

Navigating Dual Roles: Challenges, Impacts, and Resource Needs of Student-Parents in Engineering Programs

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Introduction

Student-parents embody a unique and growing demographic in higher education, balancing the roles of caregiver and student with determination. Over a quarter of all undergraduate students are student parents, and almost half of all undergraduate student-parents are enrolled in community colleges (Noll et al., 2017). Additionally, 35.5% of master's program students, and 28.4% of doctoral program students (National Center for Education Statistics, 2010) in the United States are parents. For these individuals, education is both a personal and family investment, offering pathways to economic mobility and improved health. However, their dual roles often come with big challenges, particularly in fields like engineering, where academic demands are notably rigorous. The intersection of these roles – parent and student – raises critical questions about how institutions can better support this population, whose success has implications far beyond individual achievement.

The journey of a student-parent is unlike that of their peers. Time is insufficient, resources are stretched, and the stakes are high – not just for themselves but for the future of their children. Their motivations to persist are powerful, driven by the promise of better opportunities. Yet, the obstacles they face often undermine their aspirations. In engineering programs, where time-intensive coursework and high expectations are the norm, these challenges become even more serious. This reality highlights an urgent need to understand the specific barriers they face and the resources they rely on – or struggle to access – in navigating their educational journeys. In this way, Lesener et al.'s (2020) framework on the balance of demands and resources is a promising lens through which institutions can better understand ways to create and administer resources for this population.

Despite their growing numbers and unique needs, the experiences of student-parents in higher education remain underexplored, particularly in demanding disciplines like engineering. While studies address general issues like role conflict (Engelhard 2013, Dolson 2020), little is known about the unique barriers faced by student-parents in engineering programs, how these challenges affect their mental health and academic performance, or what resources they find most beneficial.

This study focuses on graduate-level student-parents at a large public research university in the United States, a context that offers both the diversity and scale needed to explore these issues. The study unfolds in two phases. Phase I employs a mixed-methods approach, combining qualitative and quantitative data collection through surveys distributed to undergraduate and graduate student-parents. These surveys seek to capture their most pressing challenges, evaluate how they engage with campus and external resources, and explore their views on the accessibility and effectiveness of these supports. As a work-in-progress paper, this study aims to complete the pilot portion of Phase I. Insights from this pilot study will inform the development of the final survey for the first phase. At the end of Phase I, the results will aid in the development of an interview protocol for Phase II. This phase will explore deeper into their lived experiences, focusing on barriers to resource utilization and their recommendations for improvement. To guide this work, we pose the following research questions:

RQ1: What are the primary challenges faced by student-parents in balancing their academic and parental responsibilities?

RQ2: How do parental responsibilities influence the academic performance and mental health of student-parents in engineering programs?

RQ3: How do student-parents perceive the adequacy and accessibility of campus resources available for them?

RQ4: What additional resources or policy changes do student-parents believe would help them succeed in their engineering studies?

By understanding the interplay between challenges and support systems, we hope to identify actionable strategies to improve student-parents' academic and personal outcomes. The findings will contribute to the broader conversation about student resources for different populations in education and help engineering programs create environments where student-parents can thrive.

Literature Review

Among the most prevalent concerns in recent research are student parents' increased insecurity around basic needs such as housing and food. Student parents are more likely to have reported struggling to afford basic necessities in the last three months compared to students without children (Dundar, Tighe, and Turner 2023). Doorley et al. (2023) outlines that while many student parents may qualify for social need programs, many of these programs have strict work requirements that commonly do not consider college coursework to count towards work hours. One study also showed that as low as 8% of all universities in the United States have on-campus housing for families (Green, 2020). Sallee et al. (2024) highlighted how food insecurity on one college campus was handled with only the assistance of private funds or single endowments of funds gathered from student fees. Additionally, there seem to be misconceptions from academic staff about students' awareness of basic needs programs (Manze et al., 2024), which might cause administrators to forgo reminding students about the resources that students in need may have access to.

The field of study regarding student-parents benefits from increased attention in recent years. Common topics within this sphere emphasize the interrelatedness of support measures for student parents and student parent success, which helped inform the study's choice in theoretical framework and ultimate focus on how student-parents interact with and perceive their institutions' resources.

Theoretical Framework

We employed the study demands-resources (SD-R) framework (Lesener et al., 2020) and study demands-resources theory (Bakker & Mostert, 2024). This framework, adapted from the job demands-resources model in occupational psychology (Bakker & Demerouti, 2017), posits that student experiences consist of study demands and study resources. Study demands, such as mental effort and multitasking, are linked to burnout and decreased well-being, while study resources, such as teacher and peer support, enhance engagement and well-being (Lesener et al., 2020). Study demands represent the challenges of studying, including concentration, social demands, and personal pressures (Salmela-Aro et al., 2022). Conversely, study resources are positive elements like student support, teacher support, and developmental opportunities, which foster career growth and learning (Lesener et al., 2020).

