

Internship to Improve Postsecondary Persistence for Students with Disabilities in the STEM Pipeline (Practice Brief)

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Abstract

Pacific Alliance project staff developed an internship program for postsecondary students with disabilities (SWD) in the science, technology, engineering, and mathematics (STEM) pipeline. The aim of the internship was to improve students' persistence in postsecondary education by improving their motivation, self-confidence, social and communication skills, and organizational and time management skills. In this practice brief, the authors describe the Pacific Alliance project housed at the Center on Disability Studies at the University of Hawaii at Manoa, its internship program, and the experiences of three interns as examples of successful outcomes of the Pacific Alliance internship program. The authors conclude with a discussion on the importance of one-on-one coaching and support beyond academics for SWD to succeed in the STEM pipeline.

Keywords: Internship, students with disabilities, STEM, persistence

Many colleges provide internship opportunities for their students to better prepare them for careers after graduation. Internships are often seen as a bridge between the academia and career (Amponsah, Milledzi, & Kwarteng, 2014). Such internship opportunities are beneficial to all students, including students with disabilities (SWD) (Briel & Getzel, 2001; Burgstahler, 2001; Shandra & Hogan, 2008). In a five-year database analysis of SWD who participated in bridge to work programs, Fabian, Lent, and Willis (1998) found that completion of internships, along with numbers of hours worked and days absent, predicted whether students were prepared to be employed upon graduation. Similarly, in their systematic review of literature, Test et al. (2009) found that paid internship was one of the predictors of employment for SWD with a moderate level of evidence ranging from small to large effect size. In their study, Rabren, Eaves, Dunn, and Darch (2013) found that both education and training are important during the transition from postsecondary education to employment. They also noted that education and training influenced SWDs' satisfaction with the postsecondary education experience; so in addition to the aforementioned ben-

efit of increasing the likelihood of employment for SWD after graduation, other benefits of internships for SWD include improving academic performance, motivation, and self-confidence, as well as assisting in their understanding of disability-related needs.

Burgstahler and Bellman (2009) conducted a study of participants in DO-IT (Disabilities, Opportunities, Internetworking and Technology at the University of Washington), which provides work-based opportunities for high school and college SWD in the STEM fields. The participants, who were involved in an internship between 2002 and 2008, were asked about perceived benefits of internships on career-related attitudes, knowledge, and skills. Sixty students (20 high school and 40 college) responded to the survey. According to survey results, all respondents—regardless of disability, gender, or education level—indicated that participating in their internship increased their motivation to study and work toward a career. Participants also reported learning communication and problem-solving skills, how to work with other individuals, the operations of the organization, and about building self-confidence through their internship experience.

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Although researchers agree that activities to support and encourage employment—such as internships—are necessary to help SWD find employment upon graduation, there is need to strengthen support between local education agencies, institutions of higher education, state development disability authorities, and state vocational rehabilitation services and SWD in higher education, (Butler, Sheppard-Jones, Whaley, Harrison, & Osness, 2016). Briel and Getzel (2001) identified effective strategies used to support SWD participating in Virginia Commonwealth University (VCU) internship programs, which provide internship opportunities for SWD as part of their supported education model (Getzel, McManus, & Briel, 2004). These support strategies include: modeling the task and having students immediately repeat the same task; assisting students to break large tasks into smaller tasks; role-playing leadership activities; role-playing social interactions; identifying stress management strategies; providing direct feedback to the students; and having students write out processes step-by-step before completing tasks. In addition to support strategies, the authors found that support through one-on-one coaching on matters such as how to communicate effectively with supervisors, master specific job skills, and address issues of disclosure of disability and work accommodations enhanced the internship experience for their VCU participants.

Depiction of the Problem

Pacific Alliance Project

To broaden participation of individuals with disabilities in postsecondary STEM education and the workforce, the Center on Disability Studies at the University of Hawaii at Manoa was awarded a five-year grant through the National Science Foundation (HRD #09-29079) and implemented the Pacific Alliance project. One approach to increase the number of SWD in STEM postsecondary education programs and ultimately careers in STEM was to provide internship opportunities for SWD.

