mentoring component, the following strategies were considered: a) explicitly defining the role of a near-peer mentor within the context of CSULB BUILD; b) identifying and categorizing skills and knowledge (i.e., technical, interpersonal, and cultural skills and knowledge) near-peer mentors must demonstrate; c) providing targeted training for developing skills and acquiring knowledge; d) enhancing collaboration among local experts (CSULB faculty and staff with expertise in near-peer mentor training), near-peer mentoring practitioners (graduate students), and implementers (staff and faculty) in developing the training; and e) iterative analysis, development, implementation, and

evaluation of the training. The second part of this paper focuses on the results of the evaluation of the near-peer mentor training curriculum, using mixed methods and incorporating responses from both near-peer mentors and trainees. Finally, we provide recommendations for implementation of a near-peer mentoring component within research training programs on other campuses based on the findings of this paper and previous recommendations from the literature.

Background: CSULB BUILD

To understand the purpose and evolution of the near-peer mentoring component, it is important to understand the context within which it arose, namely the specific purpose and structure of CSULB BUILD and the characteristics of CSULB as an institution. CSULB is a large, urban campus in Southern California. As of 2018, the total number of students at CSULB was 36,846, which included 31,447 undergraduate and 5,399 graduate students. Among undergraduates, 43% identified as Hispanic/Latino, 22% as Asian, 17% as White, 4% as Black or African American, less than 1% as American Indian or Alaska Native, less than 1% as Native Hawaiian or other Pacific Islander, 5% identified with two or more races, 3% with unknown race and/or ethnicity, and 6% identified as international students. Reflecting this diversity, CSULB is designated as both a Hispanic Serving Institution (HSI) and an Asian American and Native American Pacific Islander-Serving (AANAPISI) Institution. CSULB is a commuter campus with 96% of students living off campus. In terms of gender, 57% of undergraduates identified as women and 43% as men. Over 50% of CSULB students are first-generation college-educated, lower-income, and Pell Grant eligible (Urizar et al.,2017).

The demographic composition of BUILD students is mostly representative of the campus: Among a total of 281 BUILD students through the first four years of the program, 43% identified as Hispanic/Latino, 55% as non-Hispanic, and 2% with unknown ethnicity. In terms of race, 33% identified as Asian, 24% as White, 6% as Black or African American, 3% as American Indian or Alaska Native, less than 1% as Native Hawaiian or other Pacific Islander, 8% identified with two more races, 26% with unknown race. Among BUILD students, 62% identified as women and 38% as men. In addition, 47% were classified as first-generation college students and 73% were financial aid eligible.

CSULB BUILD is a large program, serving approximately 100 undergraduate students every year. Like all BUILD programs, it focuses on health-related research, but it adopts a broad definition that encompasses biological, physical, psychological, social, and societal dimensions of health. BUILD students can specialize not only in laboratory-based disciplines, but also in community- or field-based disciplines. Because of this, students are drawn from a wide range of majors, such as chemistry, biology, biomedical engineering, kinesiology, gerontology, speech pathology, psychology, linguistics, and anthropology. Their majors are spread across four colleges within the university (Engineering, Health and Human Services, Liberal Arts, and Natural Sciences and Mathematics). Creating connections among this intellectually diverse group of students and providing a common professional development experience for them are among the main challenges the program faces.

CSULB BUILD offers three cohort-based programs: a) Associates, a one-year sophomore program; b) Scholars, a two-year junior-senior program (with an optional 5th semester for students graduating in the fall semester); and c) Fellows, a one-year program for seniors who already have some research experience (see Figure 1). The Associates program provides an introduction to research where students learn basic scientific communication skills such as research poster and paper presentations and participate in faculty-mentored research during the academic year. The Associates have the option of applying to continue in one of the upper-division programs (i.e., Scholars or Fellows). The two upper-division programs provide an intensive faculty-mentored research opportunity, more advanced scientific research communication skills training, and support in preparing graduate school applications.

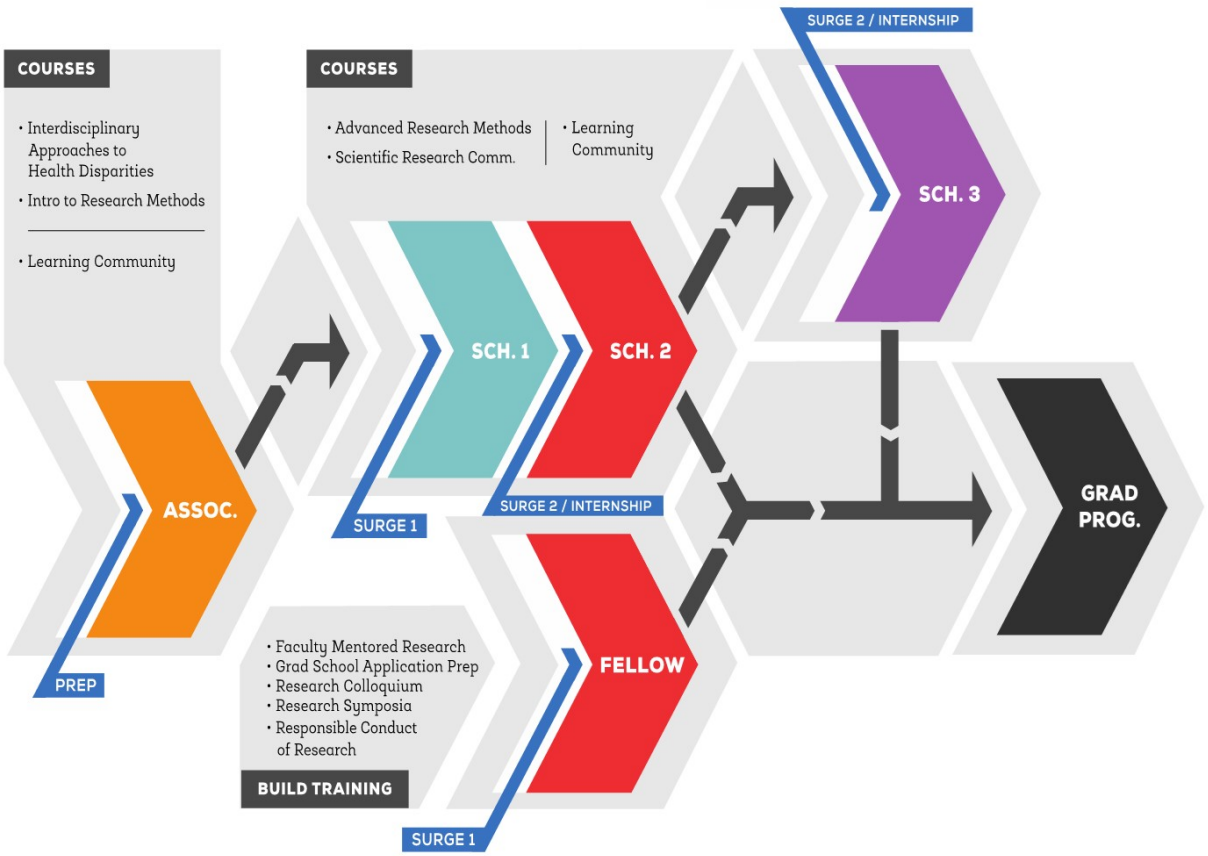

Figure 1. CSULB BUILD Progression Chart

As part of their training, CSULB BUILD students begin the program by participating in an intensive summer training program. Upper-division students participate in the 8-week long Summer Undergraduate Research Gateway to Excellence (SURGE), during which they kick off their faculty-mentored research for 30 hours per week during the summer and participate in an intensive professional development course. Lower-division students participate in a two-week

summer program called Preparing for Research Excellence Program (PREP), during which they are introduced to and build the foundation of research culture. During the academic year, students work in a faculty research group for about 15 hours per week. They also participate in a weekly professional development seminar (Learning Community) and take research-infused courses such as Introductory or Advanced Research Methods, Scientific Research Communications, and Introduction to Health Disparities that were developed by the CSULB BUILD program. Other required activities include attending research workshops, presenting a poster at an on-campus summer symposium, attending at least one research conference (e.g., SACNAS, ABRCMS, and/or discipline-specific conferences), and taking group field trips to nearby research-intensive partner institutions (University of California, Irvine, and University of Southern California). In addition, many students in the Scholars program participate in a summer research internship at a research-intensive institution after they complete the first year of the Scholars program.

