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INCREASING THE EDUCATIONAL IMPACT FOLLOWING A FIELD STUDY PROGRAMME

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ABSTRACT
Design students return from field trips abroad brimming with new ideas and a greater understanding of their chosen discipline. However, if their observations and knowledge are not soon applied, the students hold only fond memories of a fun trip abroad. We believe that student's retention and application of concepts will increase if educators give students greater autonomy on the trip and also expect and enable opportunities to apply their accrued knowledge on their own projects upon returning home.
Nine third and fourth-year industrial design students Brigham Young University participated in a weeklong field study abroad to Dutch Design Week (DDW) in Eindhoven, Netherlands. A week after the completion of the study abroad the students filled out a survey about their motivations, feelings, criticisms, and aspects of the trip that influenced them as designers. Three and a half months later the students took a second survey asking about how they have applied insights gained from participation in DDW to their current projects.
The results from the both surveys suggest the impact of the field study trip decreased over time. The observations and more open-ended questions in the survey helped determine if and how the students applied their conceptual knowledge to their current projects as well as other outcomes of the trip. In addition, the paper suggests possible strategies and research opportunities for future field study experiences.

Keywords: Field Trip, Industrial Design, Pedagogy, Design Education, Experiential Learning, Applied learning

1 INTRODUCTION

During October of 2017, I went on my first trip outside of the United States of America. As a third-year Industrial Design student, I travelled to The Netherlands to attend Dutch Design Week (DDW) with eight peers and one professor. It was eye opening and insightful and I returned home with the burning desire to never forget my experience and what I had learned. However, I saw in myself as time went by my enthusiasm from the trip as well as the concepts that I had observed were becoming fuzzy. I was also confused because the insights I gained from speaking with and understanding the multiple designs I reviewed did not seem directly applicable to my projects. I observed this same tendency in some of my fellow travellers who attended the field trip, but not in others. I desired to understand why some students gained an increasing benefit from DDW participation more than others did. Previous researchers have shown that study abroad programmes have many positive effects on students.
Gomez-Lanier found several positive learning outcomes in their study of students who attended both national and international field trips. These included the strengthening of students' understanding of cultural and worldviews, an increase in the students' knowledge of their field of study, and opportunities to integrate classroom concepts into real world situations [1]. They also provided the opportunity for greater experiential learning because they deepen their understanding and appreciation by using all five senses, sight, smell, touch, hearing and taste [2].
Howard and Gulawani point out that there is a tendency when planning and assessing study abroad programmes to focus on holistic (implicit) rather than functional (explicit) learning outcomes. This means that the study abroad focuses more on the student's personal development instead of the attainment of specific skills. Hands on experiences bridge the gap between theory and practice in a

short period. Study abroad programmes are uniquely positioned to provide these hands-on experiences [3]. It becomes clear that opportunities presented in study abroad programmes specific to the students' area of study have an impact on student education.

Loudon and Wilgeroth researched the impact that autonomy in a study abroad programme had on product design students. They argued, "Product design curriculum includes access to knowledge and the necessary tools; there is the setting of challenging and interesting goals; and learning spaces are set out for collaboration, play and prototyping. Most courses encourage creativity and risk taking by setting formative assignments. However, it could be argued that there is not always full "freedom of action" (autonomy) due to the nature of course structures and assessment processes" [4].

While the research listed above focused on longer study aboard programmes then this field study, the outcomes should be applicable to shorter programmes as well. Educators can increase the impact of a field study programme by a) preparing the students beforehand with goals and activities to accomplish during the event, b) giving the students autonomy to curate their own agendas while on the trip and c) creating the opportunity for students to apply what they learned within weeks of returning from the event. This will enable the students to generate a meaningful application of the experience rather than simply returning and declaring, "that was so cool" [5].

2 METHOD

The structure of this field study programme at Brigham Young University was a semester course with travel scheduled for eight days at the midpoint of the semester. The professor held class for one hour each week before the trip. He spent class time discussing the itinerary and logistics. The only assigned course work during DDW was to take pictures of the exhibits and designs on display and talk with exhibiting designers. Students received encouragement to research particular activities and designers that interested them. They accepted the autonomy to guide their own experience. The field study took place from October 21-28, 2017. The participants spent two days travelling, four days attending DDW, and two days in Amsterdam visiting museums and tourist locations. Nine students from the university attended, three third-year students and six fourth-year students. Students were hired as research assistants either to assist on a design trends research paper or to conduct research for their own paper. A nineteen-question survey was sent to the students the week following the trip. This first survey asked for logistical feedback about trip as well as quantitative and qualitative aspects of the trip.

Post DDW travel, weekly class attendance became optional and was devoted to the developing and synthesizing the collected research. Each participant uploaded their photographs to a shared folder, which, they used to identify design trends and inform other papers or projects. Participants made and attended presentations and discussions about writing papers for publication.