During the first four years of the five-year Pacific Alliance project, the project was highly successful in transitioning high school project participants into postsecondary education through mentoring and academic support. This success is in line with the increased number of SWD attending postsecondary education (Newman et al., 2011). However, once the students were in a postsecondary program, most were unsuccessful in gaining internship opportunities—a key predictor for employment success for SWD. In fact, of the 136 student participants who transitioned from high school to college through the Pacific Alli-

ance program, only two students sought an internship in the STEM fields. Participants who were interested in an internship but did not apply for or follow-through with an internship indicated various reasons for not pursuing an internship, including their lower grade point average, part-time student status, and number of credit hours; however, the one common reason for not pursuing an internship was their lack of confidence in applying for a STEM internship. Thus, the Pacific Alliance Internship was created as a steppingstone to foster students' motivation and confidence to work in the STEM fields by providing students with internship opportunities and addressing the development of soft skills—such as social and communication skills, and organizational and time management skills—deemed necessary for employment post-graduation.

Participant Demographics and Institutional Partners/Resources

Over the five years of the Pacific Alliance project, 394 SWD from 17 high schools and five colleges on Oahu, Hawaii participated in Pacific Alliance. Of the 394 participants, 162 students were high school participants and 232 were college participants. Of those students who reported their disability type ($N=322$), the most common disability was a learning disability (24%), followed by ADD/ADHD (24%), other (13%), and Autism Spectrum Disorder (11%). Participants were also ethnically and racially diverse with 41% of the participants reported as Native Hawaiian or Pacific Islander, 37% White, 19% Asian, 12% Hispanic, and 7% American Indian/Alaskan Native ($N=308$). With regard to gender, 37% of the participants were women and 63% were men ($N=308$).

As a summary of the project effects, the project successfully supported 136 high school students with disabilities to transition into postsecondary students, and 117 students out of the 136 (86%) particularly transitioned into STEM programs. When comparing college participants who participated in the project during the first two years of their postsecondary studies and those who did not participate their first two years, those who participated accumulated more STEM and general credits and were more likely to have continuous enrollment across four semesters (Park, Takahashi, & Roberts, April 2015).

Description of Practice

Pacific Alliance Internship

One component of the Pacific Alliance project was to provide career support to participating students with an internship opportunity. In addition to

connecting students with outside STEM-related employment or research internships, the Pacific Alliance offered its own internship stipend program to provide college participants a competitive opportunity in a supported and safe environment to improve motivation, self-confidence, social and communication skills, and organizational and time management skills. The goals of the Pacific Alliance internship program were to: (1) increase and improve interns' communication skills, (2) increase interns' confidence by providing duties and expectations in a professional work setting, and (3) increase interns' self-determination and persistence in completing their degree program. The role of the interns was to be the Pacific Alliance representative, a project liaison for students and faculty, for his/her respective college campus. By creating a career-learning environment and providing participants with opportunities to interact with their peers with disabilities and STEM faculty on their college campuses, the Pacific Alliance Internship program projected increasing the students' persistence in postsecondary education (Deil-Amen, 2011; Mamiseishvili & Koch, 2011).

Recruitment. Pacific Alliance staff contacted via email all current college participants who had already participated in the Pacific Alliance project for at least one full semester and invited them to apply for the internship. Interested participants were required to complete an internship application, as well as write an essay about why they want to be a Pacific Alliance Intern at their college campus, and how the internship will help them with their current and future endeavors in the STEM field. After receiving and reviewing the applications, Pacific Alliance staff then interviewed prospective candidates. All applications, essays, and interviews were scored on a rubric. Based on their scores, a maximum of four interns from different college campuses within the state system of colleges were selected for one academic semester. In total, 11 students became Pacific Alliance Interns over the three semesters that the Pacific Alliance Internship program was implemented.