The Learning Community seminars are co-facilitated by faculty, known as "training directors," from relevant disciplines. The seminars cover academic skills that are applicable across disciplines, such as preparing a literature summary, delivering an "elevator speech," writing a conference abstract, and designing and presenting a poster. Students prepare an Individual Development Plan—identifying their short- and long-term goals—and create application materials for summer internships and graduate school, including their curriculum vitae (CV), cover letters, and personal and research statements. They are also trained on "soft skills" such as stress management, research ethics, best practices in communicating with mentors, growth mindset, and cultural awareness. Because of the large size of these Learning Communities, and unique assignments, which require extensive review and feedback, students are assigned to a graduate mentor, generally matched by the broader disciplines (i.e., natural sciences, social and behavioral sciences, health sciences, and engineering).

The Role of Graduate Mentors. Research shows that students benefit from having multiple mentors whom they can seek out for their multi-dimensional personal and professional needs (Nora & Crisp 2007; Wallace, Abel, & Ropers-Huilman, 2000). The CSULB BUILD program uses a multi-tiered mentoring model with the aim of providing holistic mentoring support to help students meet their academic, professional, and personal goals (Crisp, 2010; Luedke et al., 2019; Patton & Harper 2003). Consequently, CSULB BUILD students receive mentoring from three groups of mentors: a) training directors, who are faculty members that run the professional development Learning Community seminars and monitor students 'progress towards academic goals; b) faculty research mentors, who provide research training in discipline-specific skills and knowledge while students work in their research labs; and c) graduate mentors, who provide near-peer mentoring to 5-10 students that are typically from the same college. Here, near-peer mentors are master's students who recently navigated the graduate admissions process and as such are more relatable to undergraduate students than their faculty mentors. The graduate mentors are known as GMs (as they will be referred to below).

For a student who wants to pursue graduate education, it is valuable to have role models who can show them that success is possible, as well as pass along formal and informal skills and knowledge for navigating higher education (McKinsey, 2016; Santos & Reigadas, 2004; Wallace, Abel, & Ropers-Huilman, 2000). First-generation students, having neither a parent nor guardian who has obtained a college degree (Mehta, Newbold, & O'Rourke, 2011), are far less likely to be guided by their family's college experiences, so it becomes important to find mentors and role models on campus (Horn & Carroll, 1998; Thile & Matt, 1995; White & Lowenthal, 2011). At research-intensive institutions, undergraduates may informally find role models among graduate students, who often interact extensively with undergraduates as teaching assistants or lab assistants. Graduate-undergraduate connections are further fostered in a campus environment where both groups spend much of their time on campus and form social ties through clubs and activities. Through knowing graduate students, an undergraduate learns about what it means to be a researcher, as well as what to expect in graduate school.

At CSULB, certain departments, such as Biological Sciences and Psychology, have a relatively traditional research culture in which graduate students often supervise undergraduates working in faculty labs. In many other departments, however, the undergraduates have relatively little opportunity to get to know graduate students or be exposed to research culture through them. Only 15% of students at CSULB are enrolled in a post-baccalaureate program. Many of the post-baccalaureate programs are professional degree programs, some of them offering primarily weekend and evening courses for working students. Furthermore, not all undergraduate programs use graduate teaching assistants. The fact that CSULB is primarily a commuter campus also limits students 'opportunities to feel part of an academic group, develop an academic identity, and be socialized into the academic world (Clark, 2006; Jacoby & Garland, 2004; Kuh, Gonyea, & Palmer, 2001; Wolfe, 1993). This is particularly true for first-generation college students. These students face additional challenges, including having to navigate post-secondary institutions without the social capital or connections to individuals who are able to provide network-specific resources not otherwise accessible without having an "insider" (Coleman, 1988).

For all of these reasons, the BUILD GMs help fill an important gap in undergraduates ' socialization into research. The goals developed over time for our GM component include: 1) communicating with undergraduate research trainees and being a liaison between them and their training directors; 2) increasing trainees 'sense of belonging to the university and the CSULB BUILD program; 3) increasing undergraduate trainees 'self-efficacy in seeking out personal, academic, and professional assistance; and 4) strengthening undergraduate trainees 'science identity.

As shown in Table 1, the responsibilities of the BUILD GMs have significantly expanded since the first year of implementation of the BUILD undergraduate research training program. Since Year 1 of implementation, a key duty has been to attend the weekly Learning Community seminar where, for many weeks, they lead a breakout session with their assigned undergraduate trainees.

Breakout sessions are activity-based, small group discussions. Activities might include practicing stress management techniques, practicing elevator speeches, or giving feedback on one another's research posters. The breakout sessions also serve an important social function, as they offer the main space where BUILD trainees from different research groups interact closely with each other. After each Learning Community seminar, GMs meet with the training directors. The primary function of these post-seminar meetings is to discuss the outcome of the day's activities and prepare for upcoming seminars and assignments. It also provides ongoing, built-in opportunities for GMs to raise issues they are observing within their group or obtain clarification from training directors on questions that students are hesitant to ask directly, a mechanism for GMs to serve as liaisons between students and training directors.

The NIH BUILD Initiative's mission is to enhance the diversity of the health-related research workforce. One of the ways we have sought to achieve that goal was to expand our outreach to historically underrepresented students who would not typically seek out research. The CSULB BUILD program also sought to scale up the size of undergraduate training programs to create a sustainable culture of undergraduate research at CSULB. Pursuing these two goals created the challenge of providing extensive feedback on research-related and professional development assignments to a large number of trainees that was beyond the capacity of the training directors. It also became clear that in a larger cohort of trainees, it was easier for some trainees to fall through the cracks or become disengaged. To respond to these critical training needs, in Year 2 the BUILD GMs also took on grading responsibilities, began holding regular weekly office hours, provided one-on-one feedback on assignments during individual meetings, and made more deliberate attempts to develop a closer mentoring relationship with their mentees. GMs were also tasked with collecting student outcome data (e.g. conference attendance, graduate program application, etc.) in one-on-one meetings. Office hours are held the BUILD Center, a dedicated study space for BUILD program trainees and GMs to meet and interact.

In Year 4, two new duties were added to enhance GMs 'engagement with and contribution to the wider CSULB BUILD program. The first was an original "leadership project" (described later). The second was a requirement that GMs visit the research lab of each faculty member who was training one of their mentees. The purpose of these visits was to learn about the type of research the student would be doing, the faculty mentor's expectations for the student, and any discipline-specific information of which the faculty mentor would like the GMs to be aware.

The number of GMs in a given semester averages around 15 with a target ratio of about eight trainees per GM. Each GM normally works with the same group of students for one full academic cycle, from summer through spring. Students continuing in BUILD for multiple years do not always have the same GMs from year to year. Given that most graduate students are in a masters 'program for 2-3 years, there is considerable GM turnover. For example, only a quarter of GMs from 2018-2019 continued with the program in 2019-2020. Mid-year GM attrition is also a moderate issue: during 2018-2019, two out of 17 GMs left CSULB, and two terminated their GM position early.

