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IMPACTS OF MENTORSHIP ON INTERNSHIP FOR INDUSTRIAL DESIGN STUDENTS: A CASE STUDY OF THREE COMPREHENSIVE UNIVERSITY PROGRAMS.

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ABSTRACT | Building off previous studies demonstrating the positive impacts of internships for undergraduate students (Binder et al., 2014), this investigation explores how mentor/mentee relationships support positive internship experiences. Much has been written about the benefits of mentorship (Hamilton et al., 2019), including the development of ‘soft skills’ and greater opportunities for employment post-graduation. Notably, mentorship has up until this point not been researched specifically as it relates to the ultra-competitive and ever-evolving field of industrial design. This work has direct implications for university industrial design departments who are focused on providing a pathway for student success in entering professional practice. In order to assess the impact of mentorship programs on internship placements, we conducted a case study and research analysis examining three different industrial design departments’ approaches to mentorship programs. These approaches include the absence of a formal mentorship program, the option for an informal mentorship program with professionals, and the option for a structured mentorship program with professionals. Other formats including peer-to-peer mentorship and on-the-job mentorship, are also considered. Obstacles to positive mentorships, including scheduling challenges, unclear expectations, and misaligned expertise are discussed. Results indicate that students engaging in any mentorship program demonstrate a higher likelihood of both applying for and securing internships. This investigation is a model for further investigations involving a broader range of institutions, mentorship, and internship experiences.

1. Introduction

The majority of Industrial Design (ID) also known as Product Design (PD) programs in the United States aim to prepare students for the demands of the profession upon completing their studies. This study focuses specifically on ID programs at three public, comprehensive universities that emphasize preparing students for entering professional practice. In many ID programs in the U.S., professional internships are an integral component in this preparation, typically conducted outside the confines of the academic institution. These internships are highly competitive and are widely acknowledged in improving students' prospects for success in the workforce. They offer invaluable opportunities for industrial design students to learn on-the-job skills, grow their networks, and build workplace readiness that cannot be replicated within a classroom setting alone. Students who have had internships have competitive advantages with post-graduate employment: internships help students feel more prepared and prospective employers value the work experience they've already had. Research indicates that students who engage in internships relevant to their profession stand a 14% higher chance of securing employment in their chosen field (Binder, Bagueley, Crook, & Miller, 2014).

Additionally, beyond the practical experience gained during internships, mentorship plays a significant role in growing students' professional development. Mentorships pair experienced individuals (mentors) with others who have less experience (mentees). Mentoring relationships are a long-standing tradition in many fields and range from periodic, informal conversations to structured mentorship programs that include regularly scheduled meetings. When professional industrial designers mentor industrial design students, students benefit from individualized feedback, perspective on the design industry, and guidance on how to elevate schoolwork to a professional level. Mentors directly connect students with their goals and opportunities to help them succeed.

Both internships and mentorships link design education to design industry, preparing students for entrance into the workforce. Although research has demonstrated the importance of industrial design internships and the benefit of mentorships in other fields, there has been limited research focused specifically on mentorship for industrial design students.

1.1 Types of Mentorships

This study focuses on five different types of mentorships:

- **Organic:** Not organized by a school or group, these connections often come from friends or family and are generally more casual in format.
- **Peer to peer:** This is a student-lead initiative connecting third- and fourth-year students with first- and second-year students. Although there may be some focus on professional practice, these mentoring relationships tend to focus on school.
- **Project-based support:** An industrial design department seeks out professional mentors for students in a specific project (i.e. the senior capstone). This is an organized program where each student is intentionally paired with a mentor.
- **Professional mentorship program:** Students opt-in to have their industrial design department pair them with a professional for general guidance and support. The department may make efforts to pair students with professionals based on skill expertise or sub-industry (i.e. automotive, footwear, etc.)
- **Internship-based:** Many of the best internship experiences include an on-the-job mentor who serves as a point person for the intern/student while they are at the company. These relationships sometimes continue even after the internship has concluded.

1.2 Participating Universities

The University of Kansas, Western Michigan University, and the University of Kentucky, all 4-year comprehensive university ID or product design programs in the United States, participated in this study. Each program has a distinctly different approach to mentorship, and this investigation looks closely at each program in an effort to assess how mentorship impacts internship placement.