Internship participants. The eleven student interns included six males and five females. They were asked to report all the races they have: six of the interns reported they were Asian, three reported Native Hawaiian/Other Pacific Islander, five reported White, and two reported Hispanic. They were also asked to report all of their disabilities: four reported Autism Spectrum Disorder/Asperger's Syndrome, two reported Attention Deficit Hyperactivity Disorder, three reported systematic health disorder, three reported psychological disorder, two reported learning disorder, and one reported visual impairment.

Tasks and responsibilities. The interns' main responsibilities were to provide support by acting as role models for their postsecondary education peers with disabilities, to recruit other SWD to the Pacific Alliance project, and to assist Pacific Alliance project staff with planning and facilitating special events, such as academic camps and conferences. The Pacific Alliance Internship Orientation Handbook outlines the following as general expectations of a Pacific Alliance Intern. Each Pacific Alliance Intern is expected to meet the following: (1) Work a minimum of eight hours per week for one semester (or agreed upon time frame); (2) Attend an Intern orientation; (3) Participate in Communities of Practice (COP) meetings on their college campus; (4) Assist and attend Pacific Alliance high school sessions; (5) Assist and attend Pacific Alliance special events (e.g., Pacific Rim International Conference on Disability and Diversity, The Pacific Alliance Winter/Summer Institute for High School Students, The Pacific Alliance Winter/Summer Institute for College Students, The Pacific Alliance Math Camp, The Pacific Alliance Reading and Writing Camp); (6) Hold monthly information sessions about Pacific Alliance on their college campus; (7) Attend a face-to-face monthly meeting with Pacific Alliance staff and other Pacific Alliance Interns; (8) Meet virtually (e.g., phone, chat, Skype, Blackboard Collaborate) with other Pacific Alliance Interns twice a month; (9) Work on holidays and/or weekends as needed; (10) Accurately keep track of and record Internship hours; (11) Enter weekly hours and a description of activities on the provided software program; (12) Assist in organizing speakers and role models for events and/or meetings; (13) Provide campus guided tours of their campus; (14) Fill out necessary paperwork including a final report/survey about their Internship experience.

Orientation and training. As indicated in the expectations above, the interns had various tasks, which required different skills; therefore, Pacific Alliance staff facilitated a four-hour orientation and training, which took place over the course of two days, to review these tasks with the interns. The training and orientation session used a project-developed internship orientation handbook to introduce the interns to the Pacific Alliance Internship program and outline their tasks and responsibilities as interns. The orientation covered the following topics: (1) About Pacific Alliance Project; (2) Critical Junctures for Students with Disabilities and Laws and Regulations; (3) General Expectations of a Pacific Alliance Intern; (4) Managing Time and Stress Levels; (5) Professionalism; (6) Confidentiality; (7) Teamwork; (8) Communities of Practice; (9) Mentorship; and (10) Internship

Log and Reporting. Pacific Alliance staff also provided the interns with ongoing informal trainings throughout the semester on organization, leadership, and communication. Both the formal and informal trainings included opportunities for the interns to practice skills—such as responding to questions about the project, telephone etiquette, presenting in front of an audience, approaching STEM faculty, and interacting, tutoring, and mentoring other SWD in the project—necessary to complete their internship tasks.

Coaching. In order to build additional rapport between the interns and the project team, Pacific Alliance staff paired with interns to provide one-on-one coaching as advisors. Advisors monitored interns' workload and stress levels, including how they were coping with the rigors of exams, papers, and classroom demands along with their internship responsibilities.

Evaluation of Observed Outcomes: Cases

At the beginning of the internship, most of the interns said they had trouble with time management and organization skills. Some of them expressed anxiety with interacting with other students. They also expressed that they were unsure of whether they could complete the internship. However, commonly across cases, throughout the internship, they showed improvement in their leadership skills, social confidence, and social skills, organizational and time management skills and determination to persist in postsecondary education. The outcomes of the Pacific Alliance Internship program are illustrated through three cases. The internship experiences of these three interns varied by: when they became a Pacific Alliance participant (i.e., at high school, community college, or a four-year university); the stage of postsecondary education they were at when beginning the internship (e.g., community college or a four-year university); types of disabilities; and individual maturity levels.

