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Monitoring the Short-Term Outcomes of Community-Engaged, Project-Based User Experience Design Courses

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This paper evaluates short-term outcomes of community-engaged learning (CEL) initiatives within the field of user experience design (UXD). Qualitative data were gathered through a thematic analysis of 101 summative student reflections and 22 interview transcripts from 19 community partner organizations. Quantitative findings resulted from an analysis of 94 student surveys. Findings offer preliminary support for CEL initiatives in UXD education and reveal that CEL benefits both students and community partners. Students garnered UXD competencies, interpersonal skills, and increased empathy through participation in CEL initiatives. Community partners gained useful deliverables and an increased understanding of the discipline of UXD as part of their CEL engagement. Two primary recommendations are suggested for improving future CEL engagement: (1) designating a coordinator/point of contact to alleviate the management burden by centralizing communications; (2) providing a clear outline of the engagement deliverables and timelines up front.

Keywords: community-engaged learning, community partner outcomes, higher education, problem-based service-learning, student outcomes

Monitoreo de los resultados a corto plazo de los cursos diseñados para proyectos que se basan en la experiencia del usuario a través de la participación comunitaria

Este documento evalúa los resultados a corto plazo del aprendizaje a través de la participación comunitaria (CEL, por sus siglas en inglés) dentro del campo del diseño de la experiencia del usuario (UXD por sus siglas en inglés). Se recopilaron datos cualitativos a través de un análisis temático de las reflexiones de 101 estudiantes y 22 transcripciones de entrevistas a 19 organizaciones comunitarias asociadas. Los hallazgos cuantitativos se obtuvieron del análisis de encuestas realizadas a 94 estudiantes. Estos resultados ofrecen un apoyo preliminar a las iniciativas de CEL en la educación UXD y revelan que CEL beneficia tanto a los estudiantes como a los integrantes de la comunidad. Los estudiantes adquirieron habilidades UXD, mejoraron sus relaciones interpersonales y demostraron una mayor empatía a través de la participación en iniciativas CEL. Los integrantes de la comunidad obtuvieron muy buenos resultados y una mayor comprensión de la disciplina de UXD como parte de su compromiso con CEL. Se sugieren dos recomendaciones fundamentales para mejorar la participación futura de CEL: (1) designar un coordinador o punto de contacto para aliviar la carga administrativa y centralizar las comunicaciones; (2) proporcionar desde el principio un esquema claro del compromiso para las entregas de los resultados y sus correspondientes plazos.

Palabras clave: aprendizaje a través de la participación comunitaria, desempeño de los integrantes comunitarios, educación superior, aprendizaje de servicio basado en problemas, desempeño de los estudiantes

Editors' Note: Translation by Yamilet Hernandez Department of English and Foreign Languages Barry University, USA Universities across the globe are being challenged by governments and industries to meet the demands of the modern-day workforce by providing relevant and effective education to students while benefiting the surrounding communities (Gunn & Mintrom, 2018; Ramaley, 2000; Weigert, 1998). As "academic work will increasingly come to be judged and funded on its non-academic impact in addition to its academic value" (Gunn & Mintrom, 2018, p. 10), universities are being called to provide measurable positive impacts on communities outside academia. Community Engaged Learning (CEL) is instrumental in helping universities address this challenge. CEL aims to balance student learning outcomes with community needs, as an experiential education model designed to be equally beneficial for students and community partners (Furco, 1996).

Increased institutional support for CEL has resulted in a large body of research on CEL outcomes in various disciplines, including engineering, kinesiology, and dentistry (e.g., Bielefeldt et al., 2010; Heyet al., 2014; Simmer-Beck et al., 2013). As the majority of these studies focus solely on student outcomes, a number of researchers have suggested that a gap exists in the evaluation of CEL outcomes from a community partner perspective (Blouin & Perry, 2009; Brudney & Russell, 2016; George-Paschal et al., 2019; Littlepage et al., 2012; Srinivas et al., 2015). Recognizing this gap, researchers developed tools to assist in assessment of community partners' perspectives on CEL (e.g., Srinivas et al., 2015). Existing research on community partner experience with CEL suggests that community partners benefit from resources that CEL partnerships provide; however, the benefits are countered by costs of time required for supervision of students, lack of communication, and poor student conduct (Blouin & Perry, 2009).

CEL assessment gap includes outcomes in emerging disciplines such as User Experience Design (UXD). A preliminary study of UXD CEL partnerships by MacDonald & Rozaklis (2017) suggested that positive student and community partner outcomes could be derived from CEL applications in the field of UXD. The study also showed CEL's potential as an effective approach to balancing UXD students' educational needs with needs of community partners. As UXD is a growing discipline that aims to enhance all aspects of the end user's interaction with products and services, evaluative research is required to validate whether introducing CEL in UXD undergraduate and graduate courses is effective. To this end, this paper evaluates the short-term outcomes of CEL initiatives within the discipline of UXD and contributes to deepening scholarly knowledge on community partners' and students' perspectives of CEL engagement.

Background

UXD is often taught as a combination of lecture and studio components (Getto & Beecher, 2016; Gray, 2015; Vorvoreanu et al., 2017). The studio component is ideal for introducing students to CEL, because it would help students develop a professional identity and the tacit knowledge to become successful professionals (Schön, 1983). This includes skills such as professional communication and the ability to articulate the importance of UXD to stakeholders (Vorvoreanu et al., 2017). To develop these skills, students should "rehearse" in non-academic settings (Loseke & Cahill, 1986, as cited in Adams & Welsh, 2008). The value of contextual practice is highlighted in Dewey's theory of experience, which supports the integration of interactive and continuous learning experiences that consider the "objective condition" to ensure the learning experiences are context-appropriate (Dewey, 1938, p. 29). In that sense, placing UXD students in a non-academic environment provides opportunities to embark on learning experiences that might be harder to come by in the classroom.