University of Kansas

University of Kansas' industrial design program, established in 1941, is a four-year program with approximately 70 undergraduate students. Graduation does not mandate an internship; however, students are able to participate in internships during the school year and earn academic credit toward their graduation. This program has two voluntary mentorship programs for all students from 1st through 4th year, pairing a professional (usually alumni or personal contact of the Program Director) with two students, one 1st or 2nd year student with one 3rd or 4th year student. Both mentorship programs are affiliated with student clubs, IDSA and Women in ID. The Program Director spearheaded and now manages all aspects of both programs.

Both student clubs offer mentorship programs following the above structure, however the Women in ID club offers female identifying professional mentors for members of the Women in ID club. Interestingly, all female identifying students opted to participate in the Women in ID mentorship program rather than the IDSA mentorship program which does not specify which gender mentors are.

University of Kansas' mentorship programs are both structured, with an onboarding process for all mentors where expectations and best practices are discussed. The Program Director checks in every 3 months with all mentors to ensure their needs are met. Mentees are paired to mentors with the area of ID that they are most interested in mind, for example, research-minded students are paired with research-focused professionals, and consumer product design-focused students are paired with designers in the field of consumer product design. The mentors meet with both students together biweekly, usually virtually, so both students receive feedback from the professional. The 3rd or 4th year student also mentors the 1st or 2nd year student. The Program Director meets with students regularly to ensure the mentorship is running smoothly.

Western Michigan University

The Richmond Institute for Design and Innovation at Western Michigan University was established in response to local industry demand, and offers a relatively new four-year Product Design program. The program, which had its first graduating class in 2021, maintains an average enrollment of 100 students. Corporate partners have engaged with the program since its inception, with many individuals offering to support students in a mentorship role. The first director of the program personally paired professionals with all third and fourth-year students, providing contact information but no guidance or oversight for how and when mentors and mentees should meet, or what they might want to discuss.

Since the departure of that Program Director in 2022, the mentorship program has been in flux and there is not an established process for a consistent mentorship program. The school is continuing to develop their mentorship engagement including a new student-lead peer-to-peer mentorship initiative. Western Michigan University has internship participation as a graduation requirement, and students occasionally stay connected to mentors from their internships after they return to school.

University of Kentucky

University of Kentucky has a Product Design Department and graduated its first class in spring 2024. This is a burgeoning department with an anticipated average enrollment of 60 students. The University of Kentucky does not require internship participation in order to graduate from the program. Project-specific professional mentors were coordinated for the first graduating class during the fall semester of their fourth year. The focus of the mentorship program is currently to offer guidance and perspective on the senior thesis project. Mentors, most of which are not local, have been consistently invited to participate in virtual classroom critiques. The majority of mentors were found via the department Chair's personal connections or from online platforms such as Linked-In as the program does not yet have any alumni to pull from.

2. Research Setup and Focus

2.1 Measures

University

Participants were asked to identify their university. The options included: Western Michigan University (WMU), University of Kansas (KU) and University of Kentucky (UK).

Mentorship Program

Participants were asked to identify whether they were participating in a mentorship program. Participants were asked: “Do you participate in an ID mentorship program?”. They were given the following options: 1) yes, my department offers a mentorship program, 2) yes, I'm in a mentorship program outside my department, 3) no, my department does not offer a mentorship program, and 4) no, my department offers a mentorship program and I'm not participating. In one analysis, we recoded this variable into two categories due to small samples sizes; this recoded variable had the following categories: 1) yes, I am participating in any internship program, and 2) no, I am not participating in any internship program.

Internship Experiences

Internship experiences were measured three indicators. First, participants were asked if they had participated in any internships since beginning their ID program (responses were “Yes” or “No”). Second, participants were asked: “How many internships/ apprenticeships have you participated in?” with a range of 0-4 provided.

Third, among participants with internships, participants were asked “How did you land your internship? Please select all that apply” with the following options: 1) you responded to a job/internship posting, 2) you met someone at the company through networking, someone outside your university to the company, if so who?, and 3) someone inside your university referred you to the company, if so who? And Other (open response). For analytic purposes, we recoded these variables to include two categories: 1) applied via a posting only (participants who only selected “responded to a job/internship posting”) and 2) applied with any personal connections. Importantly, in our analyses, we focus only on how participants landed their first internship (if they reported more than one internship).