Three months after DDW, students participated in a second survey asking about what they gained from the trip and how they applied this knowledge to their current industrial design projects. Three of the seven questions were the same as those included in the initial survey as the remaining questions focused more on the logistical aspects of the trip. The repeated questions were: a) on a scale of 1-9, with 1 being low and 9 being high, please rate the following with a numerical answer. How impactful was this trip on your design career, knowledge of design, current design projects, desire to attend graduate school, and design network? b) Using the same scale as above, what was the overall value of this trip? c) What three aspects of the trip had the most influence on your future as a designer? The new questions in the second survey were: d) was there anything you consciously sought to apply to your work from the trip? e) Can you identify any subconscious influences from DDW in your work? f) Have you implemented concepts gained from the trip into your current work? If so, how? If not, why not? g) What was the most beneficial aspect of the trip for you? The student's numerical rankings from both surveys were averaged and compared and the qualitative learning outcomes were sorted into categories and assessed.

The primary author also interviewed two industrial design instructors. The DDW instructor, who has directed seven study abroad programmes or field studies, reported on the changes and impact that he had seen on students as well as the pros and cons between this short form field trip and past more extensive study abroad programmes. The instructor directing the fourth-year students with their senior projects also reported on the performance differences between the students' work and perspectives before and after the trip.

3 SURVEY RESULTS

The results of both surveys were reviewed for patterns and trends. Seven out of nine students mentioned their current project when answering questions on the second survey about how this trip consciously or unconsciously influenced them. Six of these seven students mentioned a positive impact on their projects. One student reported, "I noticed I was mostly drawn to lighting and well-being projects at DDW which has taken my senior project in a completely different direction from where I started." For the question "Have you implemented concepts from the trip into your current work, If so how? If not, why not"? One student answered, "I have not, only because I don't think any of the concepts really apply to my senior project and I don't have the bandwidth to pursue other projects this semester." Another student responded to that same question with, "I am more conscious of the narrative and concept behind my design work. I have many ideas for personal projects based off of what I gained at DDW but I haven't taken the time to actually do them." For the question about graduate school attendance, five out of nine students reported a desire to attend graduate school and three out of those five expressed that their desire had increased because of the trip.

The categories with the largest range, of student's view of the impact of the trip, were, desire to attend graduate school and increased design network. Table 1 and 2 report results from the first and second surveys in that order.

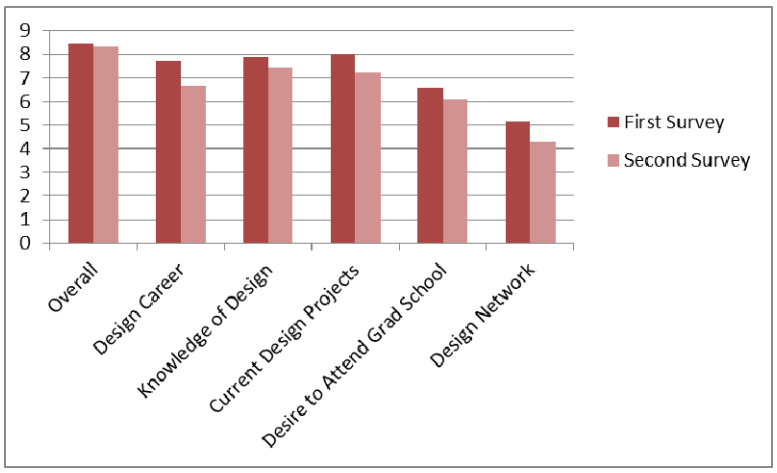
Table 1. Survey one questions and responses, 9 students surveyed 1 week after the trip

On a scale of 1-9 with 1 being low impact and 9 being high impact, please rate the following with a numerical answer.				
How impactful was this trip on your:				
	Average	Median	Mode	Range
Design Career	7.71	8	8	3
Knowledge of Design	7.86	8	9	3
Current Design Projects	8	9	9	3
Desire to attend Graduate school	6.57	6	9	7
Design Network	5.14	6	6,2	6
Using the same scale as above, what was the overall value of the trip?				
Overall	8.43	8	8	1

Table 2. Survey two questions and responses, 9 students surveyed 3 months after the trip

On a scale of 1-9 with 1 being low impact and 9 being high impact, please rate the following with a numerical answer.				
How impactful was this trip on your:				
	Average	Median	Mode	Range
Design Career	6.66	7	7	4
Knowledge of Design	7.44	8	8	4
Current Design Projects	7.22	8	9	5
Desire to Attend Graduate School	6.11	6	6	7
Design Network	4.3	4	7.2	6
Using the same scale as above, what was the overall value of the trip?				
Overall	8.3	8	9,8	2

Graph 1, which compares the results of survey 1 and 2 next to each other, indicates that after three months the student's perception of the impact and value of the trip decreased. However, the students still had quite positive views of all aspects of the trip, but the impact decreases in all areas over time.



Graph 1. Visualization of the averages of the perceived impact of the study abroad from the first and second surveys graphed side by side

4 FIELD STUDY OUTCOMES

Not all the effects of the field study were fully expressed in the surveys. These other outcomes were determined partially through interviews with the students and instructors as well as through personal observation. These outcomes fit nicely under the categories the students rated in the survey. One student after studying the trends observed at DDW created a presentation about those trends enhanced her design career by sharing it with professionals in the field, which led to an internship discussion. All nine students expressed their increased understanding of design, the history of design, as well as the current culture and direction of design.