Experiential Learning Theory (ELT) can help us understand the value of CEL experiences by providing a model of how a student learns. ELT defines a learning cycle composed of four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb & Kolb, 2017). Community partner organizations provide students with an opportunity to enter the learning cycle at any one of the four stages. ELT framework has been applied in CEL projects involving website redesign (Hettche & Clayton, 2013), which are common deliverables in UXD courses. In Hettche & Clayton (2013), each phase of the website design process is related to learning cycle stages: (1) background research—abstract conceptualization; (2) interviews/client engagement—concrete

experience; (3) primary research design—abstract conceptualization; (4) data collection and analysis concrete experience; (5) creative and communication strategy—active experimentation; and (6) report findings—reflective observation.

Projects were structured according to the problem-based service-learning model (PBSL; Hettche & Clayton, 2013). In PBSL, students engage with community partner organizations much like external consultants would work with a client (Campus Compact, 2015). PBSL is well suited for settings where students have a set of skills and/or disciplinary knowledge to contribute (Campus Compact, 2015), and is therefore a good fit for UXD students. The ELT learning cycle framework can also be applied to the teaching of UXD, where lectures provide the foundation for the abstract conceptualization stage and CEL engagement provides ample opportunities for the concrete experience and active experimentation stages. To support students in their learning, professors ask students to reflect on their CEL experiences throughout the course. Regardless of the discipline, in-depth and recurring reflection is key to ensuring that students get the full benefits of the experience (Ash & Clayton, 2009; Bielefeldt et al., 2010; Deeley, 2015; Dewey, 1938; Hatcher & Bringle, 1997; Jacoby, 2015; Vorvoreanu et al., 2017).

User Experience Design and Community-Engaged Learning

One of the main benefits of CEL in the context of UXD is the potential for the broadening of the definition of community engagement from a traditional community engagement model—where students typically engage with the community partner organization—to an extended community engagement model—where students also engage with the members and/or users of the community (see Figure 1).

Figure 1



Traditional Community Engagement vs. Extended Community Engagement

Note. In the *Traditional Community Engagement* model, CEL students interact with the community partners but may never engage with community members and/or users of the products and services offered by the community partners. In the *Extended Community Engagement* model, UXD/CEL students interact with both community partners and community members and/or users, as the discipline of UXD calls for such interactions to inform the design of products/services.

Reciprocity is a key concept in both CEL and UXD. The anthropology definition of reciprocity can be used to describe the UXD research process where the researcher is "giving of oneself and recognizing and accepting the value of what participants have to offer" (Bennett, 2018, p. 2). In the context of UXD partnerships, all parties (students, community partners, and community members and/or users) contribute time an energy to the outcome. Students are able to acquire research experience while addressing a need within the community. From the community partners' perspective, in exchange for time and effort spent on CEL projects, they gain valuable deliverables and opportunities to learn about the UXD process.

Community partners may also gain new insights on their members' perception of products/services that they offer. Therefore, the experience may carry educational value not just for the students but also for the community partners, as they, too, have the opportunity to engage in the reflective observation or abstract conceptualization stages of the learning cycle while they work with students. When community partner organizations adopt some UXD principles, they may begin seeking feedback from their members more frequently, which in turn would give members an opportunity to shape the organization's offerings to better meet the needs of their community.

Research Questions

The questions that guided this research aimed to gather insights into the effectiveness of CEL in the context of UXD education and provide a balanced assessment of student and community partner outcomes. The overarching goal was to monitor the short-term outcomes of two project-based UXD CEL courses. Based on the gap in the evaluation of CEL outcomes from a community partner perspective, and the limited data on the impacts of CEL engagement in the discipline of UXD, this study focused on the following questions:

- (RQ1) What are the short-term outcomes of CEL in relation to UXD student learning?
- (RQ2) What are the short-term outcomes and perceived costs and benefits of UXD CEL engagement for students and community partners?
- (RQ3) What are the effects of CEL involving UXD students on the community partners' understanding and perception of the value of UXD?

Methodology

Courses

Two graduate-level courses were examined in this research. They were offered at the Faculty of Information at the University of Toronto, Canada. Both courses were mandatory for students in the UXD concentration, part of the Master of Information degree. INF2170H, Information Architecture, is generally taken by UXD students in the first semester of their first year, and participation in the CEL component was optional. INF2192H, Representing UX, is taken in the final semester of the two-year master's program, and the CEL component was mandatory. For both courses, students participated in the CEL component in groups of four or five. Groups were partnered with local community-based organizations across the Greater Toronto Area, Canada. Students worked in collaboration with community partners to produce a deliverable that addressed a design need within the community. All deliverables represented typical work carried out within the discipline of UXD (e.g., website redesign, usability assessment of a user interface).

In this study, data were gathered at the completion of each respective course. Qualitative findings emerged from a thematic analysis of (1) transcripts of one-hour semi-structured interviews with community partners and (2) students' summative reflection assignments. Quantitative findings resulted from the analysis of student responses to a survey. A customized version of the survey was administered to community partners but is not presented in this paper due to the small sample size. The research underwent an ethics review and complied with informed consent procedures. Participants in the research were not compensated; participation and was entirely voluntary.

Participants

Students. A total of 101 students (49 from INF2170H, and 52 from INF2192H) participated in the study. All were graduate UXD students enrolled in the Master of Information program, who participated in the CEL component as a part of the courses.

INF2170H: Information Architecture (Fall 2018): A total of 101 students were enrolled in this course. Sixty-seven (67) out of 101 students (66.3%) chose to participate in CEL projects and were eligible to

participate in the research. Forty-nine (49) out of 67 eligible students (73.1%) consented to participate in the study and submitted summative reflections at the end of the semester. Forty-two (42) out of 49 students (85.7%) who consented completed the survey. The summative reflections of the seven students who did not complete the survey, but consented to participate in the study, were still used as data for the research.