Table 1. GM Duties by Academic Year

Duties	Implementation Year			
	Year 1	Year 2	Year 3	Year 4
Attend students' weekly learning community seminar; followed by meeting with training directors	✓	✓	✓	✓
Facilitate breakout sessions during some seminars	✓	✓	✓	✓
Track students' seminar attendance and assignment submission	✓	✓	✓	✓
Provide feedback to training directors on lesson plans	✓	✓	✓	✓
Assist with BUILD campus events and fieldtrips	✓	✓	✓	✓
Grading (e.g., posters, CVs, personal statements, research statements)		✓	✓	✓
Hold weekly office hours at the BUILD Center		✓	✓	✓
Collect data for NIH tracking of students (e.g., publications and grad school acceptances)		✓	✓	✓
Visit research labs of students' faculty research mentors (once a year)				✓
GM leadership project				✓

A staff member oversees the GM component, including coordinating year-round training, monitoring GM performance, organizing monthly meetings with GMs, and participating in the recruitment and hiring of new GMs.

Selection of Graduate Mentors. In a review of 54 articles focused on peer mentoring, Terrion and Leonard (2007) classified 10 mentor characteristics based on the two mentoring functions, namely, career-related and psychosocial functions (Kram & Isabella, 1985). They identified five desirable prerequisites for the student peer mentor: a) ability and willingness to commit time, b) gender and race, c) university experience, d) academic achievement, and e) prior mentoring experience. As the authors describe, for student peer mentors serving the career-related function, the most important characteristics are sharing the same program of study as mentees and the mentor's motivation for self-enhancement. For the psychosocial function, the most important characteristics are good communication skills, supportiveness, trustworthiness, empathy, personality matched with mentees, enthusiasm, and flexibility.

Although finding all these characteristics in one mentor is nearly impossible, the CSULB BUILD program aims to find GMs that have—or show potential to develop—characteristics that fit both the career-related and psychosocial functions of mentoring. The GM recruitment occurs in the spring of each year, so that GMs can begin to work with students as they begin the BUILD program in the summer. The application process includes submitting a CV, transcripts, and statements on mentoring and research experience. Final decisions are made after an interview and reference check. Throughout the screening and selection process, potential GMs are evaluated in five main areas: a) academic skills and goals; b) motivation to mentor; c) ability to support students from diverse backgrounds; d) kindness, compassion, and maturity; and e) communication and interpersonal skills.

Academic skills and goals. GMs must have a high GPA, and excellent organizational and time management skills. GMs who plan to apply for PhD programs, who have worked in labs, and have presented at research conferences, and those who may want to pursue a career path that requires teaching and mentoring skills are preferred.

Motivation to mentor. GMs should see their work with students as "more than a job." GMs who like working with students and have a passion to see them succeed are most effective in helping students. They should also show motivation for self-enhancement; GMs who genuinely desire to gain mentoring and academic skills will be more likely to benefit from training. These qualities are assessed primarily through the job interview.

Ability to support students with diverse backgrounds. GMs who share similar life experiences as our undergraduate trainees, such as being first-generation, from a low-income background, or from a historically underrepresented group, and/or who express empathy and understanding of the challenges encountered by students with diverse backgrounds can serve as important role models to our trainees.

Kindness, compassion and maturity. Research shows that kindness cues affirm social inclusion (Estrada, Eroy-Reveles, & Matsui, 2018). As a program that is invested in promoting inclusion, it is important for CSULB BUILD to make sure students are treated with kindness. During the interviews, GM candidates are presented with scenarios involving troubled students and are asked to describe how they would handle the situation. They are evaluated by how they demonstrate compassion and sensitivity in their responses.

Communication and interpersonal skills. GMs need to provide thoughtful and constructive feedback to students and training directors and display the ability to listen and understand others. Not all GMs have highly outgoing personalities, but they need to be at ease in small groups. These qualities are assessed during the in-person interviews.

The GM role is a paid graduate assistant position for 10 hours per week during the academic year and 10-15 hours per week during the summer. GMs are limited by the university to work no more than 20 hours per week so that it does not impact their own degree progress, but the

majority of BUILD GMs have this as their sole employment. While the position is technically classified as a graduate assistant position, the GM role goes beyond that of a typical graduate assistant and requires tailored trainings specifically focused on mentoring undergraduate students from diverse backgrounds. We attempt to recruit GMs from the same colleges as the BUILD students. In some disciplines this provides a valuable source of paid positions which may not be plentiful, but it is relatively difficult to recruit graduate students from natural science fields because they can typically earn more as teaching or research assistants in their departments. When enough natural science graduate students cannot be found, GMs with natural sciences bachelor degrees (regardless of graduate degree being pursued) are chosen when possible.

Development of the Graduate Mentoring Training Curriculum

The training of GMs evolved considerably over the first four years of the GM component. During the summer of the first year (2015), GMs participated in a three-hour orientation facilitated by the student training director where an overview of the NIH BUILD initiative and CSULB BUILD Training Program was presented. In addition, during 1- to 2-hour sessions, GMs received training on the differences between facilitating and teaching, and on developing mentor-mentee communication. For these training modules, parts of a curriculum designed to train STEM academic research mentors (Branchaw, Pfund & Rediske 2010; Pfund, Branchaw, & Handelsman, 2015) were used.

As the roles and responsibilities of the training directors expanded over the years with the addition of the Associates Program and later the Fellows Program, the need to transfer the GM training and supervision responsibilities to a full-time staff member arose. CSULB BUILD hired a GM Trainer (the first author of this paper, succeeded by the second author) who, as former BUILD GMs, brought valuable insights to improve the GM training curriculum. The GM Trainer was able to identify areas for improvement through a bottom-up approach, drawing from personal experiences as a GM and developing specific, targeted trainings that addressed the program's needs. Thus, challenges the BUILD program faced during the initial stages of implementing the research training program informed efforts to flesh out the role of the GMs in the BUILD program structure.

In response, we developed a year-round training curriculum focusing on three domains: a) *technical skills and knowledge* (e.g., grading, using rubrics, and learning about the BUILD program requirements), b) *interpersonal skills* (e.g., communication skills and emotional intelligence), and c) *cultural skills* (e.g., cultural capital model, learning about your peers 'cultural background and values, and culturally-responsive mentoring) (Tables 2-4). We encouraged collaboration among implementers, local experts, and practitioners. Specifically, in developing some training modules, CSULB BUILD collaborated with CSULB faculty and staff who have expertise in those areas and reached out to campus resource centers such as the Center for Latino Community Health. In addition, the program created opportunities for GMs to co-design training modules, such as the module on Case Studies (Table 3), utilizing GMs 'experiences and expertise to help inform the training needs for future GMs. The list of training topics expanded

each year, with each new area for training identified based in part on GM feedback. GMs responded to a survey after each training session and were encouraged to provide feedback as a group or in person to the developers of the GM training. Through the practice of iterative development, implementation, and evaluation, CSULB BUILD aims to improve the GM training curriculum each year (Figure 2).

Figure 2. Iterative Development of the GM Training Curriculum

Table 2. Technical Trainings for GMs Implemented in the CSULB BUILD Program.

		Training module	Description
Technical skills and knowledge	Summer orientation	Personnel introductions	Meet over a dozen staff members and training directors, learning about the role of each. GMs and staff each make a PowerPoint slide describing themselves (45 minutes)
		BUILD overview	Overview of National BUILD program, NIH goals, structure of CSULB BUILD (1 hour)
		GM memorandum of understanding (MOU)	Review of duties, requirements, time commitments, communication rules; formally sign MOUs (1 hour)
		Campus resource scavenger hunt	Visit and collect brochures from campus services, such as the Writing Center, Disabled Student Services, Career Services, Counseling, and the library (1.5 hours)
		Learning management system	Communicating, giving feedback, logging attendance, and grading in the learning management system (1 hour)
		Activity log tracking	Monitoring student activity logs (30 minutes)
		Staying connected	Create a LinkedIn account; connect to BUILD social media, add BUILD info to e-mail signature (0.5 hours)
		Program requirements	Overview of student Memorandum of Understanding (0.5 hours)
	Fall/Spring	Data entry using FileMaker software	Using FileMaker, a data warehouse software, to log student progress (e.g., completion of training requirements) and accomplishments (e.g., awards, scholarships, graduate school acceptance) (1 hour)
		Responsible conduct of research	GMs choose between a variety of trainings such as responsible authorship, enhancing reproducibility, conflict of interest, and data sharing and ownership, which are facilitated by various research faculty at CSULB (8 hours)
		Breakout session lesson plans	Training directors introduce plans for the following week's breakout sessions (~3 breakouts/semester, 0.5 hours)
		Student Writing Assessment Training (SWAT)	Evaluation of student's progress toward meeting learning objectives in the professional development seminar. How to provide a consistent, unbiased, and informed assessment of students' work with an emphasis on grading the statement of purpose (SOP). (3 hours)
		Individual Development Plan (IDP)	Best practices in grading the IDP. GMs are presented with examples of a poorly developed IDP and a well-developed IDP and had GMs practice giving feedback (2 hours)

Table 3. Trainings on Interpersonal Skills for GMs Implemented in the CSULB BUILD Program.