Internship Impact

Participants who had participated in at least 1 internship were asked: “How would you rank the impact of all your internships on each of the following? (With 0 showing no impact, and 5 showing maximum impact)” with the following domains: 1) career/professional learning, 2) benefit to your future, and 3) benefit to your industrial design education. Our analyses use each individual scale as well as a summed version of the three scales to determine overall impact, where higher scores indicate greater perceived impact.

Mentorship Program Benefit

Participants who reported participating in a departmental mentorship program were asked: “Rank benefit of mentorship, 1 being not beneficial 5 being extremely beneficial.”

2.2 Sample Size & Missing Data

In total 117 participants began the survey. Of these participants, 116 provided answers to which university they attended, but only 114 provided answers to the question about mentorship programs. Among those that provided information about mentorship programs, 109 provided information about whether they had ever participated in an internship. Among participants who had ever had an internship (n=35), 30 provided information on mentorship program participation, how they landed their internship, and how impactful they perceived their internships to be. Finally, among those who reported participation in a departmental mentorship program (n=55), 50 provided feedback on how beneficial they perceived this program to be.

2.3 Analytic Plan

The focus of this paper is on the impact of departmentally supported mentorship programs on internship experiences and impact as well as exploring perceived mentorship program benefit among students. To address these research questions, we used descriptive cross-tabulations and chi-square tests of independence as well as bivariate ordinary least squares (OLS), negative binomial and logistic regression models. Logistic and negative binomial regression coefficients are exponentiated to ease interpretation. Due to small sample sizes, we did not employ multivariable tests. Qualitative data from open-ended survey questions as well as interviews with $n=12$ students will be leveraged alongside quantitative data in the analysis.

2.4 Results

Mentorship Program Participation

Among the participants, 48.3% reported participating in a departmental mentorship program, 30.7% reported their department had a mentorship program they were not participating in, 17.5% reported their department did not have a mentorship program and they were not participating in another mentorship program, and 3.5% reported participation in a non-departmental mentorship program. A chi-square test of independence showed mentorship programs and university were not independent ($\chi^2=56.10$, $p<0.001$) (Table 1).

As expected, a bivariate logistic regression analysis showed that compared to KU there were no statistical differences in likelihood of participating in a mentorship program at WMU. However, compared with KU students, students at UK had significantly lower odds of participating in any mentorship program ($OR=0.0203$, $SE = 0.0216$, $p<0.001$, Table 2).

Mentorship Programs and Internships

Next, using bivariate logistic regression we analyzed whether the 4 types of mentorship programs were associated with having any internships and how those with internships landed their internship (Table 2). Compared with students participating in departmental mentorship programs, students in departments with mentorship programs they were not participating in had lower odds of having any internship ($OR=0.318$, $SE=0.162$, $p<0.05$). In addition, there was a marginally significant lower likelihood of students having any internship experiences among students whose departments did not offer a mentorship program compared with students participating in departmental mentorship programs ($OR = 0.318$, $SE = 0.200$, $p<0.10$). Notably, however, there was no significant difference between the likelihood of having an internship between students participating in departmental versus non-departmental mentorship programs.

We found no significant differences in types of mentoring programs and the likelihood of landing a first internship via personal connection/networking versus responding to an ad alone (Table 2).

A negative binomial regression model, suitable for count outcomes, showed that students not participating in available departmental mentorship programs had significantly fewer internships compared with students who were participating in departmental mentorship programming ($IRR=0.37$, $SE=0.16$, $p<0.05$). There were no significant differences in the number of internships between the other groups and the reference group (Table 2). A Poisson model was also fit to these data, and the results did not substantively differ (available upon request).

Among students who had any internships, there was no association between the impact scale and the various mentorship programs (Table 2). However, respondents not participating in an available departmental mentorship program who *had* participated in an internship ranked the impact of their internship on their career lower than their peers who were participating in the departmental mentorship program ($\beta = -0.900$, $SE=0.367$, $p<0.05$).