INF2192H: Representing UX (Winter 2019): A total of 59 students were enrolled in this course. All 59 participated in CEL projects. The first author of this paper was also enrolled in the course, but her data set was excluded from the analysis. The remaining 58 students were eligible to participate in the study. Fifty-two (52) out of 58 eligible students (89.7%) consented to participate in the study and submitted summative reflections at the end of the semester. All 52 students who consented to participate in the research completed the survey. Table 1 presents the breakdown of the student participation in each of the two courses.

Table 1

Student Participants in Two Community-Engaged UXD Courses

	INF2170H	INF2192H
Total students enrolled	101	59
Students involved in a CEL project	67	59
Students consented to participate in the research	49	52
and submitted a summative reflection		
Consenting participants who completed the survey	42	52

Community Partners. A total of 22 individuals from 19 community partner organizations (11 individuals from organizations involved in INF2170H; 11 individuals from nine organizations involved in INF2192H) participated in the study through an interview. All community partner organization representatives who were interviewed had direct and constant interactions and engagement with the students. Some community partner organizations worked with two student groups simultaneously.

INF2170H: Information Architecture (Fall 2018): A total of 14 community partners participated in this course. Ten out of 14 (71.4%) consented to participate in the study. Eleven individuals from 10 community partner organizations agreed to participate in the interviews (one community partner organization had two individuals working with one group of students and both were interviewed).

INF2192H: Representing UX (Winter 2019): A total of nine community partners participated in this course, and all consented to participate in the research. Eleven individuals from nine community partner organizations agreed to participate in the interviews (one community partner organization had three individuals working with two groups of students, and all three were interviewed). Table 2 presents the breakdown of the community partner participation in each of the two courses.

Table 2

Community Partner Participants in Two Community-Engaged UXD Courses

	INF2170H	INF2192H
Total community partner organizations	14	9
Community partners organizations that consented	10	9
to participate in the research		
Individuals from consenting community partner	11	11
organizations who were interviewed		

Instruments and Data Collection

Student Reflection Assignments. Students completed a reflection assignment as a part of their last deliverable at the end of each respective semester. Students were asked to structure their reflections using the DEAL (Describe, Evaluate, and Articulate the Learning) framework (Ash & Clayton, 2009). The DEAL reflection assignment started with an objective and detailed description of a CEL experience by the student (expressed in the form of a "turning point"), followed by the student's evaluation of their learning, and concluded with an articulation of learning based on the student's CEL experience. Reflections were take-home assignments, which were submitted for grading.

Student Surveys. Outcomes of CEL engagement on students were measured using an adapted version of the CIS survey (Srinivas et al., 2015), which was administered online at the end of each respective semester and completed as part of the reflection assignment. A grade was assigned based on completion (complete/incomplete). The questions in the version of the survey in this study were grouped into the domains of diversity, social capital, skills and competencies, personal growth and self-concept, and overall experience. All domains except diversity were from the original CIS tool, which were added to capture the outcomes of CEL on the students' ability to empathize with members and/or users from the community (or stakeholders). Questions were also added in each category. Some of the newly added questions, primarily assessing UXD specific outcomes, were generated by the first author, while others were borrowed from the MacDonald and Rozaklis (2017) survey. Table 3 presents the breakdown of each of the five survey sections by the source of the questions.

Table 3

Student Survey Information

Dimensions	Added by first author	Borrowed from CIS	Borrowed from MacDonald & Rozaklis
Dimensions	mst aution	IIOIII CIS	MacDonald & Rozakiis
Diversity	5	_	—
Social Capital	1	4	_
Skills and Competencies	3	3	4
Personal Growth and Self-Concept	2	1	2
Overall Experience	1	2	3

Consent was obtained from the students to use their reflections and survey responses as data for this research. Data were anonymized and analyzed by the first author, who took no part in the grading of the assignments. No data analyses were undertaken until the courses were completed and final grades were submitted.

Community Partner Interviews. One-hour semi-structured interviews were conducted with the community partners from both courses at the end of each respective semester. The interviews were audio recorded by the first author. The interview questions were designed to address the research questions and included the following information: (1) Background and Description of the partnership experience and deliverables—to elicit meta-level information about the nature of the partnership and assess how the partnership was perceived by community partners; (2) Resources and Challenges—discussions on challenges community partners might have encountered throughout the partnership, and help generate recommendations for the improvement of future CEL initiatives; and (3) Understanding of UXD—to assess how CEL engagement affected community partners' understanding and perception of the value of UXD.

Qualitative Data Analysis

A general inductive approach was used to analyze the qualitative data, allowing for discovery rather than the imposition of ideas or theories (Given, 2008; Hey et al., 2014; Thomas, 2006). The community partner interviews were transcribed by the first author. Transcriptions were first processed using a transcription software and then verified for accuracy. Using NVivo 12, the first author coded the student reflections and community partner interviews for recurring themes. All identifying references were removed to protect the research participants, each of whom was assigned a participant ID. After the first pass through the data, the generated codes were grouped into themes, using the affinity diagramming method (Kolko, 2011). The second pass through the data ensured that the coding reflected the changes in the coding schema. The significance of each theme was evaluated based on the frequency of mentions of the theme among participants.

It is important to note that general inductive approach relies highly on the interpretations of the researcher (Thomas, 2006). To mediate the subjective nature of coding, the accuracy of the coding was verified via expert reviews of the coded transcripts. Four experts from the University of Toronto with extensive experiences in CEL projects and research reviewed the coded data. All reviewers commented on the richness of the data sets and the thoughtful and meticulous coding. Some experts commented on further defining the themes of "comfort with ambiguity" and "plans for implementation" as they relate to the disciple of UXD. Another expert pointed out that more clarification was needed regarding the theme of "communications." Overall, all reviewers agreed with the coded data themes. All comments received were taken into account and coding schemes were revised accordingly. Table 4 presents the final coding structure for the student reflections. Table 5 presents the final coding structure for the community partner interviews.