		Training name	Description
Interpersonal skills	Summer orientation	Teaching versus facilitating	Skills for leading breakout groups (Branchaw, J., Pfund, C., & Rediske, R., 2010): recognizing different styles of discussion contribution, mock discussions to practice facilitation techniques; facing common scenarios such as when no one participates, one student dominates the discussion, or the group deviates from the topic. (1 hour)
		Mentor/mentee relationships	Best practices in communicating with students, mentor/research group issues, mental health and personal issues of mentees, role perceptions, time management issues, motivating and encouraging students and addressing questions (1.25 hours)
		Case studies	Read and discuss real-life stories of mentee issues, submitted by previous GMs (1 hour)
		Lessons from previous GMs	Panel of previous GMs share experiences and advice; mentee evaluation data on GMs and quotes that showcase the GM-mentee relationships (1.25 hours)
	Fall/Spring	Campus Assessment, Response, and Evaluation for Students (CARES) Team	Campus referral resources, CARES, and how to assist emotionally distressed students (1 hour)
		Counseling and psychological services (CAPS)	Recognizing mental health issues; suicidality; campus resources for mental health (1.5 hours)
		Stress management	Techniques for managing stress, balancing school and life (1 hour)
		Maintaining effective communication	True Colors assessment of communication styles (Miscisin, 2004)

Currently, the GM training curriculum offers several modules sorted by broad skill area as described in Tables 2-4. Training begins with a four-day summer orientation, before GMs 'first interactions with students, and continues throughout the year with two-hour training sessions approximately once a month. A variety of BUILD and other campus personnel lead the trainings. Besides allowing for utilizing expertise of campus personnel and distributing duties, this has the benefit of helping GMs to become acquainted with more faculty and staff across the university.

There are several benefits to spreading training throughout the year, rather than having it in one concentrated dose at the beginning. First, GMs cannot fully benefit from certain trainings until they have some on-the-job experience. Second, periodic trainings encourage GMs to hone their skills continuously. Lastly, the monthly meetings also help to create connections between GMs working with different trainee cohorts, who otherwise have limited interaction.

In addition to the GM training changes, efforts to improve the administrative side of GM hiring and management were taken. This included streamlining the GM application and interview process, clarifying staff and faculty role in the hiring and management of GMs, implementing policies for GM attendance and participation in professional development seminars, office hours and other BUILD events and creating a common agenda for GM-faculty meetings across all cohorts.

Table 4. Trainings on Cultural Skills for GMs Implemented in the CSULB BUILD Program.

		Training name	Description
Cultural skills	Summer	National Research Mentoring Network (NRMN) cultural box activity	Faculty, staff and GMs bring and share 3 items representing their identity, including 1 for cultural or geographical origin. (1 hour)
	Fall/Spring	Cultural capital	Cultural assets and resilience. Discussion of what culture is, 6 mistakes to avoid in cross-cultural communication as well as 6 tips on cross-cultural communication. Discussion of "Academia, Love Me Back" (Martinez, 2016) (2 hours)

Having described the development of the GM training, we now turn to the evaluation of the GM training component in Years 4 and 5. While there were two potential approaches to reporting the evaluation of the GM training curriculum—formative evaluation (i.e., feedback used to inform decisions on changes to future trainings) and summative (i.e., feedback on the effectiveness of the training) findings—this paper focuses on the summative findings to highlight the outcomes of the training model. Specifically, we explore: a) the effectiveness of the GMs in applying technical, interpersonal, and cultural skills they learned in the training curriculum and b) the effect of participation in the program on GMs. We next describe the methods of data collection.

Evaluation of the CSULB BUILD Graduate Mentor Training Program

Methods. A comprehensive evaluation of the effectiveness of the GM training program was conducted using a mixed-methods approach. The merits of including both quantitative and qualitative data are well-known for its holistic approach to program evaluation (Plano Clark, 2019). In addition, perspectives of both mentors and mentees were taken into consideration. Most mentoring literature only assesses mentors 'self-efficacy in mentoring, but it is pertinent to assess the mentees 'perceptions as well to truly evaluate the effectiveness of the mentor.

In evaluating the BUILD GM training component, we drew on four sources of data: 1) surveys from mentees (i.e., BUILD undergraduate student trainees), 2) post-training surveys from the GMs, 3) focus groups with mentees, and 4) focus groups with GMs. Measures and methods of data collection for each source is described below in Table 5. All study procedures were approved by the university's Institutional Review Board.

Table 5. Description of Data-collection Measures and Methods

Collection point	Participants	Method	Measures
Fall 2017; Spring 2018	Graduate Mentors	Quantitative/Qualitative	GM post-training survey
Fall 2018	Students	Qualitative	Student focus groups
Spring 2018; Spring 2019	Students	Quantitative/Qualitative	Student surveys
Spring 2018	Graduate Mentors	Qualitative	GM focus groups

Methods for Student Surveys. *Participants.* The sample consisted of all currently enrolled BUILD students (N = 211) at the time of survey administration. The sample was drawn at two collection time points: the spring 2018 semester (n = 116) and the spring 2019 semester (n = 95).

Measures. The student survey was developed by the external evaluation team of the BUILD program. Items were generated to capture the effectiveness of the professional development seminar in fostering skills in two domains: professional development and psychosocial. Students reported their level of agreement with statements that pertained to these domains on a six-point Likert scale ranging from 1 (*Strongly disagree*) to 6 (*Strongly agree*).

One component of the survey measures the impact of the GMs and these items were used for analyses of the effectiveness of the GM training. Items were grouped by relevance to technical skills, interpersonal skills, and cultural skills (Table 6). Three items reflected technical skills (e.g., feedback by my graduate assistant and graded assignments were returned promptly), four items reflected interpersonal skills (e.g., my graduate assistant was approachable) and four items reflected cultural skills (e.g., my graduate assistant values and respects cultural differences). A

reliability analysis was performed and showed good internal consistency for technical skills (α = 0.86), interpersonal skills, (α = 0.90), and cultural skills (α = 0.88), respectively.

Table 6. Student Survey Items

Skill	Items
Technical	Feedback by my graduate assistant and graded assignments were returned promptly
	The feedback provided by my graduate assistant was helpful
	My graduate assistant responded to my emails within 24 hours
Interpersonal	My graduate assistant helped me build my confidence
	My graduate assistant was approachable
	My graduate assistant communicated clearly and professionally
	I received quality near peer-mentoring from my graduate assistant
Cultural	My graduate assistant responded respectfully to student questions and viewpoints
	My graduate assistant worked effectively with mentees whose personal background is different from his/her own (age, race, gender, class, region, culture, religion, family composition etc.)
	My graduate assistant values and respects cultural differences
	My graduate assistant is a role model for me

Procedures. BUILD students were surveyed regularly during their time in the program, with the first data- collection occurring at the end of the summer session (i.e., SURGE or PREP) and subsequent collections occurring at the end of the fall and spring semesters during the academic year.