Spencer

Spencer (all names are pseudonyms) has Asperger's, an Autism Spectrum Disorder. He had successfully transitioned from community college to the University of Hawaii at Manoa and was learning to live on his own at the time of this internship. Although he was aware of college resources—such as the disability services office—that could help him persist with his college education, Spencer was often forgetful and had a State mental health provider to ensure that he remembered to utilize the campus supports and resources available to him.

Spencer joined the Pacific Alliance project as a high school senior and continued as a college participant. As a college student, he wanted to become a Pacific Alliance intern to “help get people into the STEM fields.” He felt that he could be a good role model of going to college for others with autism. At the beginning of Spencer's internship, he struggled with time management and needed frequent reminders about coming to work. He also had difficulty maintaining eye contact and having casual interactions with peers and faculty he spoke to about Pacific Alliance, but was able to answer questions about the project when asked and could carry on the conversation from there. At the end of the internship, Spencer reflected that he could now maintain eye contact and respond more naturally when interacting and conversing with others.

Although he was apprehensive at first about how he would be able to balance school and work as he had never had a “real” job before, as well as working with others involved with the project, Spencer reported that the internship program helped him grow and develop in many ways, such as strengthening his ability to work in a team, developing his leadership and social skills, managing his time better, and overcoming obstacles that would have previously prevented him from working as an intern. In his post-internship reflection essay, Spencer stated that “the internship gave me a chance to experience a working environment firsthand. I feel more confident that I can accomplish tasks in a working environment.” He also explained that before the internship he felt that he would be easily overwhelmed and upset with the demands of the internship and would be unable to control his feelings. At the end of the internship, Spencer reported that he learned to cope with “trouble or distractions” that arose in the workplace and that he felt confident that he was responding appropriately to those troubles or distractions.

Spencer's pre-post internship survey results aligned with his reflection. His response improved from “below average” (pre-survey) to “average” (post-survey) for the question, “Skills needed to advocate for the needs of students with disabilities in postsecondary education,” and improved from “average” (pre-survey) to “excellent” (post-survey) for teamwork skills, communication skills, and work ethic. Spencer is still enrolled in the university and is pursuing a degree in computer science.

Josie

Josie reported having ADHD. She was a transfer student to the University of Hawaii at Manoa and, at the time of becoming a Pacific Alliance participant,

she struggled with her higher-level science courses. She participated in the Pacific Alliance project for one year prior to becoming an intern during her junior year at the university. Josie applied to be a Pacific Alliance Intern because she believed that the tutoring, mentoring, online resources, and stipends provided through the Pacific Alliance project would help her and others improve her academic performance and GPA. She stated in her application essay that “if more students knew that help was readily available on campus, more freshman and sophomores would feel capable of declaring a STEM major.” Thus, as an intern, she posted flyers about Pacific Alliance opportunities around campus and talked to her department about the Pacific Alliance project to let others know of help provided through the Pacific Alliance project. Josie also acted as a role model for perspective STEM students by meeting with high school participants and talking about how she chose Biology as her major. She even created and delivered a poster presentation on Polymerase Chain Reaction (PCR) to demonstrate what she studies in her STEM field. Josie shared that researching, organizing, and reviewing techniques and procedures on PCR for her Pacific Alliance poster presentation actually helped her studies as it aided in her success at the reproductive biology lab and helped her complete the required directed research credit for her Biology degree.

Upon reflecting on her internship experience, Josie realized that the internship helped to enhance her resume, increased the competitiveness of her academic profile, and will improve her prospects of gaining admission to the Genetic Counseling Master’s program. Also, working with other SWD helped her become more patient and understanding, and helped strengthen her organization and time management skills, and her ability to work with others. Furthermore, participating as an intern gave Josie the confidence to manage working part time while enrolled as a full-time student, continuing her directed research at the reproductive biology lab, and teaching interns for the introductory genetics course. Since participation in the internship, Josie has successfully graduated with a Bachelor of Science degree in Marine Biology and applied to graduate school.