Quantitative Data Analysis

Student surveys were distributed online via an email link and were completed individually. The surveys data were collected anonymously, with respondents identified by ID numbers. The survey data were exported as Excel sheets with each question having the responses displayed by participant. Data generated by the Likert scale questions were processed by assigning numeric values to the responses. Questions were assigned whole number values from 1 to 5. Values of 1 were assigned to negative outcomes ("Very Unfavorable Impact" or "Strongly Disagree") and values of 5 were assigned to positive outcomes ("Very Favorable Impact" or "Strongly Agree"). The Likert scale responses were analyzed using SPSS and t-tests. Descriptive statistics were also tabulated. Responses have also undergone a Principal Component Analysis (PCA) using SPSS.

Results

Student Outcomes

Qualitative. An overwhelming majority of graduate students self-reported positive outcomes of CEL on the development of their interpersonal and UXD-specific skills, personal growth, and professional development. A majority of students referenced the development of interpersonal skills in their reflections, remarking that the CEL partnership experience gave them an opportunity to work on their professional communication skills, including providing regular updates to stakeholders, collaborating with peers, and "stepping outside of the UX mindset to convey usability ideas in everyday language" (P23, INF2170H). Some students reflected on the role of empathy in their CEL experience and their future as professionals. Much of the work that UXD professionals do consists of interaction with various user groups. Such work requires a great deal of empathy, open-mindedness, and cultural sensitivity. These skills align with dispositions for CEL students' engagement: open-mindedness, humility, appreciation of community cultural wealth, intellectual curiosity, empathy, and commitment (Donahue & Plaxton-Moore, 2018).

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Students also faced some challenges defining the scope of their profession and communicating the importance of UXD practices to the community partners who may not have been familiar with the discipline. Some students also reported that they struggled with providing timely updates and participant sourcing for UXD research, as well as maintaining a scope of work manageable for a 12-week semester. Despite these challenges, students remarked that, for example, the "initially frustrating experience became a learning experience" (P47, INF2170H).

Table 4

Coding Structure for Student Reflections in Two Community-Engaged UXD Graduate Courses

Code / Subcode	Theme
interpersonal skills professional communication collaboration with peers empathy challenge assumptions problem-solving listening storytelling	<i>General skills and competencies</i> Non-UXD-specific skills and competencies acquired by the students as a result of the CEL partnership
understanding of self assessing weaknesses assessing strengths avenues for improvement ethical practice	<i>Personal growth</i> Student learning outcomes pertaining to their understanding of self and their own value systems
professional identity scope of the profession	<i>Professional development</i> Personal growth pertaining to career outcomes
stakeholder engagement participant sourcing project scope management limited resources time management	<i>Challenges</i> Challenges faced and costs incurred over the course of CEL experiences
application of theory to real-world problems understanding of not-for-profit and/or public sector work future preparedness reciprocity	<i>Benefits</i> Beneficial outcomes resulting from CEL experiences
understanding of UXD process understanding of UXD methods perception of value of UXD	<i>Understanding of UXD</i> Understanding of UXD process, methods, and value
comfort with ambiguity in face of "wicked problems" deliverables communication of the value of UXD to stakeholders domain knowledge	UXD skills and competencies UXD-specific skills and competencies acquired by the students as a result of the CEL partnership

Table 5

Coding Structure for Community Partner Interviews in Two Community-Engaged UXD Graduate Courses

Cada / Subaada	Thoma
address an unmet need improve an offering	Motives for partnership Reasons organization entered into the CEL
access services normally not available	partnership with UXD students
research insights to support the allocation of resources	Outcomes
research insights to support the allocation of resources understanding of how people view the organization satisfaction with the final product external perspectives plans for implementation of deliverables already in use implementation underway no clear plan	<i>Outcomes</i> Larger organizational/personal outcomes that occurred as the result of the partnership
time and scheduling mismatch of expectations lack of competence unprofessional with users unresponsive to feedback lack of communication	<i>Costs of CEL partnerships</i> Negative outcomes of the CEL partnerships, and challenges/barriers faced by the community partners over the course of CEL projects
positive overall experience professionalism of students responsive to feedback good attitude/enthusiasm good communication student preparedness	<i>Benefits of CEL partnerships</i> Positive outcomes of the CEL partnerships
understanding of UXD methods process perception of value of UXD interest in UXD education	Understanding and perception of UXD Understanding of strengths and weaknesses of the user-centered design approach and how it could be applied in the organizational context acquired as a result of the CEL partnerships
research participant sourcing time and effort required to engage financial costs no major costs reported	UXD discipline-specific costs Costs associated with the implementation of UXD practices in the context of the organization
improved understanding of user needs ability to cater to multiple audiences accessibility getting everyone on board	<i>UXD discipline-specific benefits</i> Benefits of implementation of UXD practices in the context of the organization
clear schedule and requirements designated coordinator/point of contact longer timeframe for student engagement assistance with implementation regular updates remote meetings financial support for research	Suggestions for improvement Ways that the costs of CEL engagement could be reduced in future partnerships with university students

The following subthemes on the benefits of the CEL experiences emerged out of the students' reflections: (1) application of theory to real-world problems; (2) understanding of not-for-profit and/or public sector work; (3) future preparedness through exposure to real-world projects as an asset when interviewing for employment opportunities; (4) deeper understanding and appreciation of the value of UXD; and (5) experience managing the complexity of qualitative data collection and analysis. These themes allow for a better understanding of costs and benefits of CEL in the context of graduate UXD education.