Students participating in the BUILD training program were emailed an individualized link to the survey site, administered using the online survey software program, Qualtrics, where they were presented with a prompt describing the purpose of the survey. As part of their contract for participating in the BUILD program, students sign a consent form to participate in this survey and subsequent surveys throughout their time in BUILD; therefore, they were not presented with an informed consent form, but were instead led to the survey items. Once the students completed the survey, they were instructed to take a screen shot of the exit page and upload it to their course learning management system to confirm completion.

Data Analytic Plan. Results from the 2018 and 2019 academic years were analyzed for the spring semesters only as they represent the end of the academic year and contain the most

comprehensive assessment of the GM's performance, following the culmination of the year-long training. Independent samples *t*-tests were conducted to compare students 'perceptions of GM competency in the three training areas from 2018 to 2019. Subsequent analyses include an independent samples *t*-test comparing differences between training years within sub-groups including underrepresented minority (URM) students and non-URM students.

Methods for GM Post-Training Survey. *Participants.* In Year 3 of the BUILD program, (i.e., the 2017-2018 academic year), GMs who participated in the training sessions were surveyed after each training session to provide feedback on the helpfulness of the training. Here, data are provided on two of those training sessions: 1) a training on how to grade and provide feedback on the SOP from 17 GMs, and 2) a training on how to recognize cultural capital from nine GMs.

Measures. The post-training surveys were developed by the GM Trainer and the program evaluator to assess the relevance and the usefulness of the materials covered in the training, the learning gains, and the usefulness of the training.

- Student Writing Assessment Training (SWAT) Post-Training Survey. The post-training survey for the SWAT session contains 17 items. Of the 17 items, 13 utilize a 7-point Likert-type agreement scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*) to assess the usefulness of this training by the GMs in performing their duties (e.g., the workshop helped me learn new skills to grade [statements of purpose]). The remaining four questions are open-ended responses, which collect the GMs 'suggestions to improve the training and propose trainings GMs would like to see offered in the future (e.g., *Do you have any suggestions/recommendations that could make this a better experience?*).

- Cultural Capital Post-Training Survey. The post-training survey for the cultural capital training session contains 22 items with 18 Likert-type questions using the same 7-point Likert-type agreement scale to assess the effectiveness of the training (e.g., *I have a better understanding of cultural capital concepts*). The survey also included four open-ended questions inviting GMs to share their suggestions to improve the training and propose trainings GMs would like to see offered in future.

Procedures. Following each training session, the GMs were asked to fill out an evaluation form in which they would evaluate the effectiveness and usefulness of the training in helping them perform their duties and provide feedback on areas for improvement. These surveys were administered on site using paper-and-pencil method and the response rate was over 90% for those who attended.

Data Analysis. Descriptive analyses were conducted by the program evaluator to show GM perceptions of the effectiveness/usefulness of the trainings and their recommendations for improvement.

Methods for Student Focus Groups. *Participants.* In Fall 2018, 17 trainees participated in focus groups or individual interviews. Participants were recruited through an email invitation issued to all BUILD Scholars as well as a classroom announcement in the Learning Community seminar. Participants included eight students in the Scholars 1 program, eight in the Scholars 2 program, and one in Scholars 3. All four colleges that participate in BUILD were represented: six students from the Health and Human Services, four from Liberal Arts, four from Natural Sciences and Mathematics, and three from Engineering. Four were male and 13 female. Eight were Hispanic or Latino, five non-Hispanic white, and four Asian. Nine were first-generation college students.

Procedures. Students were contacted by the GM Director who sent out an email invitation to BUILD Scholars, presenting them with the opportunity to provide feedback on the GM program, specifically to improve the program and to influence the decision as to whether it would survive in the second phase of the BUILD program. Participation was voluntary and uncompensated, except for a free lunch.

There were a total of three focus groups with 4-6 students in each group and two individual interviews. The students signed a consent form, and were informed that the feedback they presented was confidential and that their identity would not be revealed. Following this prompt, they were asked about their relationships and experiences with their GMs, with questions specifically targeting the GMs 'technical, interpersonal, and cultural competency, including areas for improvement.

Data Analytic Plan. Responses were transcribed by the GM Director and were analyzed using typological analysis (Hatch, 2002) to sort the data into categories according to the three training areas: technical skills, interpersonal skills, and cultural skills. The second step of coding utilized a guided thematic analysis, using the framework of the three training categories. The transcript was coded by the first and second author into technical, interpersonal, and cultural themes, and for positive or negative valence. A codebook was developed and the first two authors tested for inter-rater reliability, with high agreement among coders. When disagreement occurred, the coders deliberated until they reached 100% agreement. Within each of the three training areas, multiple comments relating to similar issues were grouped into themes. Where quotes are reported, they have been lightly edited below for disfluencies, repetition, and clarity.

Methods for GM Focus Groups. *Participants.* In spring 2018, 16 GMs were invited to participate in two focus groups about their mentoring experiences. This was the full cohort of GMs, including four from the Associates program and six each from Scholars 1 and Scholars 2. All but one were in at least their second semester of the program; five had worked 3-4 semesters. GMs represented each of the four colleges with six students from Health & Human Services, five from Liberal Arts, one from Natural Sciences and Mathematics, and four GMs from Engineering.

Procedure. Focus group interviews were led by the BUILD program evaluator. Participants were informed that their responses would be kept confidential and that their identity would not be

linked to their responses. They were told that the purpose of the focus group was to learn about their experiences in the program and that their participation was voluntary.

Data Analytic Plan. Responses were transcribed and coded using the same procedure as for the student focus groups. Transcripts were coded for references to the three broad themes of GM training (technical skills, cultural skills, interpersonal skills), and for positive or negative valence. Below, we discuss the main findings. Quotes have been lightly edited for disfluencies, repetition and clarity.

Results: Application of Technical, Interpersonal, and Cultural Skills

Technical Skills. During the focus groups, students were asked to comment on their GM's competency in fulfilling basic job duties such as grading and providing feedback on their professional development assignments, such as their CVs, SOPs, and research assignments. Responses were generally positive regarding the GM's performance, but both students and GMs identified problems with the way that GMs were expected to apply grading rubrics created by faculty.

Providing feedback. Many students valued and appreciated the feedback that the GMs provided, recognizing that it was a lot of work to review multiple drafts of their assignments and a challenge to get detailed feedback from faculty members. One trainee said, *"I feel like they've been helpful, because I feel like if we just didn't have them, I'd be trying to get feedback from my TD, but they're extra super busy."* Another recognized the benefit of receiving individualized feedback that their GM gave them, saying, *"[they] would have good feedback for us, especially when we need to do a lot of things that prepare us for grad school like SOPs or IDPs, they would give us really good feedback and would also take into consideration what we've been through and what we're doing."* And when describing the process of revising multiple drafts of an essay, one student said, *"I would say they're essential when that occurs."*

Providing information and resources. Students also spoke positively of GMs 'ability to provide information and resources. Several reported that their GMs were helping them to research graduate schools and potential PhD mentors, as well as helping them to prepare application materials, some even sharing that their GM was better informed of their future goals than their faculty mentors, stating, *"My mentor's in a different field than what I want to get into and he doesn't know how to help me out with the application process or giving me resources. . ., whereas my GM does. She's bridging that gap."*

Facilitating breakout sessions. Students also spoke highly of the breakout sessions, which one described as *"where the real prep for grad school happens"*. Some wished for more breakout sessions, and they uniformly expressed a preference for breakout sessions led solely by GMs, as opposed to those where training directors participated. While the students viewed the GMs as a valuable asset in reviewing their assignments, providing detailed feedback, and facilitating

small group discussions, they did have issues with certain aspects of the course, especially grading.

There was a divergence between students 'evaluation of the qualitative feedback they received, and their evaluation of the quantitative scoring system. They appreciated the detailed comments GMs gave on their work; 90% of the comments on assignment feedback were positive (e.g., *"during the summer I felt like the GM was extremely helpful because I got very good, detailed feedback")*. This feedback was less essential at the Associates level, but became more important in the Scholars program, when they were preparing internship and graduate school applications.