Perceived Mentorship Benefit

Among students who participated in a departmental mentorship program, the average perceived benefit was 4.02 (SD =0.869) on a scale from 1 (least useful) to 5 (best). The perceived benefit of mentorship did not vary by internship experience (Table 2).

Participants also were asked an open-ended question: “Explain how your mentorship has or has not been beneficial.” These qualitative responses provide further insight into the quantitative findings, suggesting that having a professional contact is helpful for getting more feedback on school projects and specifically for portfolio preparation. For example, one student drew a direct connection between their mentor and job placement: “My mentor... helped me prepare for interviews, better build and fill my portfolio to better attract jobs, and helped me construct strong presentations. Great experience!”

A few students mentioned differences in personalities with mentors and busy schedules as challenges. According to one student, feedback from mentors is not necessarily positive or empowering: “They also discouraged my participation/choice of degree in industrial design and claimed that I am not correct for this profession.”

Interviews

Informal, semi-structured interviews (n=12) offered the opportunity to understand student perspectives and experiences with mentorship programs, mentors, and internships. Four students from each participating university, including equal numbers of 3rd and 4th year students, were interviewed via Zoom. Mentorship-specific questions were posed after a series of questions focused on internship experiences, which may have had an impact on how students framed their responses.

Questions posed:

For students who have a design mentor:

- How did you get paired with your mentor?
- How formal or informal is the relationship? When do you meet, what are those meetings like, etc.?
- What is one thing you’ve learned from your mentor?
- What do you think the benefit(s) of having a mentor are?

For students who do not have a design mentor:

- If not, would you like to have one? Why?
- How might you go about finding a mentor and starting the sort of exchange that would be most beneficial to you?

For everyone:

- Have internships or mentorships (if they had one or both) changed your approach to school?

Types of Mentorship

- Students mentioned many types of mentorship: peer-to-peer, professional, and on-the-job. All types of mentorships were perceived as supportive and beneficial.
- Internships that provide students with an on-the-job mentor were especially good experiences.
- These mentors act as a point person for the student, providing insight into company culture and guidance for the internship while also offering skill-based demos.
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Mentors Facilitating Storytelling

- Mentors often focus on portfolio reviews and guidance for giving presentations.
- Emphasis was consistently on how to tell the story of a project or portfolio in a way that would resonate with the audience.

Mentors and Confidence

- Students are hesitant to engage with a professional mentor if they are not yet confident in their portfolio. There is a sense that professionals will only want to engage with students at a certain (high) skill level.
- Working with a mentor helps students feel more confident, which may encourage them to apply for internships.
- Mentors are a valuable resource for students on internships who need support navigating the professional landscape.
- During internships, students are not as engaged with the academic environment and less likely to seek out guidance from faculty.

Mentors are Desirable

- Students who don't have mentors due to lack of support from their program want them.
- Students are unclear on how to find a professional mentor if their program does not facilitate the process.
- At department C, most students were initially unfamiliar with the concept and function of mentors. However, after learning about them they all were interested in having one.

Mentors Define Professional Expectations

- Mentors offer up-to-date, professional, outside perspectives on student work.
- Students who have worked with a mentor are empowered and ready to graduate/enter the workforce.

Mentorship Program Structure Impacts Mentorship Experience

- Department A has guidelines for their mentorship program (how often to meet, what to discuss), which ensures all students have an opportunity to build a relationship with their mentor.
- Department B has provided mentorship pairing, but very little structure. The rate of success for mentorships in this program varies more widely.
- Department C offers mentors for one specific project. Students did not understand they could ask for guidance outside the bounds of that project.
- Internships consistently were recognized as providing valuable mentorship; students defined the difference between an internship and a job as the mentorship aspect during their tenure at the company.

Table 1. Mentorship Program Participation by University.

	B	A	C	Total
Yes, my department offers a mentorship program I am participating in	24	30	1	55
	63.16%	62.5%	3.57%	48.25%
Yes, I'm in a mentorship program outside my department	3	1	0	4
	7.89%	2.08%	0%	3.51%
No, my department does not offer a mentorship program	4	0	16	20
	10.53%	0%	57.14%	17.54%
No, my department offers a mentorship program and I'm not participating	7	17	11	35
	18.42%	35.42%	39.29%	30.7%
Total	38	48	28	114
	100%	100%	100%	100%

Note: The top row contains sample sizes and the second row has percentages.