Quantitative. Student survey responses underwent a PCA using SPSS. PCA is a statistical procedure used to identify or validate underlying constructs or dimensions in data. In this case, a dimension is a group of survey questions that measured a distinct aspect of the student experience. Student survey questions were designed to measure five different dimensions: (1) diversity, (2) social capital, (3) skills and competencies, (4) personal growth and self-concept, and (5) overall experience. The first four dimensions were not confirmed by the PCA. Two questions from the "overall experience" dimension made up the second component resulting from the PCA. The first dimension identified by the PCA contains 16 items that emerged with an eigenvalue > 1 and high internal consistency (Cronbach's Alpha = 0.9). Table 6 presents the full range of the results for the student surveys. Questions marked with an asterisk belong to the first dimension that emerged from the PCA.

Table 6

Summary of Student Survey Results¹

		INF2170H		INF2192H			All students			
#	Questions	n	Mean	SD	n	Mean	SD	n	Mean	SD
Di	versity	41	3.93	1.03	43	4.20	0.87	84	4.08	0.95
1	Understanding the challenges faced by people other than yourself when using the product(s) or service(s) you designed.*	42	4.07	0.99	51	4.45	0.75	93	4.28	0.88
2	Understanding of how the product(s) or service(s) you designed impact the users.*	42	3.88	0.91	51	4.24	0.73	93	4.08	0.83
3	Understanding of how to work with and engage various stakeholder groups.*	42	4.10	1.02	51	4.45	0.80	93	4.29	0.92
4	Understanding of how to work with and engage users from vulnerable user groups.	41	3.66	1.12	43	3.63	1.01	84	3.64	1.07
5	Ability to work with people from other socio-cultural backgrounds.*	42	3.93	1.03	48	4.15	0.79	90	4.04	0.92
So	cial Capital	41	3.56	1.00	46	3.77	0.80	87	3.67	0.90
6	Access to mentors and/or future employers.	41	3.17	0.85	46	3.22	0.81	87	3.20	0.83
7	Sense of community.	42	3.64	1.02	51	3.73	0.79	93	3.69	0.90
8	Internal dynamics of the organization and/or classroom.	42	3.79	0.91	50	3.96	0.66	92	3.88	0.79
9	Network of volunteers, friends, advocates, and/or allies.	41	3.54	0.97	47	3.81	0.82	88	3.68	0.90
10	Ability to make a difference in the community.*	42	3.64	1.11	51	4.08	0.65	93	3.88	0.91
Sk	ills and Competencies	41	4.00	1.00	49	4.33	0.69	90	4.22	0.86
11	Ability to work as part of a team.	42	4.00	1.15	51	4.63	0.48	93	4.34	0.91
12	Leadership or mentorship skills.	42	3.76	0.87	51	4.02	0.75	93	3.90	0.82
13	Ability to connect practical experience and academic research.*	42	4.17	0.95	51	4.39	0.60	93	4.29	0.78

		INF2170H		INF2192H			All students			
#	Questions	n	Mean	SD	n	Mean	SD	n	Mean	SD
14	Ability to create quality deliverables for clients.	42	3.95	0.97	51	4.45	0.64	93	4.23	0.84
15	Ability to interact with clients.*	41	4.17	1.06	51	4.43	0.63	92	4.32	0.86
16	Ability to work within time/resource constraints.*	42	3.93	1.06	51	4.27	0.66	93	4.12	0.88
17	Ability to manage the "messiness" of real- world projects.	42	3.86	1.04	51	4.33	0.73	93	4.12	0.91
18	Ability to consider the users in the product(s) or service(s) development process.*	41	4.20	0.92	51	4.43	0.66	92	4.33	0.80
19	Ability to engage users in the product(s) or service(s) development process.*	42	3.93	1.03	50	4.18	0.77	92	4.07	0.91
20	Ability to convey the importance of user experience design to stakeholders.*	41	4.07	0.87	49	4.18	0.72	90	4.13	0.79
Pe	rsonal Growth and Self-Concept	42	4.23	0.78	50	4.27	0.69	92	4.25	0.73
21	Understanding of your personal values.*	42	3.98	0.67	51	3.98	0.70	93	3.98	0.69
22	Confidence in applying user experience design methods.*	42	4.26	0.79	51	4.39	0.63	93	4.33	0.71
23	Interest in user experience design.*	42	4.40	0.73	51	4.33	0.76	93	4.37	0.74
24	Commitment to engaging users in the product(s) or service(s) development process.*	42	4.19	0.82	50	4.20	0.63	92	4.20	0.73
25	Appreciation of the value of the user experience design process.	42	4.33	0.81	51	4.45	0.60	93	4.40	0.71
Ov	erall Experience	40	4.08	0.84	47	4.21	0.69	89	4.15	0.77
26	This community-engaged learning partnership contributed to my understanding of the process of user experience design.	42	4.38	0.75	51	4.31	0.58	93	4.34	0.66
27	I have applied what I learned from this community-engaged learning experience in other coursework or in my professional work.	42	4.00	0.79	47	4.02	0.81	89	4.01	0.80
28	After participating in this community- engaged learning experience, I feel more prepared for employment in the user experience design field.	40	3.85	0.69	51	4.18	0.71	91	4.03	0.72
29	My participation in a client-facing user experience design project(s) has made me more marketable to employers.	40	3.95	0.74	51	4.14	0.69	91	4.05	0.72
30	This community-engaged learning experience was positive.	42	4.21	0.94	51	4.31	0.58	93	4.27	0.76
31	This community-engaged learning experience is mutually beneficial for all who took part.*	42	4.07	0.99	51	4.29	0.72	93	4.19	0.86

Note. ¹ 'n' values are not consistent because not all student survey participants answered all the survey questions. 1–Very Unfavorable Impact; 2–Unfavorable Impact; 3–Neutral/No Impact; 4–Favorable Impact; 5–Very Favorable Impact **or** 1–Strongly Disagree; 2–Disagree; 3–Neutral; 4–Agree; 5–Strongly Agree Quantitative findings emerging from student surveys provide insight into which areas the students identified as the most positively impacted by the CEL experiences.