Grading system. At the same time, students complained that the rubrics the GMs had to use for assigning numerical scores on their assignments were unfair, unclear, or overly rigid. As one student commented, *"the rubrics are very specific, but then also they don't necessarily make sense."* Some complained that GMs used the rubrics inconsistently: *"When I turned in the first draft, I got a 70-something, then I turned in the same thing and got an 80-something the second time."*

Different field. Furthermore, students questioned the ability of GMs from different academic backgrounds to understand certain assignments. The fact that natural science students often had GMs from behavioral graduate programs, and the diversity of majors among liberal arts students (such as Psychology, Linguistics, and Anthropology), meant that GMs were not necessarily familiar with field-specific conventions for their students 'professional materials. Students also noted that faculty were ultimately responsible for the course grade and felt that GMs were not always knowledgeable enough about faculty expectations for assignments. GMs concurred that they had difficulty interpreting how faculty wanted them to use the rubrics. *"I will grade off the rubrics and will dock those points, and then the training director will reach out to me and say why did you grade this person so harshly? Can you send me the rubric? And then they'll be like, oh, I wouldn't dock for this and this, even though the rubric says."* GMs also gave examples of different training directors interpreting the same rubric differently.

Issues with grading were also reflected in the GMs 'evaluation of the workshop they completed on grading SOPs, GMs (*N* = 16) rated the training with several questions on a scale of 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). They agreed most with the statement that the training helped them learn the importance of communicating with TDs in grading assignments (*M* = 6.3, *SD* = 1.1). They agreed less with the statements that the workshop helped them learn skills to grade SOPs (*M* = 5.57, *SD* = 1.19), provide helpful feedback (*M* = 5.73, *SD* = 1.0) and feel more prepared to grade SOPs (*M* = 5.47, *SD* = 1.25). Sixty-five percent of GMs believed that they need more training on how to grade SOPs.

Three questions in the student surveys related to technical skills (prompt return of feedback, prompt response to e-mails, and helpfulness of feedback). Each was measured on a Likert scale of 1-6, yielding a possible combined score range of 3-18. Independent samples *t*-tests revealed

a significant increase in satisfaction with the GMs 'technical competency, $t(196) = -2.70$, $p = .01$, from 2018 ($M = 15.82$) to 2019 ($M = 16.71$). In examining historically underrepresented minority (HURM) status, HURM students, but not non-HURM students, reported significant improvement in GMs 'technical skills competency, $t(87.92) = -3.20$, $p = .002$ from 2018 ($M = 15.41$) to 2019 ($M = 16.90$).

Interpersonal skills. *Approachability and Accessibility.* In regard to interpersonal skills, students emphasized their GMs 'approachability and accessibility, and the psychosocial support they provided. Students were comfortable e-mailing their GMs with questions about anything, whereas they found it intimidating to approach faculty (who were often perceived as too busy, and sometimes as judgmental). The breakout sessions, office hours and electronic communication made it easy for students to reach out to GMs whenever needed. As one student put it, *"I always know he's there if I needed him."* GMs concurred, claiming that students were more likely to turn to them than to faculty. *"I always am trying to let them know: you can come and talk to me, I care more about you than [I do about] BUILD. I just keep seeing that they're kind of scared to share with their mentor when they would share with me, because of the power difference."*

Psychosocial Support. Both students and GMs saw psychosocial support as a core part of the GMs 'role. Students reported that GMs created a sense of belonging and community. The breakout sessions were key to this, because they provided a forum where students could share their fears and bond with fellow students: *"You can cry to your GM, in a group even, and share things, and experiences"*. In fact, many of the breakout groups developed into supportive small communities. *"We've all formed a bond and with the GM, we are a little team,"* commented one student. Students cited GMs, and the sense of camaraderie within the GM-led breakout groups, as central to their sense of belonging in BUILD. One said, *"Do I feel part of the BUILD community? I'm not really sure. But I definitely feel like I'm a part of my breakout group community."*

The sense of belonging and community, as well as the ability to talk to GMs about negative feelings, helped students to manage stress. Students described venting, cursing, and crying to GMs. They saw GMs as sensitive to and concerned about their emotional and psychological states. As one commented, *"They'll ask like, how's your mental health? We just laughed at it, because we both know that it's not up there right now. But at least they know. They don't ridicule you, you can comfortably talk to them. If I tell that to my PI right now, he'd be like, that's not a joke. But he doesn't know, because it's been 20 years since he went through this whole process. He doesn't necessarily care, I guess."*

GMs identified psychosocial support as a personally satisfying aspect of their job, but also described it as challenging. GMs often struggled to cope with the aforementioned venting, cursing, and crying; some felt uncomfortable with emotional scenes. One GM described fear and shame as common emotions among students:

> *[Students] were so scared of being rejected by [graduate] programs that they don't want to apply at all. I get that, but I don't really know how to process that with them aside from just normalizing like, you can't really know anything about what's going to happen and the best you can do is try but I just don't think that's what they wanna hear. So I'm always stuck. I notice the fear among the elder cohorts because they're actually applying. I notice more like shame in the younger cohort, of like I'm not living up to some sense of myself that I think I should be living up to and so the shame feels a bit more relatable because I sit with that more often myself... what's familiar for me, I can address better but on what I don't actually experience much I'm like, I don't know what to do.*

Communication Skill. The students often viewed communications with the GMs positively, for example, one student said, *"She always responded super fast, and just makes a really easy way for me to get information without feeling kinda nervous about reaching out to the TD."* However, the GMs sometimes felt out of their depth, when they would spot potentially larger problems but be unsure what to do: *"Sometimes you can see red flags in people—where you know it's something that a counselor or someone who has more advanced communication skills will be able to tackle, but then it's hard to kind of relay that to somebody because [you don't have] evidence but just kind of a gut feeling."*

At the same time, GMs very much enjoyed the "life coach" aspect of their jobs. They found it fulfilling to see their students gain confidence. GMs felt that their near-peer status helped them related to students: *"It wasn't too long ago that I was in the same position. ... I understand the struggle talking to students about taking the GREs, I mean that it's not so far away that we don't know how the test works. We are near enough so we can sort of relate on those levels. So actually building a rapport with them, helping them, guiding them through. I was in their shoes when I was an undergrad."* Many GMs seemed acutely aware of their students 'feelings. They noticed ways in which BUILD inadvertently put students in embarrassing situations, such as when faculty asked publicly in seminars who got into programs, or when students had to enter graduate school acceptance data in the non-private setting of the BUILD center.

Both GMs and students described occasional problems with defining their interpersonal relationships. Some GMs reported that it was difficult to set the boundary between a mentorship relationship and a friendship, particularly because they were close in age to their mentees; one student mentioned inappropriate gossip. Some students raised issues concerning confidentiality, describing cases where a GM reported to faculty something told to them privately. A small number of students were hesitant to be open with their GMs for this reason. The newly instituted practice of having GMs meet with faculty mentors raised similar concerns; in cases where students were not included in the meetings, some perceived mentors as "talking about them behind their backs."

Student surveys found year-to-year improvement in GM's interpersonal skills. Four questions, each measured on a Likert scale of 1 (*Strongly Disagree*) to 6 (*Strongly Agree*), related to interpersonal skills, yielding a possible range of scores from 4-24. Independent samples *t*-tests revealed a positive trend towards significance in improvement of GMs 'interpersonal skills competency, $t(186) = -1.89$, $p = .06$, from 2018 ($M = 21.16$) to 2019 ($M = 22.15$). Once again, HURM students, but not non-HURM students, reported significant improvement in GMs ' interpersonal skills competency, $t(74.15) = -3.08$, $p = .003$ from 2018 ($M = 20.75$) to 2019 ($M = 22.66$).