Table 2. Bivariate Regression Models.

Sample: All Participants with Responses				Sample: Participants with Internship Experience					Sample: Students in Departmental Mentoring Programs
	Any Mentorship Program? ^c	Any Internship ^c	Number of Internships ^d	How Did You Land Your Internship ^{ac}	Impact Scale ^e	Impact on Career ^e	Impact on Future ^e	Impact on Education ^e	Perceived Mentorship Program ^c
University (Reference = University A)									
University B	1.346								
	(0.630)								
University C	0.0203***								
	(0.0216)								
Type of Mentorship Program (Reference = Yes, my department offers a mentorship)									
Yes, I'm in a mentorship program outside my department		1.273	-0.180	Omitted ^b	0.400	-0.700	0.300	0.800	
		(1.323)	(0.434)		(2.651)	(0.752)	(0.875)	(1.437)	
No, my department does not offer a mentorship program		0.318+	-0.280	2.455	-1.600	-0.200	-0.450	-0.950	
		(0.200)	(0.221)	(3.041)	(1.417)	(0.402)	(0.468)	(0.768)	
No, my department offers a mentorship program and I'm not participating		0.318*	-0.423*	1.227	-2.200	-0.900*	-0.700	-0.600	
		(0.162)	(0.184)	(1.249)	(1.293)	(0.367)	(0.427)	(0.701)	
Any Internship (Ref = None)									
Any Internship									-0.0357
									(0.250)
Constant	1.824*	0.786	0.680***	1.222	13.60***	4.700***	4.700***	4.200***	4.036***
	(0.550)	(0.224)	(0.118)	(0.549)	(0.578)	(0.164)	(0.191)	(0.314)	(0.166)
Observations	114	109	109	29	30	30	30	30	50

Exponentiated coefficients where indicated; Standard errors in parentheses. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Notes: (a) This outcome has two categories including applying via an ad only compared with applying with any personal connection. The reference group was applying via an ad only.

(b) Category omitted due to collinearity (c) Logistic Regression Model; exponentiated coefficients (d) Negative binomial regression model; exponentiated coefficients

(e) Ordinary least squares regression

3. Discussion

Mentorship has proven to be an overwhelmingly positive experience for industrial design students, especially in preparing for and navigating internships. This research shows that students who don't engage in mentorship opportunities have lower odds of having any internship. Students who were not participating in mentorships even when they were available often cited a lack of confidence in their skills and not wanting to seem incapable or unprepared for the engagement or interaction. This study also indicates that students whose departments did not offer a mentorship program were less likely to have any internship experience when compared with students who participated in a departmental mentorship program. This raises a question in regards to the goals of higher education and reveals an opportunity to investigate the tension between the historical ideal of universities as hubs of knowledge creation versus the contemporary expectation that upon graduation, university-educated students will successfully enter the workforce. All three programs have a different approach to internships, including requirements to graduate, and that has an impact on the results of the study. That being said, for programs that are focused on professional practice, these findings demonstrate the importance of offering a department-organized mentorship program and encouraging all students to participate.

Students who have worked with a mentor emphasized the focus of that interaction being primarily on presentation skills and portfolio preparation. Mentors who are working in industry are well situated to teach students to talk about their work in a way that will resonate with professionals during internship interviews. Portfolio development often takes place outside of a classroom setting, without the formal guidance of a faculty member. Mentors offer an especially important point of contact for portfolio direction and feedback.

Mentorships can be a confidence contradiction. Students who don't feel confident in their work or skill level are less likely to seek out a mentor, but working with a mentor is a proven way to build confidence. Students felt that their mentors were a direct line to what is current and relevant in the field and trusted their input. Mentors at internships offered techniques and skill refinement, which helped them feel confident in their work. Mentors also offer students a networking foundation, connecting mentees with colleagues who are actively hiring. Departments that maintain a mentorship program, in which every student is paired with a mentor, ensure that all students have access to the demonstrated benefits of mentorship without the opportunity to opt-out.