Although the SD-R framework has been widely studied, its application to student-parents remains unexplored. Student-parents face unique demands and require specific resources distinct from non-parenting peers. As both students and caregivers, their dual roles present distinct challenges and opportunities for applying this framework. This study aims to answer the call by Salmela-Aro et al (2022), who helped to develop the conceptualization of student resources more recently. They call for

examining “the dynamic process of engagement and the dynamic interplay between environmental and individual factors” (Salmela-Aro et al., 2022, p. 88). This study aims to understand a specific environment and individual set of factors which are unique to students who have parenting responsibilities.

Survey Design

A survey, approved by the Institutional Review Board (IRB) of Virginia Tech, was distributed to participants over 18 years old, who received an information sheet before participation. Using the SD-R framework, we identified potential demands faced by student-parents, drawing on team members’ experiences, including those of a student-parent. This pilot version of the survey was implemented by the study team, with some aid in identifying resources from student success centers on campus. The framework’s categories of “challenging study demands” and “time pressure” (Lesener et al., 2020) were expanded to include additional demands detailed in Table 1, though connections to specific roles were excluded to avoid bias. Participants rated the impact of each demand on a scale from “Not at all” to “Nearly Every Day” and could suggest additional demands they encounter.

The survey included a comprehensive list of demands commonly faced by student-parents, highlighting the dual pressures of managing both academic and parenting responsibilities. These demands include time balancing (TB), financial strain (FS), emotional and physical fatigue (EPT), limited support networks (LSN), and limited time for networking (LTN). Student-parents also navigate challenges like access to affordable childcare (AC), maintaining work-life boundaries (WLB), lack of academic program flexibility (LPF), mental load (ML), career uncertainty (CU), social isolation (SI), and mismatches in school and life schedules (SLSM). Each of these factors underscores the complex interplay between their roles as students and parents, with childcare challenges being uniquely tied to their parenting responsibilities.

Participants were then asked to identify their resource usage. First, we identified resources which were focused on their student role, outlined in Table 2. Participants indicated the frequency of usage for each category as “Never heard of it”, “Heard of it but never used it”, “Used it once or twice”, “I use it multiple times a semester”, “I use it every week”, and “I use it nearly every day”. The same scale was used to indicate usage of resources related to their parental role, including on campus daycare programs, support groups, and off campus childcare centers. Participants were also invited to share any resources which were not mentioned in the questions about student resources and parental resources.

The survey also included a range of resources available to student-parents, categorized by their role as either students or parents. The following resources are listed next to an abbreviation that will be utilized in the Results section. Academic resources such as the writing center (WC), office hours (OH), and tutoring services—both free (FTCip) and paid (PTCip for in-person, OTS for online)—were highlighted for their potential to support student success. Student-focused wellness and community resources included the student health center (SHC), cultural centers (CC), gyms and intramurals (GIS), and on-campus (beginning in “On”) and off-campus (beginning in “Off”) organizations for spiritual (CSR), cultural, and social engagement (CCO). Parenting-specific resources addressed childcare needs, including on-campus daycare (OnCCC) and child development centers (CDC), off campus childcare options (OffCCC), and programs offering free babysitting (FBP). Support groups for student-parents (SG) were also identified as valuable for fostering connection and shared experiences.

The research team chose to focus on this group of students with the knowledge that they would not have the same access to resources as their non-parent student counterparts. Thus, we specifically asked participants to identify if any of the previously mentioned resources were ones which were less accessible to them because of their position as student parents. Participants were once again invited to share any resources that they were unable or less able to use due to their role in a free response question.

Preliminary Results

The preliminary sample was comprised of 15 graduate student parents. Originally, the study was set to target both undergraduate and graduate students, but due to an easier solicitation structure for graduate students, a bias towards graduate students showed up in the data. Solicitation structures focused on recruiting undergraduate student-parents will be considered for the final survey for Phase I. Figure 1 shows a breakdown of their demographic information, including their current year of graduate school, number of children, and age group.