Cultural skills. During the focus groups, students were specifically asked about their perceptions on their graduate mentors 'sensitivity to their cultural backgrounds and the backgrounds of other students in their group. Several students reported that they rarely, if ever, discussed cultural issues in their groups, and that cultural differences did not seem to be an issue. For example, one student said, *"all of the people in my group are Hispanic. Our graduate mentor isn't, but I don't think that gets in the way at all. I don't think there's a cultural barrier like 'oh, we're so different, we can't get through this together.'"* According to students, graduate mentors treated all students respectfully, regardless of their cultural background. In all the instances in which students expressed not seeing an issue in background differences, they seemed to be referring to interactions with graduate mentors in which they would be getting help in program-related activities, and, in their view, the difference in cultural background would not matter. One student said, *"I feel like our graduate mentor is pretty good at just doing his own thing professionally, without [taking into consideration] the context of cultural backgrounds, because all these things should apply across all cultures."*

Similar Background. However, when students identified sharing a similar background with their graduate mentor as an asset, they provided examples in which graduate mentors were able to help them because of the shared understanding of experiences. When addressing issues that could be influenced by culture, such as family commitment expectations, students appreciated having someone with similar background to talk to. One student shared, *"my graduate mentor is Mexican, we have to be very family oriented and so I had to move a meeting to take care of my cousins, and he was completely understanding."*

Gender. When discussing cultural backgrounds, students tended to adopt a broad definition of culture and diversity, emphasizing not only race and ethnicity but also socioeconomic status, first generation status, gender, and immigrant status, and highlighting the intersectionality of these different aspects of one's background. Many students in the program come from low-income families and some of the challenges they face relate to their financial struggles. Knowing that graduate mentors come from a similar background in terms of financial need has allowed students to be open up to graduate mentors about their circumstances and, according to students, their graduate mentors have helped them navigate this and find useful resources. For a few female students, having female mentors made them feel more comfortable when reaching out to them and talking to them. As one student described, the connection with all of her

graduate mentors (two female and one male) was good, but with the female graduate mentors she felt comfortable right away. For two students, having a mentor born in a different country, like them, made them feel more connected.

Similar Academic Field. Additionally, students often brought up the importance of their graduate mentors being familiar with or belonging to their academic disciplines. Those students that had graduate mentors in their same field saw it as a clear advantage, because they have already gone through the struggles that students are going through. As one student put it, *"having a graduate mentor who has a lot of knowledge of what I've gone through, in my field, is very useful"* and another student said, *"I feel like with all coming from our college, they know what your struggles might be, they've probably taken the same classes, so they can really relate to that."* Students who had graduate mentors in a different field had different opinions about the relevance of sharing this aspect with their graduate mentors. For some, as long as the graduate mentor was able to find the information that students need and was familiar enough with their field to be able to help them with graduate applications, belonging to the same discipline did not matter as much. For other students, belonging to a different field than their graduate mentors created obstacles and prevented students from interacting more with their graduate mentors. One student mentioned, *"sometimes [the graduate mentors] don't really get me, because I have a different major"*, while another student said, *"if I had a graduate mentor who was in my field specifically, I'd probably want to go more to them, and talk about their journey."*

For students, graduate mentors were particularly helpful in guiding them through unfamiliar academic territory. One student said, *"if your parents went to grad school, they can help you; but if you are the first person in your family to try to go to grad school, or even go to college, or graduate high school sometimes… that's where the graduate mentor really comes into play, because they can be that immediate access for you."* This is something that graduate mentors talked about extensively when during focus groups they were asked about what they enjoy the most about peer mentoring students. Graduate mentors emphasized their cultural connection to the students, helping them understand family dynamics and how they affect their academic careers. One graduate mentor explained that their parents question their career choices, mostly because their parents are unfamiliar with a research career. Another graduate mentor stated that some families may not be supportive of the research career. Because graduate mentors have gone through similar experiences with their families or are familiar with these cultural dynamics, they believe they are better prepared to support students in navigating these challenges. Additionally, graduate mentors believed that having similar backgrounds with students allowed them to increase their connection and improve interpersonal relationships.

Student survey results confirm that GMs were viewed as culturally competent and suggested that their skills slightly increased from 2018 to 2019. Four questions, each measured on a Likert scale of 1 (*Strongly Disagree*) to 6 (*Strongly Agree*), related to cultural competency. Scores on this 24-point scale were high in both 2018 (M = 21.89) and 2019 (M = 22.63). The year-to-year increase

in ratings is not quite significant for the full group of respondents ($t(171.44) = -1.75$, $p = .08$), but interestingly, it is significant for HURM students, whose ratings showed a slightly greater rise than non-HURM students from 2018 ($M = 21.73$) to 2019 ($M = 22.86$), $t(71.63) = -2.08$, $p = .04$.

In evaluating the cultural capital training they received, GMs rated the workshop higher on imparting theoretical knowledge than practical skills. On a 7-point Likert scale, the statements they agreed with most were that the workshop helped them learn more about cultural capital ($M = 6.22$, $SD = 0.67$) and its importance ($M = 6.22$, $SD = 0.97$). They scored the workshops lower on teaching ways to incorporate their knowledge of cultural capital when interacting with students ($M = 5.78$, $SD = 0.83$) and ways to apply growth mindset language when working with mentees ($M = 5.56$, $SD = 1.24$).

Results: Effects of the BUILD experience on the GMs

Although the purpose of BUILD is to help undergraduate students, it is worth noting that the GMs themselves are a group that shares many of the same characteristics as their trainees: they tend to be underrepresented students who aim to eventually earn a PhD. From 2015- 2019, CSULB has hired and trained 48 GMs across four colleges, out of which 34 completed their master's degree. Two GMs left their program without completing the degree and 12 GMs are currently enrolled at CSULB. Although the role of GM is demanding, expecting more than most graduate assistantships on campus, these outcomes indicate that participation in the BUILD program has not been detrimental to degree progress for the GMs. The two GMs who left their programs did so for reasons unrelated to their role as GMs. In fact, participation in BUILD can been seen as beneficial for many of the GM's career development, especially those who plan to apply to additional graduate or professional training. Out of the 34 GMs who have graduated, five were accepted to PhD programs and one was accepted to an MD program. Thus, a significant benefit of the BUILD program is the personal and professional development of the GMs, often in the same direction as the program hopes to effect with BUILD students.

While literature on mentor experience and the benefits of participating in peer mentoring is limited, a few studies have reported mentor gains in an academic setting. Among the benefits reported most commonly are personal and social outcomes (Beltman & Schaeben, 2012), while a few studies found professional and academic benefits. For example, in a study by Barker and Pitts (1997), graduate students reported that in mentoring undergraduate students, they found opportunities to develop leadership skills. Another study found "improved qualifications and career preparation, cognitive and socio-emotional growth, improved teaching and communication skills, and greater enjoyment of their own apprenticeship experience" in graduate students and postdoctoral fellows (Dolan & Johnson, 2009). Additionally, a study done with 81 graduate mentors reported "a deeper perspective both on themselves and their academic discipline; the development of advising and mentoring skills; contributing to the diversity of their academic and professional field; and knowledge that mentoring can assist both mentees and mentors in in reaching their goals" as four major professional benefits (Reddick et

al., 2012). In focus groups held with 16 GMs in spring 2018, GMs reported that the BUILD experience had benefitted them both professionally and psychosocially.

Academics. Based on information collected via focus groups with GMs, it is clear that working on the CSULB BUILD program helped GMs personally and professionally. GMs described the mentoring experience and the training they received as helpful to their own professional development. They explained that the grading experience was particularly helpful for their own academic progress. For example, when they submit an assignment for their courses, they reflect on how the assignment will be graded, which likely increases the quality of their work. They also expressed appreciating feedback from their professors more and even being more demanding of receiving feedback based on rubrics. Working for CSULB BUILD has also made GMs more aware of what kinds of help they needed to be successful in graduate school. For example, they have been more intentional in seeking out their own mentors, including the training directors, who, according to GMs, also support them in their professional development.