Kainoa

Kainoa is an older, non-traditional student who reported his disability as autism. He studied ethnopharmacognosy at one of the community colleges. He was a Pacific Alliance participant for just one semester before applying for the internship. From the internship, Kainoa wanted to: (1) learn about assistive technology; (2) increase his opportunities in STEM fields; and (3) develop communication skills

and build self-confidence. Through the internship, Kainoa engaged well with high school SWD. He helped facilitate high school sessions with Pacific Alliance staff and introduced students to ethnopharmacognosy through presentations. He also held information booths on his college campus to disseminate information on Pacific Alliance, and delivered a poster presentation about the project at the Pacific Rim International Conference on Disability and Diversity.

In his post-internship reflection essay, Kainoa shared that participating in high school sessions, presentations, and conferences about topics he was familiar with helped him become comfortable with talking and connecting with people, gave him opportunity to practice teaching, and gave him confidence in his choice of study. At the beginning of the internship, Kainoa self-assessed his communication skills as “average,” but at the end, he marked his communication skills as “above average.” Kainoa also wrote that he learned organizational skills and time management. In addition, he shared that having the internship commitment helped him to push forward and overcome a personal life event that he had been struggling to get through. He has since graduated from community college and was accepted to the Department of Plant and Environmental Protection Sciences program at the University of Hawaii at Manoa.

Implications and Portability

Providing a guided internship opportunity can help postsecondary SWD in the STEM pipeline develop their motivation, self-confidence, social and communication skills, and organizational and time management skills. Similar to the findings of Burgstahler and Bellman’s (2009) interns, the Pacific Alliance interns reported that they improved their communication skills and built self-confidence through their internship opportunities. In addition, the interns unanimously expressed their growth in social interactions while also indicating that they came to be more active in seeking support to help persist with their college and internship experiences. The Pacific Alliance internship program’s one-on-one coaching, modeled after the VCU internship program (Briel & Getzel, 2001), contributed to the success of the internship program as it created a supportive environment for the interns and allowed the project staff to build relationships with them. Furthermore, as may be seen from the outcomes of the three cases described above, the interns’ positive experiences with and skills gained from their internships have contributed to their persistence in their pursuit of a postsecondary education degree.

Eight other student interns, who were not highlighted in this article, also made successful transitions to postsecondary STEM studies with project support. Three students began participating in the project in high school, entered a community college, and graduated with a STEM degree; three students began while they were at a community college and made a transition to a four-year university STEM program; and two students began and are continuing their STEM study at a community college.

Although the Pacific Alliance Internship program was successful, there were also challenges to implementing it. Many of the Pacific Alliance participants were hesitant to apply for the internship because they doubted they could juggle the internship commitments successfully while already struggling with the demands of postsecondary education. Therefore, even when they are aware of the benefits of internships, SWD may still need additional encouragement to apply for internship opportunities. Thus, the participants who apply for internships are probably the students who are more likely to persist in the postsecondary education over those who do not apply. Another challenge for the project was staffing. Having the one-on-one coaching was crucial to the internship program, but it would not be feasible if there were insufficient staff to facilitate the one-on-one coaching with an increased number of interns.

While the Pacific Alliance Internship program was very successful, and continues to operate even after the project's lifespan, it is important to investigate institutionalization of the promising supports that were provided. Internships like the one created by the Pacific Alliance project should be integrated within existing services on all college campuses. For example, the disability services can create an internship program for students registered with the office. Interns can assist with proctoring tests, arranging for note-takers, converting written text into electronic text, holding a booth about the disability services, and talking to faculty about the disability services available for SWD. Through these internship opportunities, SWD in postsecondary education can improve communication, social, and job-related skills, and gain the self-confidence necessary to persist with their education and secure employment in the workforce upon graduation.

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