The students who were concurrently working on self-directed projects were able to apply the knowledge gained to their project immediately and therefore gained more from the trip than those who did not have a clear path to the application of those concepts. One student applied his insights from DDW was a fourth-year student who, after witnessing a trend of material innovation at DDW completely transformed his senior project. Before the study abroad, his project was exploring the integration of branding and objects as seen in Figure 1. At DDW, he saw multiple projects where materials typically viewed as waste were developed and converted into useful design materials. For example, stools made of salt from an abandoned salt field, converting left over cattle blood into dishware and tanning superfluous cow stomachs into intriguing textures and shapes for consumer articles as shown in Figure 2. When he asked his instructor, “Why don’t we do more material studies in our programme?” he responded, “Why don’t you add material exploration to your current project?” He soon began working with disembodied human hair, a discarded material that most people see as worthless. He collected hair from a local hair salon and mixed it with resin to form a “fibre-reinforced” material and created various products and tested its properties and strengths. Examples are shown in Figure 3.

The networking question was a polarizing topic, with the overall impact listed as 5.14 and 4.3 in surveys one and two. We suspect this is because of student’s unique motivations for participating in the trip. The two students, who indicated they wanted to increase their network, successfully used the trip to meet with professional designers and ultimately negotiated and accepted their own international internships, which both students are currently participating in. On the opposing side, the students who were not motivated by networking saw little to no impact on their design network because they did not spend their time networking.

Figure 1. Brigham Young University Student's senior thesis project. The student's focus was on branding before attending DDW. CAD image courtesy of August Simmons

Figure 2. Student work at DAE whose work focused on the utilizing waste products, stools made of salt from unused salt fields, moulded plates of cattle blood, and cow stomach leather carrying bags

Figure 3. Brigham Young University student working on his senior thesis. After attending DDW this student changed the course of his project switching to material exploration using disembodied human hair to create a "fibre-reinforced' material used in product design

Four students expressed interest in writing papers before the trip to help prepare for themselves for attending graduate school. One student opted out of writing a paper after the trip was finished while the other three have successfully completed and submitted papers for publication. The primary author wrote this paper because of her desire to attend graduate school after touring the Design Academy Eindhoven.

5 CONCLUSION

This study focuses on the experiences of nine students, on a weeklong field trip set during the semester. Because of the small sample size of students and the short duration of the trip studied, this study functions primarily as a basis for a more widespread study. It could also be beneficial to apply

these principles to a long-term study abroad programme. There are not many studies focusing on the benefits and drawbacks to a short format study abroad programmes therefore, this could also be a basis for further research.

While there were numerous notable outcomes from the field study; two internships, three papers and six redirected senior thesis, based on survey data, the perceived impact of the trip lessened after three months. Those students who immediately implemented learning from the field study created positive outcomes for themselves, while those who did not let their experience slowly slip away from them.

Students were prepared beforehand with insights about the event, they were asked to research places to visit and designers to meet and then they were given autonomy to curate their experiences to fit their priorities. Those students who put in extra effort before the trip preparing small portfolios and business cards to share with others, those who reserved spots in workshops offered at DDW and those who thoughtfully engaged with designers they wanted to meet with beforehand gained more from the experience than those who did not.

Post trip, instructors could utilize class time to apply the knowledge the students gained by planning for a post-trip experience. This could take the form of writing about the experience, establishing a one, two or three-week self-directed project, compiling the photographs and videos taken on the trip into a formal presentation, or simply meeting to discuss how different aspects of the experience could influence their current projects. This allows students an immediate avenue to apply the inspiration and knowledge they received thus cementing it more in their minds.

These post field trip assignments could follow the design of the study abroad itself giving more autonomy for students to decide what they would like to talk about and pursue. It is important to note that there are students who when given more autonomy and the ability to choose their own project might lose motivation and need help structuring a project [4].

Experience preparation, autonomy in curating their own schedule and a post event creative expectation applying gained knowledge to a current project, a written publication or presentation will increase the impact of a future field study course.

REFERENCES

[1] Gomez-Lanier, L. The Experiential Learning Impact of International and Domestic Study Tours: Class Excursions that are more than Field Trips. *International Journal of Teaching and Learning in Higher Education*, 2017, 29(1), 129-144.

[2] Allen, D., & Young, M. From tour guide to teacher: Deepening cross-cultural competence through international experience-based education. *Journal of Management Education*, 1997, 21(2), 168-189.

[3] Howard, K. and Gulawani, M. Student Perceptions of Study Tour Learning: A case study. *Aweshkar Research Journal*, 2014, 18(2), 101-114.

[4] Loudon, G. and Wilgeroth, P., Impact of a Change of Environment on Autonomy and Design Exploration. In *International Conference on Engineering and Product Design Education, E&PDE'13,* Vol 1, Dublin, September 2013, 868-873

[5] Howell, B., Training Students to Critically Assess a Design Rhetoric. In *International Conference on Engineering and Product Design Education, E&PDE'10, September 2010. Norwegian University of Science and Technology, Trondheim, Norway.*