Community Partner Outcomes

A thematic analysis of partner interviews uncovered several themes pertaining to outcomes, costs, benefits, and UXD-specific learning outcomes of CEL engagement in both courses. The majority of community partners remarked that students generated research insights that justified the allocation of resources toward implementation of the design recommendations made by students. Community partners valued the opportunity to have an external perspective on their organization from the point of view of their users and UXD students, and they remarked that it "uncovered different things that we did not consider" (Partner 9, INF2170H). Some of the costs of the CEL partnership for the partners included the time required to support the students: "There was a very tight turnaround. And so that required me to reorganize my time so that I can make sure that I was able to get the resources that the group needed all through the project." (Partner 4, INF2170H)

In-person meetings and email correspondence with the students made additional demands on the community partners' time. The partners remarked that the value of the partnership was directly correlated with the time they dedicate to it. Some community partners expressed regret in not having been able to spend the necessary time. It is also important to recognize that students may not always be successful in their application of theoretical concepts and techniques within the context of the community partner organization. The levels of students' professional competence presented challenges to one of the community partners. This risk may be mitigated through intense preparation prior to the CEL engagement but cannot be eliminated. Despite the challenges, the majority of the community partners felt they received valuable deliverables, given the time invested in their partnership, and remarked on student enthusiasm and professionalism.

There was a wide range in familiarity with the discipline of UXD among the community partners. More than half had some degree of familiarity with UXD before beginning the partnership. Regardless of initial levels of familiarity, a number of community partners were able to gain a deeper understanding of the UXD process, methods, terminology, and applications as illustrated by the following quotation:

I already always knew that it was a valuable perspective to take, especially when you're designing something that is public-facing or user-facing, but I didn't have the tools for how you would go about to do that. And I also didn't have the capacity. They gave me a better understanding of what it is, so that I could imagine potentially using it in the future, but [it] also show me what the product could look like once you went through that process. (Partner 6, INF2170H)

Working with the students helped community partners see the value of the UXD approach. A number of community partners mentioned that catering to multiple distinct audiences (e.g., donors, volunteers, or clients) presented a challenge for their organization. The students' UXD approach and UXD research provided an understanding of each unique audience, which allowed for effective communication. Some community partners expressed the desire to take UXD courses as a result of the partnership. This is an instance of an outcome that may create a longer-term impact on the organization, shifting it towards a more user-centered practice.

In contrast to all the positive themes outlined above, the time required to support the students over the course of the CEL partnerships was identified as a persisting challenge for most community partners. Through the open discussion regarding the costs of CEL and ways to mitigate them, the community partners made the following suggestions to improve future CEL initiatives:

(1) Upfront breakdown of schedule and requirements—Clear schedule and requirements are needed to be made available to organizations early in the partnership: "The only thing I probably would have appreciated, because we are a very small organization and also very busy, is to have more of a heads up when their deliverables were due, just so we can plan accordingly." (Partner 2, INF2170H)

(2) *Designated coordinator/point of contact*—Prior to the start of the partnership, the student groups were instructed to have one point of contact to facilitate communication. The community partners appreciated establishing this so they "weren't getting questions from all directions" (Partner 18, INF2192H).

(3) Longer timeframe for student engagement—Partners mentioned a preference for longer-term engagement, allowing more time to help students source participants (by recruiting members of their community and/or users of their products or services) for research activities: "I only wish that the timeframe would be a little longer so that we can go through and to drill down to the next level in terms of actually bringing this to fruition." (Partner 3, INF217H)

(4) Assistance with implementation of student recommendations—Some community partner organizations did not have time or resources to implement the designs proposed by the students, and would value a ready-to-use solution at the completion of the partnership: "If someone could have come to me with a plug and play, that would have been great!" (Partner 8, INF217H).

(5) *Regular updates*—Some partners identified the lack of structure for updates as problematic and wished there was "a way for us to meet more consistently throughout the week" (Partner 11, INF217H). One community partner suggested implementing weekly or semimonthly progress updates with the team.

(6) *Remote meetings*—Some partners preferred the convenience of online meetings and mentioned that "there is a lot that we could have done online as opposed to in person" (Partner 20, INF2192H), as it would be less demanding on their time than in-person meetings.

(7) *Financial support for research*—Community partners would benefit from financial support to help carry out UXD research activities such as reimbursement of UXD research participants (Partner 20, INF2192H).

The themes that emerged from the analysis of community partners' interviews allow for a better understanding of the positive outcomes of CEL as well as challenges faced by the community partners while working with UXD students. The recommendations provided can help improve future CEL partnerships.

Discussion

The study presented in this paper sheds some light on the short-term student and community partner outcomes of community-engaged, project-based UXD courses. Through the investigation of CEL engagement in two graduate-level UXD courses, we outlined the short-term outcomes of CEL partnerships on students and community partners. More specifically, we answered the three research questions.

Both the quantitative and qualitative results suggest that CEL in UXD courses provides the following short-term student learning outcomes: (1) development of interpersonal skills, including professional communication; (2) empathy; and (3) UXD-specific skills. These outcomes are consistent with the findings of MacDonald and Rozaklis's (2017) study. The similarity between findings provides preliminary evidence that the introduction of CEL engagement in UXD education is a way to help students apply theory to practice and embark on the "concrete experience" stage of the experiential learning cycle (Kolb & Kolb, 2017). The CEL experiences provided an opportunity for students to apply their theoretical knowledge of UXD methods in the settings of community partner organizations.

