While many of the families in the study reported positive experiences with schools, teachers, and service providers, our students also learned best practices from parental reports of negative experiences. The results of this study demonstrated overwhelmingly that families value communication, understanding, support systems, and non-academic experiences as part of the collaboration between families and schools.

Each student's case study highlighted the strengths, needs, challenges, hopes, and the fears of each family. Their findings were authentic, multifaceted, intimate, and holistic. As Donlevy (2001, 8) has said, "In special education, the most significant variables have little to do with curriculum details and mandated exams; they have everything to do with the lived experience of important human relationships." This means building a relationship of trust between the student, the parent, and the teacher for every child. Special education is a dynamic and diverse field, and professionals, teachers, students, and parents are desperately seeking best practices to meet the needs of those with disabilities. We hope the collaborative efforts of our education students are helping to fill voids in the research, discourse, and practices that in due course will benefit children with disabilities and their families.

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A Distributed REU Site Focused on Serving Physics and Astronomy Students from Comprehensive and Community Colleges

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This project sought to provide students with their first faculty-mentored research experience. The principal difference between this National Science Foundation (NSF) Research Experiences for Undergraduates (REU) initiative and the more traditional, single-campus physics and astronomy REU is that our program used a distributed model with students conducting their research at different institutions across the nation. Seven universities participated in hosting REU students during the program, including Central Washington University (CWU), College of Charleston, Embry Riddle Aeronautical University, SUNY-Geneseo, University of Wisconsin-La Crosse, Weber State University, and Wright State University.

The CUR Physics and Astronomy (CURPA) Division's distributed REU had some features that resemble those found in a traditional, single-institution REU and others that are not.

1. As with a traditional REU, the CURPA program featured faculty mentors who were seasoned researchers. Most had significant experience mentoring undergraduates, including students in their early years of college. Faculty members without prior mentoring experience were coached by experienced faculty.
2. CURPA REU undergraduates joined two learning communities: other students in the CURPA REU cohort and students at each host site supported by other programs. Thus all CURPA students had on-campus peers with whom they could work and interact. CURPA REU students "networked" with one another electronically throughout the summer, in much the same way that today's large-scale research groups communicate (e.g., webinars and email). All CURPA students participated in an end-of-summer, face-to-face multiday networking experience at the principal investigator's campus, Central Washington University, an activity identified by other programs as necessary and important (Hubenthal and Judge 2013).
3. Participants received feedback from their immediate supervisor and from the broad array of faculty and students participating in the project. This exposed partic-

ipants to individuals with a diverse range of physics and astronomy sub-disciplinary knowledge and skills.

4. Colleges report that about one-third to one-half of undergraduates change their majors at least once (Foraker 2012). Through webinars, informal discussions with faculty mentors and peers, the CURPA REU program provided formative experiences, generally early in participants' academic careers, that will assist them in making better-informed decisions earlier in their undergraduate years.
5. CURPA REU students, who generally came from smaller schools, had the opportunity to pursue a research experience at an institution with a relatively similar academic and "community" environment.
6. By using CURPA councilors and faculty members, students had access to a diverse range of disciplinary expertise and research topics. Additional mentors could also be readily recruited to accommodate a greater number of participants.
7. The project benefitted from collaboration with the CUR National Office for assistance with recruiting through the NSF-funded Community College Undergraduate Research Initiative (CCURI) (Hensel and Ambos 2011; Hewlett et al. 2011).

NSF's Division of Physics funded the CURPA REU as a two-year pilot for six students in each summer. Additional support from the Washington Space Grant Consortium and CURPA enabled the project to support an additional student each summer. The program's two-year student demographics included six males and eight females with students identifying themselves as Hispanic (2), African-American (1), Asian (2), and Caucasian (9). Two students identified themselves as veterans. Of the 14 participants, eight were first-generation college students. Two of the program's undergraduates were rising seniors, eleven were rising juniors, and one was a rising sophomore. Four students were from community colleges, five students were from comprehensive institutions, and five students were from research institutions.