Demographic Data			
Total Participants	15		
Age Group		College of Engineering	9
18-25	1	Commute Time	
26-35	7	Less than 15 minutes	8
36-45	6	More than 15 minues	7
46-55	1	Number of Children	
School Year		1 Child	9
Years 1-2	8	2 Children	6
Years 3+	7		

Figure 1. Demographic Data of Participants

In the Demands section of the survey, participants' responses were assigned numerical values based on the frequency of impact on their lives: "Not at all" = 0, "Once or twice a month" = 1, "Once or twice a week" = 2, and "Nearly every day" = 3. The average scores were calculated for most demographic groups. However, due to the small number of participants in the 18-25 and 46-55 age groups, their responses were excluded from reporting to ensure participant privacy. Results can be seen in Table 1.

Table 1. Average Scores (range: 0-3) Related to the Impact of Demands on Student-Parents for Each Demographic Group

Data Set	TB	FS	EPF	LSN	LTN	AC	WLB	LPF	ML	CU	SI	SLSM	Overall
All Data (n = 15)	2.67	2.07	2.40	1.87	2.13	1.80	1.73	0.87	2.07	1.73	1.60	1.60	1.88
COE (n = 9)	2.67	2.13	2.33	1.89	2.44	1.78	2.22	1.22	2.33	1.78	1.56	1.89	2.02
Age 26-35 (n = 7)	2.71	1.86	2.57	1.57	1.71	1.71	1.57	0.71	2.14	1.71	1.43	1.14	1.74
Age 36-45 (n = 6)	2.50	2.20	2.50	2.33	2.67	1.83	1.67	1.17	1.83	1.67	2.00	2.17	2.04
School Years 1-2 (n = 8)	2.50	2.43	2.38	1.88	2.25	2.13	1.38	0.75	1.75	1.25	1.63	1.63	1.83
School Years 3+ (n = 7)	2.86	1.71	2.43	1.86	2.00	1.43	2.14	1.00	2.43	2.29	1.57	1.57	1.94
Commute <15 Minutes (n = 8)	2.63	2.14	2.25	1.75	2.38	1.88	2.25	1.00	2.38	1.88	1.38	2.00	1.99
Commute >15 Minutes (n = 7)	2.71	2.00	2.57	2.00	1.86	1.71	1.14	0.71	1.71	1.57	1.86	1.14	1.75
1 Child (n = 9)	2.67	1.88	2.44	1.78	2.00	1.78	1.33	0.56	1.78	1.89	1.33	1.33	1.73
2 Children (n = 6)	2.67	2.33	2.33	2.00	2.33	1.83	2.33	1.33	2.50	1.50	2.00	2.00	2.10

In the Resources section of the survey, participants' responses were assigned numerical values based on how frequently they used specific resources: "Never heard of it" = 0, "Heard of it but never used" = 1, "Used it once or twice" = 2, "I use it multiple times a semester" = 3, "I use it every week" = 4, and "I use it nearly every day" = 5. The results were reported as averages for each demographic group that data was collected on, as seen in Table 2.

Table 2. Average Scores (range: 0-5) Related to Student-Parents' Use of Available Resources for Each Demographic Group

Data Set	WC	OH	SHC	CC	FTCip	PTCip	OTS	GIS	OnCCO	OffCCO	OnCSR	OffCSR	CDC	OnCCC	OffCCC	FBP	SG	Overall
All Data (n = 15)	1.20	1.86	1.80	1.07	0.60	0.33	0.40	1.33	0.93	0.73	0.60	0.80	0.27	0.80	1.47	0.67	0.27	0.84
COE (n = 9)	1.33	1.50	1.89	1.22	0.67	0.33	0.44	1.11	1.00	1.11	0.67	1.22	0.22	0.67	1.44	0.56	0.22	0.87
Age 26-35 (n = 7)	1.29	1.71	2.00	0.86	0.57	0.43	0.29	1.71	0.86	0.43	0.71	0.43	0.43	1.00	1.29	0.57	0.29	0.83
Age 36-45 (n = 6)	1.17	1.60	1.33	1.17	0.50	0.17	0.33	0.83	1.00	1.17	0.50	1.17	0.17	0.50	2.17	0.83	0.17	0.82
School Years 1-2 (n = 8)	1.00	1.86	1.75	1.25	0.38	0.13	0.25	1.50	1.00	1.00	0.50	1.00	0.38	0.75	2.00	0.88	0.38	0.89
School Years 3+ (n = 7)	1.43	1.86	1.86	0.86	0.86	0.57	0.57	1.14	0.86	0.43	0.71	0.57	0.14	0.86	0.86	0.43	0.14	0.79
Commute <15 Minutes (n = 8)	1.38	1.71	1.88	1.38	0.75	0.38	0.50	1.50	0.75	0.63	0.63	0.75	0.13	0.88	1.50	0.63	0.13	0.86
Commute >15 Minutes (n = 7)	1.00	2.00	1.71	0.71	0.43	0.29	0.29	1.14	1.14	0.86	0.57	0.86	0.43	0.71	1.43	0.71	0.43	0.82
1 Child (n = 9)	1.22	2.00	1.67	0.89	0.78	0.33	0.33	1.22	0.89	0.44	0.67	0.44	0.22	0.89	1.00	0.56	0.33	0.77
2 Children (n = 6)	1.17	1.67	2.00	1.33	0.33	0.33	0.50	1.50	1.00	1.17	0.50	1.33	0.33	0.67	2.17	0.83	0.17	0.94