One particular aspect of UXD CEL pedagogy in this study was the project-based nature of the engagement. Students were given a specific problem to solve (e.g., redesigning a website), and they focused on solving that problem. The PBSL model (Hettche & Clayton, 2013) was well suited for the types of projects students had to complete in both courses. In following the PBSL model, the UXD students began their partnership by working with the community partner to understand and define a problem that the organization was facing, ensuring that the deliverables of their CEL partnership were tailored to the organization's needs. The nature of the projects may have influenced the outcomes that

students decided to focus on (e.g., focusing on developing particular UXD skills). This reinforces the disciplinary differences in the application of CEL (Butin, 2006).

Our evaluation of CEL engagement in UXD courses would not be complete without considering community partners' experiences and answering the research question focused on the short-term outcomes and perceived costs and benefits of UXD CEL engagement for students and community partners. The community partners mentioned two benefits of working with UXD students: (1) valuable deliverables; and (2) well-documented research insights that catalyzed the allocation of funding towards development of products and services within their organization (e.g., a website update). Some community partners noted the benefits that students' enthusiasm, external perspectives, and commitment during and beyond the timeframe of engagement brought to their organization.

The observed costs of UXD CEL partnerships in this paper are aligned with those in other studies focused on community partner's perspectives on CEL engagement. For example, time and effort required of the community partners was the most frequently mentioned cost of CEL engagement and is often a prevalent theme in CEL research in other disciplines (Brudney & Russell, 2016). However, our findings also suggest that partners who dedicated time and resources to the students were more satisfied with the results of the partnership. This brings us back to the role of reciprocity in CEL: "The experience depends on the willingness of the community partner to dedicate resources and provide access, taking a chance on students' abilities and their dedication to carrying out a planned project" (Bennet, 2018, p. 2). Reciprocity can also take the form of engaging the community partner in the course planning or sharing course schedule and requirements ahead of time.

This research contributes recommendations that may help faculty members and administrators better plan and manage CEL courses. Even through short-term engagement, the research findings suggest that by collaborating with the students, the community partners learned aspects of the UXD process and gained familiarity with some of UXD methods that the students applied in their work.

This study has contributed to the scholarship on CEL as well as the UXD pedagogy literature. Three specific contributions of this paper are as follows: (1) preliminary evidence of the effectiveness of CEL engagement in generating positive learning outcomes for UXD students; (2) recommendations for the improvement of future CEL initiatives; and (3) preliminary evidence of the effectiveness of CEL in increasing awareness of the discipline of the UXD field and heightened capacity to address the needs of the larger community among community partners.

Limitations and Future Work

There are limitations to this study in terms of scope, design, and sampling of students and partners, namely: (1) Students and partners were able to report on only short-term outcomes of their CEL experience; (2) findings pertaining to student competencies as well as community partners' understanding of UXD were self-reported and as such might not reflect the reality; (3) while the survey results show acceptable levels of reliability, the lack of a control group prevents any inferences from being drawn; (4) this research investigates only short-term outcomes of CEL engagement. More evaluative research needs to be conducted on the long-term impacts and effectiveness of CEL in UXD.

Conclusion

The research presented in this paper focused on evaluating CEL initiatives within the discipline of UXD. The findings improve our understanding of student and community partner perspectives on the short-term costs, benefits, and outcomes of CEL in the context of UXD education. The research results indicate largely positive outcomes for CEL on student learning. The student outcomes largely align with those found in previous studies with UXD students (MacDonald & Rozaklis, 2017). Students self-reported that they improved on a wide range of interpersonal skills, which is a commonly observed student outcome in CEL research (Bielefeldt et al., 2010, Hey et al., 2014, MacDonald & Rozaklis, 2017).

Additionally, this research confirms the need for both theoretical and practical components in UXD education (Getto & Beecher, 2016; Gray, 2015; Vorvoreanu et al., 2017). The theme of "application of theory to real-world problems" that emerged in this study was consistent with findings of CEL studies that produced the themes of "how to use and apply UX methods in a real-world setting" (MacDonald & Rozaklis, 2017, p. 273) and the value of "real-world experience" highlighted by engineering students (Bielefeldt et al., 2010, p. 540). Exposure to challenges of working in community organizations also provided students with an opportunity to develop interpersonal skills and increased empathy for users of their products and services.

CEL engagement elicited a largely positive response from community partners. The research results show that all the community partner organizations that participated in this research had plans to implement, or had started implementing, the design of their CEL partnership and were open to new CEL partnerships in the future. The community partners gained a better understanding of UXD process and methods and were able to evaluate the costs and benefits of taking a UXD approach within the context of their organization.

In addition, longitudinal research needs to be conducted with all parties involved in CEL courses, including faculty and staff. The tools and results presented in this study may be useful for validation of future CEL UXD research.

References

Adams, T. L., & Welsh, S. (2008). *The organization and experience of work*. Nelson College Indigenous. Ash, S. L., & Clayton, P. H. (2009). Generating, deepening, and documenting learning: The power of

- critical reflection in applied learning. *Journal of Applied Learning in Higher Education*, *1*(1), 25–48. Bennett, E. (2018). A simple, practical framework for organizing relationship-based reciprocity in
- service-learning and Community Engagement, 6(1), Article 2.
- Bielefeldt, A. R., Paterson, K. G., & Swan, C. W. (2010). Measuring the value added from service learning in project-based engineering education. *International Journal of Engineering Education*, 26(3), 535–546.
- Brudney, J. L., & Russell, A. R. (2016). Hours aren't enough: new methodologies for the valuation of community-engaged learning. *Nonprofit Management & Leadership*, 26(3), 277–293. <u>https://doi.org/10.1002/nml.21193</u>
- Blouin, D. D., & Perry, E. M. (2009). Whom does service learning really serve? Community-based organizations' perspectives on service learning. *Teaching Sociology*, 37(2), 120–135. <u>https://doi.org/10.1177/0092055X0903700201</u>
- Butin, D. (2006). The limits of service-learning in higher education. *The Review of Higher Education*, 29(4), 473–498. <u>https://doi.org/10.1353/rhe.2006.0025</u>
- Campus Compact. (2015). Problem-based service-learning (PBSL). Campus Compact. <u>https://compact.org/initiatives/syllabi/syllabi-introduction-page-3/problem-based-service-learning-pbsl/</u>

Deeley, S. J. (2015). Critical perspectives on service-learning in higher education. Palgrave Macmillan.