The format used by our REU each summer was:

Week 1: Participants traveled to their respective host institutions and were introduced to the campus, work place, and that university's cohort of summer research students. Participants completed training in safety and in responsible conduct of research and developed a work plan with their research mentor*. This work plan facilitated the discussion

of expectations between the student and mentor, outlined what research was to be accomplished, established a deliverables timeline, and enabled mentors to provide a context for how the student's work fit into the bigger scientific picture.

Weeks 1 – 9: Students conducted their research. To promote communication among the REU cohort and engage members as a learning community, participants interacted through weekly webinars, with additional interactions available through other mechanisms (e.g., Canvas, the course-management program used for the program). Several students wrote weekly research blogs using WordPress' *Undergraduate Research Reports*.

During weekly webinars, students interacted with practicing physicists and astronomers, discussed their research projects, and participated in a number of targeted activities such as the American Institute of Physics' Careers Toolbox (AIP Career Pathways Project 2015).

Week 10: Students and PIs traveled to an end-of-summer meeting at Central Washington University to finalize the students' deliverables (i.e., presentations, written reports, assessment of the program). This five-day event also provided participants with a bonding experience that included activities and field trips (e.g., a visit to the Laser Interferometer Gravitational Wave Interferometer in Richland, Washington).

Research Projects and Products

Research projects were designed and developed by mentors to advance students' fundamental knowledge within the discipline and to provide them with an opportunity to engage in research and make meaningful contributions to the investigation. The research performed by REU participants was either experimental or computational and represented a diverse array of physics and astronomy subfields (e.g., Properties of Cu doped ZnO thin films grown by spray pyrolysis, A search for pulsations in the sdB star EC20117-4014, etc). These projects also introduced students to the scientific literature, ethical conduct of research, and procedures for oral and written scientific presentations.

During the first year of the project, the students' work resulted in one peer-reviewed manuscript published in a professional journal (Jackson et al. 2015), with a second manuscript in preparation. Three presentations were made by the REU students at NCUR, with two additional presentations made at local/regional meetings. Two students received local awards for their research. Four of the students participated in a second research experience the following summer.

To address NSF reviewers' concern that the CURPA model

might lead participants to feel isolated, the PIs and faculty at the host institutions implemented several measures:

1. A mechanism was put in place that enabled the REU participants to regularly communicate with one another through Canvas.
2. Ice-breaker and collaborative/competitive activities were conducted throughout the summer at the host sites.
3. As noted, a final face-to-face meeting was hosted at CWU, and field trips were funded using non-NSF funds from CURPA and CWU.
4. The PIs communicated at least weekly with the REU students, providing program updates and feedback.

Evidence that these measures were effective in addressing isolation can be found in the students' exit surveys. Asked what elements of the REU had the greatest impact or benefit, the fourteen participants of the program listed:

- "Social interactions with Mentor at the Host Institution" (mentioned 12 times),
- "Social interactions with Students at the Host Institution" (9 times), and
- "End-of-the-summer activity at Central Washington University" (9 times).

One student described her interactions with the REU faculty and students as the "best part of the research experience."

Seven of the fourteen participants entered the summer research interested in obtaining a PhD. By the end of the summer, 11 of the 14 students (79 percent) indicated such an interest. Although the desire to pursue a doctoral degree is neither the focus of our program nor necessarily an indicator of its success, it is indicative of students' increased confidence in their ability to perform research. It also suggests that a distributed REU is as effective in building students' confidence in their ability to do graduate-level work as is the more traditional single-campus REU.

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*A listing of Fermilab's summer research programs, along with information for both mentors and participants, can be found at <http://ed.fnal.gov/interns/programs/> (retrieved August 3, 2015).

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Research Collaboration Creates Opportunities for High-Impact Undergraduate Research

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It is well known that authentic undergraduate research contributes to positive student growth by developing students' disciplinary knowledge, general critical-thinking skills, and broader career plans. In our disciplinary field, psychology, providing such high-impact experiences can be a challenge, particularly at smaller institutions with potentially limited access to resources such as appropriate study populations and technological expertise. Over 15 years, however, we have maintained an active collaboration—author Oakes at the University of California Davis and author Ellis at Grinnell College—investigating early development of cognition in infants and toddlers. We collaboratively—and often with our students—develop research questions, design experimental procedures, and create study materials. We collect and analyze data at both institutions, typically combining our efforts in presentations at conferences and published manuscripts.