In addition to the quantitative data, there were some answers received from the survey in a short-form answer section. While many answers were left blank, some highlighted further areas for improvement campus support networks and the structure of the survey itself. The first theme among respondents was associated with childcare costs compared to the graduate student stipend, asking for "consider[ation of] minimal childcare pay for the student" and that "the cost health insurance for dependents through [the university]...takes a substantial part of the stipend." Another interesting theme from short-form answers was limited access to social activities on campus such as student clubs and intramural sports. The reasons for this limited access included "I don't have the time to go" and "resources are limited and users are in large number". One critique of the study that will be taken into account in the final survey design is that there were no questions in the survey related to working student-parents. As one respondent pointed out, "How are my kids supposed to eat if I don't work?", then later, "The real challenge is the work/school balance, which is then complicated by having kids."

Preliminary Discussion & Future Work

Due to the small sample sizes for the pilot survey, statistical significance cannot be analyzed for this portion of Phase I. This pilot study has helped us identify further areas where it might be important to gain information, as identified in the Limitations section, and we hope to use our presentation time at ASEE to gather further feedback on these areas.

In the Demands section, the most prevalent impact for each data set was under the Time Balancing (TB) category, averaging a score of 2.67 (between "Once or twice a week" and "Nearly every

day)” on a scale of 0-3. The category with the next highest score was Emotional and Physical Fatigue (EPF) with a score of 2.40. While most other demands had average scores between 1.60 and 2.13, the Lack of Program Flexibility (LPF) category had a notably smaller average score at 0.87 (between “Not at all” and “Once or twice a month”), indicating that participants had generally few issues with program flexibility. The groups with the highest average responses in the Demands section overall were student-parents with 2 dependents; this group had an average response score of 2.10, which is 12% higher than the average response score of the whole dataset, 1.88. Once again, it cannot yet be determined whether this is a significant difference between groups due to the low number of participants.

The Resources section of the survey was somewhat surprising—even though the scores of the responses went from 0 (“Never heard of it”) to 5 (“I use it nearly every day”), all but two resources had an average score below 1.5 (between “Heard of it but never used it” and “Used it once or twice”). The two resources with the highest scores were Office Hours (OH) and the Student Healthcare Center (SHC), with average scores of 1.86 and 1.80, respectively. The only other average scores above 1 (“Heard of it but never used it”) were Off-Campus Childcare (OffCCC), Gyms & Intramural Sports (GIS), the Writing Center on campus (WC), and university-sponsored Cultural Centers (CC), with scores of 1.47, 1.33, 1.20, and 1.07, respectively. The remaining categories—including resources such as free on-campus tutoring and an on-campus program that provides free babysitting once a month—remain below scores of 1, meaning that even if student-parents had heard of the services, most respondents had not participated in them. Interestingly, student-parents with 2 dependents once again scored about 12% higher than the overall average responses for the Resources section, indicating that the increase in demands for this group might be related to an increased use of resources.

In the second phase of this research, a qualitative study methodology will be implemented to attempt to explain these phenomena. According to our preliminary data and keeping with the SD-R framework, the focus of that study should include how the demands of balancing time and fatigue affect student-parents' combined roles and why most resources for student-parents seem to be underutilized.

Limitations

The first limitation is that the university where the study was conducted is not located in a metropolis area; therefore, the respondents consist of student-parents who are more likely to have had to move to go to school. This may show a bias against parents who do not have the means to upend their families' lives for their education.

There are various limitations in this pilot study that can be improved in the final study design. **It is the improvement of the final survey design where we seek the most feedback from ASEE conference attendees during the presentation**, in addition to advice regarding solicitation to undergraduate student parents. First, this study did not ask participants about whether they are supported in childcare by a domestic partner or relative. Since other sources predict that many women in college who have children are single mothers (Doorley et al., 2023), this is a possibly significant demographic, especially as it may vastly increase the stressors associated with the combined student-parent role. The second possible limitation is that the ages of the participants' children were not collected, which might affect how much time and effort the parent has for homework. A third possible limitation of this survey was that there was a lack of consideration of working student-parents in the survey design, which creates further barriers to campus resources.

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