Professional Development. According to GMs, the training and instructions directed to undergraduate students also helped GMs improve their own PhD application materials, such as their CV and SOP, as well be better prepared for job or academic interviews. When asked what they learned through CSULB BUILD, a number of GMs brought up group communication skills, particularly facilitating discussions and public speaking. In addition, GMs reported that working in BUILD helped them understand what it takes to obtain a doctorate and the different aspects of pursuing an academic career (e.g. being a mentor). This allowed them to reflect more deeply about the career path they want to follow. For some GMs, this experience inspired or solidified their plans to earn a PhD themselves, while others came to realize that academia was not the right path for them. Finally, some GMs reported that, thanks to attending the CSULB BUILD professional development workshops, they realized they needed better preparation to apply for the PhD programs they sought. Some GMs expressed needing to approach the process more deliberately and take the time to decide what type of research they want to conduct and who they would want to work with.

On a psychosocial level, BUILD created a sense of belonging in GMs. *"The BUILD center is like my home on campus." "It feels like a team, when we are working together. I feel welcomed. And that my voice is heard."* One GM even described BUILD being the main reason why his experiences as an undergraduate and as a graduate student were so different at CSULB—he now has a sense of community that can be hard to find at a large university.

Leadership and Mentorship. Moreover, GMs also derived satisfaction from the rapport they built with mentees. Building relationships, learning about the students 'experiences, and supporting them through their journeys is what GMs enjoyed the most. However, GMs also mentioned experiencing stress when their mentees struggled.

Discussion and Conclusion

The primary goal of this paper was to describe the CSULB BUILD GM training component, including the GM training curriculum and present the evaluation of its effectiveness. In addition, we present the benefits for GMs in participating the GM training and the contributions of the GMs to the GM training curriculum and the larger undergraduate research training program.

Both formative and summative evaluations were conducted in the process of development and implementation of the GM training curriculum. In summary, the survey findings from undergraduate trainees show an increase in satisfaction with GMs 'technical skills and knowledge, interpersonal skills and cultural skills from 2018-2019. Additionally, trainee focus group results show that GMs were competent in meeting trainees 'career-related and psychosocial needs.

Evaluation results also informed the areas that need improvement in both GM training curriculum and student research training program. Specifically, undergraduate trainees and GMs identified grading expectations and rubrics as still being unclear, especially for writing assignments like the SOP and indicated they could be improved with better communication between training directors and GMs. This challenge is exacerbated when there is a mismatch in discipline between the GMs and trainees. To address this, we are currently testing a new approach whereby training directors and GMs collaboratively assign grades for the SOP and meet together with the trainee to provide feedback and explain the grading rationale. Additionally, undergraduate trainees expressed the need for more opportunities to get to know their GMs in the beginning of establishing their mentor-mentee relationship.

In evaluating the influence of the GMs on the students and on the research training program itself, there is a clear impact from having near-peer mentors within the large BUILD training structure. This benefit would not have been possible without two key elements that fostered support, creativity, and advocacy among the GMs. The two integral factors critical to the growth of this near-peer mentoring component were: 1) the responsiveness of the CSULB BUILD program leadership to the formative evaluation findings, and 2) the development of a training curriculum for the GMs. Additionally, it was key to the success of the GM training curriculum that the trainings were tailored and specifically to developing and fostering a) technical skills and knowledge, b) interpersonal skills, and c) cultural skills.

Recommendations for Practice

Based on the lessons learned during the design and implementation of the CSULB BUILD near-peer mentoring component, the following recommendations should help institutions considering implementing similar near-peer mentoring components for undergraduate research training programs. First, it is important to define the near-peer mentors 'roles early on. That is, identifying what near-peer mentoring means to the program; what near-peer mentors are expected to accomplish, and what should not be expected of them; and how the role of the near-peer mentors relates to the role of faculty and other leaders in the research training program and who

will supervise peer mentors 'work. Additionally, it is important to identify what near-peer mentoring components already exist on your campus, and what resources (such as joint training sessions) can be shared across programs. This will help establish the structure and goals of the near-peer mentoring components and will also help build the foundational base upon which the peer mentoring program stands.

Near-peer mentors are more likely to thrive when they have clear expectations. A detailed Memorandum of Understanding at the time of hiring is helpful in defining expectations for both sides (research training program leadership members and near-peer mentors). However, there can be a disconnect at times between knowing *what* to do and *how* to do what is expected, especially when the role is as ambiguous as mentoring. Therefore, there is a need to help the graduate mentors develop specific mentoring skills such as active listening, respect for confidentiality, helping mentees manage stress, etc. Appropriate training tailored to the demands of the specific program is essential.

In addition to tailoring the training, it is important to distribute the trainings over the academic semester and year. Spreading trainings throughout the year helps avoid overwhelming mentors with too much information at the beginning of the experience. Trainings can be intentionally placed within one semester versus the other. For example, we offer the technical and interpersonal trainings mainly in the fall semester when the GMs are fairly new to grading and are just getting to know their students. These are followed by the cultural training in the spring semester after the GMs and mentees have built trust and are able to have more in-depth conversations about identity and culture.

Another recommendation is to value and honor the experiences that the GMs bring to the undergraduate research training program. Near-peer mentors have the capacity to perceive and empathize with the needs of the students and are able to create foundations of support through their own innovation and resourcefulness. One such example is the "leadership project" which was introduced in Year 4 of the near-peer mentoring component. The goal of the leadership project was to allow better utilization of the experiences and strengths GMs bring to the research training program and create opportunities to value GMs as an integral part of the BUILD team. GMs were given opportunities to use part of their weekly office hours to identify the gaps that they had noticed in the research training program and prepare proposals to address those gaps. Their projects addressed a wide variety of needs. For example, one pair of GMs chose to hold weekly GRE study sessions for students, noticing that the mandated GRE prep lessons had not alleviated students 'anxiety about the test. Another pair focused on making the BUILD center more supportive and welcoming, decorating it with changing motivational quotes. One GM presented a talk on intersectionality and queer theory for BUILD leadership. Another planned an outreach event to families of BUILD students. Several students did data analysis projects on student success, in collaboration with the BUILD evaluation team. One GM created a binder of "before and after" anonymized CVs from previous students, comparing their accomplishments at the beginning and end of the research training program, as inspiration to incoming students.

GMs presented on their projects at an end-of-year event attended by BUILD leadership. The event was well-received, with faculty commenting that the GMs often perceived issues within BUILD that were less salient to faculty. The leadership project also helped GMs to "take ownership" of part of the BUILD program, and to feel that their perspectives were valued. By adding these contributions to the BUILD program, GMs used their unique position as a bridge between the undergraduate mentees and the BUILD leadership to create a more inclusive environment for the BUILD students. In creating these additional opportunities, we recommend paying attention to GMs 'workload so that they are not overwhelmed or distracted by the additional duties.

Lastly, from an empirical standpoint, it is important to systematically collect formative and summative evaluation data from all stakeholders to determine the effectiveness of these programs and to have the flexibility to make changes to improve them in an evidence-based manner.

Conclusion

The CSULB BUILD Graduate Mentor component adds value as one of the few near-peer mentoring programs that has been designed and implemented based on theory, evidence, and practice. While the literature on mentoring is vast, there is a dearth of information on exactly how to design and implement near-peer mentoring components within large undergraduate research training programs. This paper has addressed this gap by describing the entire process of creating and supporting a mentoring program from the design and development phase, to implementation, evaluation, adaptation, and finally back to evaluation. The iterative approach of these practices was grounded in mentoring literature, prior experiences as a GM, evidence gathered through evaluation, and was ultimately set in place to best support the GMs by providing them the tools and resources needed to support the students they serve in the BUILD program. By documenting these "lessons learned" along with the description of the history of this program, we hope the recommendations presented will aid other similar research training programs in increasing the retention of undergraduate students in science fields and supporting the goal of diversifying the scientific and academic community, through the impact of near-peer mentors.

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