- Dewey, J. (1938). Experience and education. Simon & Schuster.
- Donahue, D. M., & Plaxton-Moore, S. (2018). *The student companion to community-engaged learning: What you need to know for transformative learning and real social change.* Stylus Publishing.
- Furco, A. (1996). Service-learning: A balanced approach to experiential education. In B. Taylor & Corporation for National Service (Eds.), *Expanding boundaries: Serving and learning* (pp. 2–6). Corporation for National Service.

- George-Paschal, L.A., Hawkins, A., & Graybeal, L. M. (2019). Investigating the overlapping experiences and impacts of service-learning: Juxtaposing perspectives of students, faculty, and community partners. *Michigan Journal of Community Service-Learning*, 25(2), 43–61. <u>https://doi.org/10.3998/mjcsloa.3239521.0025.203</u>
- Getto, G., & Beecher, F. (2016). Toward a model of UX education: Training UX designers within the academy. *IEEE Transactions on Professional Communication*, *59*(2), 153–164. https://doi.org/10.1109/TPC.2016.2561139
- Given, L. M. (2008). *The SAGE encyclopedia of qualitative research methods* (Vol. 2). SAGE Publications.
- Gray, C. M. (2015). Critiquing the role of the learner and context in aesthetic learning experiences. In B. Hokanson, G. Clinton, & M. Tracey (Eds.) *The design of learning experience: Creating the future of educational technology* (pp. 199–213). Springer International Publishing. <u>https://dx.doi.org/10.1007/978-3-319-16504-2_14</u>
- Gunn, A., & Mintrom, M. (2018). Measuring research impact in Australia. *Australian Universities Review*, 60(1), 9–15. <u>https://doi.org/10.1186/s12961-017-0180-1</u>
- Hatcher, J. A., & Bringle, R. G. (1997). Reflection: Bridging the gap between service and learning. *College Teaching*, 45(4), 153–158. <u>https://doi.org/10.1080/87567559709596221</u>
- Hettche, M., & Clayton, M. (2013). Web site design and content management analysis: Opportunities for service-learning projects. *Journal of Advertising Education*, 17(1), 26–35. <u>https://doi.org/10.1177/109804821301700105</u>
- Hey, D. W., Slivovsky, L. A., Self, B. P., Widmann, J., & Taylor, J. K. (2014). Learning design through the lens of service: A qualitative study. *International Journal for Service Learning in Engineering*, *Humanitarian Engineering and Social Entrepreneurship*, 9(1), 1–23. https://doi.org/10.24908/ijsle.v9i1.5257
- Jacoby, B. (2015). Service-learning essentials: Questions, answers, and lessons learned. Jossey-Bass.
- Kolb, A. Y., & Kolb, D. A. (2017). *The experiential educator: Principles and practices of experiential learning*. EBLS Press.
- Kolko, J. (2011). *Exposing the magic of design: A practitioner's guide to the methods and theory of synthesis.* Oxford University Press.
- Littlepage, L., Gazley, B., & Bennett, T. A. (2012). Service learning from the supply side: Community capacity to engage students. *Nonprofit Management and Leadership*, *22*(3), 305–320. <u>https://doi.org/10.1002/nml.20056</u>
- Loseke, D. R., & Cahill, S. E. (1986). Actors in search of a character: Student social workers' quest for professional identity. *Symbolic Interaction*, 9(2), 245–258. <u>https://doi.org/10.1525/si.1986.9.2.245</u>
- MacDonald, C. M., & Rozaklis, L. (2017). Assessing the implementation of authentic, client-facing student projects in user experience (UX) education: Insights from multiple stakeholders. *Proceedings* of the 80th Annual Meeting of the Association for Information Science & Technology (pp. 268–278). https://doi.org/10.1002/pra2.2017.14505401030
- Ramaley, J. (2000). Strategic directions for service-learning research: A presidential perspective. Michigan Journal of Community Service Learning, Special Issue, 91–97. <u>https://hdl.handle.net/2027/spo.3239521.spec.112</u>
- Schön, D. A. (1983). The reflective practitioner: How professionals think in action. Basic Books.
- Simmer-Beck, M., Keselyak, N. T., Branson, B., & Mitchell, T. V. (2013). Measuring the short-term effects of incorporating academic service learning throughout a dental hygiene curriculum. *International Journal of Dental Hygiene*, 11(4), 260–266. https://doi.org/10.1111/idh.12015
- Srinivas, T., Meenan, C. E., Drogin, E., & DePrince, A. P. (2015). Development of the community impact scale measuring community organization perceptions of partnership benefits and costs. *Michigan Journal of Community Service Learning*, 21(2), 5–21. https://hdl.handle.net/2027/spo.3239521.0021.201
- Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation*, 27(2), 237–246. <u>https://doi.org/10.1177/1098214005283748</u>

Vorvoreanu, M., Gray, C. M., Parsons, P., & Rasche, N. (2017). Advancing UX education: A model for integrated studio pedagogy. *CHI'17: Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (pp. 1441–1446). ACM Press. <u>https://doi.org/10.1145/3025453.3025726</u>
Weigert, K. M. (1998). Academic service learning: Its meaning and relevance. *New Directions for Teaching and Learning*, *1998*(73), 3–10. <u>https://doi.org/10.1002/tl.7301</u>

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