The different mentor program approaches from the 3 institutions showed that when a mentorship is a school requirement, not all students are necessarily engaged, and this can be difficult to manage. If research shows that mentorships have a positive impact on students' success in finding internships, then it is imperative that programs have consistent and structured mentorship programs that ideally include all students from 1st through 4th years. This is likely to improve retention rates and student success. Importantly, it would also increase student confidence and the likelihood of gaining a competitive internship. Mentorship programs bring many challenges, including finding qualified mentors, identifying mentee/mentor pairings, and counseling mentors on expectations and goals. While most programs do not have a specific faculty or staff member who gets credit for managing their mentorship program, one individual typically takes responsibility. This can lead to inconsistency if there is faculty or staff turnover, resulting in the mentorship program dissolving or becoming disrupted.

Mentors benefit students in myriad ways, including helping them feel comfortable and confident while job searching. Students felt prepared to apply for internships, and they felt confident in the interview process due to the coaching they received from their mentors. The wide range of mentorships reflected by this study reveal that there isn't a standard structure or approach in industrial design departments or the industrial design profession. Developing guidelines for how to facilitate student engagement with professionals could encourage more departments to develop a mentorship program, and offer a strategy for pre-existing mentorship programs to improve.

Although most students who had a mentor considered it a good experience, some faced struggles. At least one mentor advised his or her mentee to consider changing majors, without offering counseling on how to improve after the student stated that they wanted to remain in the program. Others found it difficult to find available time to meet. Students did not always know how to navigate these situations, sometimes resorting to letting the mentorship lapse. Industrial design departments need to be aware that the mentor pairing may not be a good fit and need to have a system in place with regular check-ins with the student and the mentor to ensure that the relationship is beneficial and functional.

It is worth noting that a degree in industrial design is expansive (graduating students are equipped with a range of skills), and the field is competitive. University of Kansas will only offer academic credit for internships focused on industrial design, and intentionally pairs students with mentors currently working in industrial design. Western Michigan University and the University of Kentucky don't have the same guidelines, so students included in this study may have mentors and/or internships that fall outside the 'classic' definition of industrial design. Additionally, it can be a challenge to find suitable mentors if there is not a large pool of alumni to draw from. The benefit of engaging with alumni is that the faculty know their personalities and skills and are better equipped to pair them with students.

4. Conclusion

Both mentorship and internship experiences prove to be beneficial by offering industrial design students exposure to professional practice, contextualizing school work, and improving students' confidence in their ability to succeed in school as well as being prepared to enter the workforce. This study suggests that students who work with a mentor are more confident, consequently more likely to apply to and land internship opportunities. Students need support in initiating and maintaining mentorships, and one way that industrial design departments can offer that support is through organized mentorship programs.

This investigation is decidedly student-centered, seeking to better understand student experiences and perceptions. There is immense opportunity for further research concerning other stakeholders: industrial design departments, mentors, and companies where the mentors are employed. Although this research shows that departmental mentorship programs lead to better student outcomes, organizing those programs is a significant logistical burden. The mentorship program at Western Michigan University dissolved when the faculty member who organized it left the university. Given the clear benefits of mentorship, this suggests the merit of developing a more structured approach to insure consistency, regardless of faculty turnover.

There is merit in continuing investigation, including:

- Other fields, including medicine and engineering, have a long history of relying heavily on mentorship and internship. A comprehensive literature review of scholarship on mentorship and internship in these fields would help inform best practices for internship and mentorship in industrial design.
- Since there is no universal or consistent structure for mentorship programs in industrial design education, a wide-reaching audit of current mentorship programs would help inform strategies for organizing and executing successful mentorship programs.
- The perspective of mentors must be considered. A study focused on mentors could uncover insights on why mentors mentor, what they get out of it, and how they learn to guide and interact with students. This, in turn, could be beneficial for better equipping mentors for more consistently successful mentorships.
- Although mentorships are routinely integrated into educational experiences, they are less frequently assessed. It would be beneficial to identify the elements of a successful mentorship and consider development of an assessment tool for mentorship programs.
- Unwillingness to participate in a mentorship program could indicate lack of interest or ambition, but it could also reflect a student's need to be employed while in school. (Having a job limits time for extracurriculars like mentorship and internship.) Considering structures and formats that allow for wider access to the benefits of mentorship would lead to more universal improved student outcomes.

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