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Examining the Efficacy of E-Service-Learning

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E-service-learning is a pedagogical technique in which instruction and/or service occur online. Students in a distance learning section of Atypical Development created a Google Site with resources for individuals with developmental disabilities. Additionally, students met with youths with developmental disabilities biweekly via Blackboard Collaborate Ultra sessions. At the end of the semester, students completed a questionnaire assessing their e-service-learning experience and wrote reflection papers. Students reported that the e-service-learning experience was related to course content, increased their understanding of individuals with disabilities, increased student engagement, helped them relate the subject matter to everyday life, positively impacted their future academic and career choices, and overall had a positive experience. Students in a traditional face-to-face section of Atypical Development who completed an in-person service-learning project did not significantly differ on any of the aforementioned questionnaire measures. Interestingly, students in the distance learning section reported in their reflection papers that the e-service-learning experience reduced their levels of anxiety. Course evaluations were also examined for both sections. Students in the e-service-learning section reported greater satisfaction than the in-person service-learning course. Specifically, e-service-learning students reported: the instructor attempted to make the course relevant to students; the assignments helped me learn the subject matter; I enjoyed the class greater than students in the in-person service-learning course. These results indicate that e-service-learning is an efficacious pedagogical practice in distance learning courses.

Keywords: applied learning, community engagement, experiential learning, service-learning, student engagement

INTRODUCTION

Service-learning is a collaborative teaching and learning strategy that fosters academic achievement, personal growth, and civic engagement (Miller, 2020). Service-learning is associated with an array of cognitive, psychological, and social benefits. Students who participate in service-learning experiences develop enhanced metacognitive skills, better strategic planning, and the ability to discriminate between useful and insignificant information (Clevenger and Ozbek, 2013). Service-learning activities also boost students' self-esteem and self-efficacy (Conway et al., 2009), and increase students' teamwork and leadership skills (Shephard, 2008). Service-learning is also positively associated with a variety of diversity outcomes, such as increasing students' awareness of diversity (Simons and Cleary, 2006), multicultural competence (Einfeld and Collins, 2008), and global perspective-taking (Engberg and Fox, 2011).

Service-learning is classified as a high-impact practice in higher education (Kuh, 2008). Service-learning increases student retention and student engagement. Moreover, students benefit from service-learning experiences across the curriculum (Figuccio, 2020). Due to the overwhelming evidence in support of service-learning as an effective pedagogical practice, it has been argued that service-learning is the most potent pedagogy for developing well-rounded psychologically literate citizens (Bringle et al., 2016).

Unfortunately, a number of service-learning practitioners view the online environment as a barrier to service-learning (Waldner et al., 2012). The growth of the online student body has exceeded the growth of on-site students. As of Fall 2016, students taking at least one distance education course, comprised 31.6% of all higher education enrollments (Seaman et al., 2018). As more students pursue online education, service-learning must adapt in order to remain viable. E-service-learning is "an integrative pedagogy that engages learners through technology in civic inquiry, service, reflection and action" (Dailey-Hebert and Donnelli, 2010, p. 1). The online environment may be a facilitator of e-service-learning. E-service-learning removes geographical constraints and provides online learning with a tool to promote engagement.

E-service-learning is a relatively new pedagogical practice. As distance learning is growing in popularity, it is likely e-service-learning will be implemented more broadly. Unlike service-learning, however, e-service-learning has not been extensively studied and evaluated. The aim of the current study is to examine the efficacy of e-service-learning. It is hypothesized that students will report similar benefits of e-service-learning and service-learning experiences.

MATERIALS AND METHODS

Participants

Fifty-eight students attending Farmingdale State College ($M = 21.66$ years, $SD = 1.73$) participated in the current study. 87.9% of students identified as female, and 20.7% of students identified as Hispanic. Additionally, 72.4% of students identified as White, 13.8% of students identified as African American, 6.9% of students identified as Other, 1.7% of students identified as Asian, and 5.2% of students did not report their race. Students were enrolled in an either a traditional face-to-face section of Atypical Development ($N = 33$) or a distance learning section of Atypical Development ($N = 25$). To minimize group differences, both sections were taught by the same instructor. Groups did not differ in terms of age ($t = 0.17$, $p = 0.868$), sex ($\chi^2 = 1.07$, $p = 0.585$), or race ($\chi^2 = 2.00$, $p = 0.573$). The current study was approved by the Farmingdale State College Institutional Review Board.

Community Partner

Commonpoint Queens is a social services organization that meets the diverse and evolving needs of individuals in Queens and Nassau, New York. Commonpoint Queens is a place where people of all ages and backgrounds come together to find support, access opportunities, and build connections to community throughout their lives. Guided by the Jewish values of service and justice, Commonpoint Queens was founded to support the local Jewish community, which it continues to do today. Over the past 60 years, Commonpoint Queens has extended its reach, and currently provides childhood programs, summer camp, senior services, mental health resources, support during crisis, wellness, and everything in between at over 50 sites. Commonpoint Queens provides extensive services for individuals with developmental disabilities (DD).

Service-Learning Project Description

Students in the traditional face-to-face section of Atypical Development participated in a service-learning project at the Sam Field Center of Commonpoint Queens located in Little Neck, NY. Students were paired with youths with various DD. Youths with DD presented with mild to severe impairments and ranged from 6- to 21-years-of-age. College students and students with DD were instructed to work together to create a mural. College students and students with DD were also given "free time" to participate in semi-structured activities of their choosing. The student learning objectives of the service-learning experience were to: (1) Apply course concepts to everyday life; (2) Demonstrate an understanding of various developmental disabilities; (3) Examine the unique needs of individuals with disabilities.

Students in the distance learning section of Atypical Development participated in an e-service-learning project. Students worked in small groups and created resources for youths with DD. Youths with DD were enrolled in afterschool programming at the Sam Field Center of Commonpoint Queens. Youths with DD presented with mild to severe impairments and ranged from 14- to 21-years-of-age. The resources were designed to address challenges for youths with developmental disabilities as they transition from school-based to adult-based services. The focus of this project was determined as a result of a gap in the community partner's current programmatic offerings. Although the community partner has robust programmatic offerings for children and adults with DD, there are fewer programs for adolescents and young adults. During this critical period, youths are transitioning out of school-based programming and entering the workforce. To address this gap, seven modules were created: Icebreakers, Social Skills, Fostering Resilience, Bullying, Navigating Public Transit, Job Search, and Interviewing. Students met with youths with developmental disabilities biweekly via Blackboard Collaborate Ultra Sessions. Additionally, students created a Google Site which youths with developmental disabilities could reference in the future. Students in both sections wrote reflection papers after they completed their respective projects. Time was also allotted in class to allow the college students to debrief, which provided more meaning and context to the service-learning and e-service-learning exercises.

Data Collection and Analysis

After completing the service-learning project, college students completed a questionnaire assessing their experiences on a five-point Likert scale. Unfortunately, a similar questionnaire could not be used to assess the experience of students with

DD as not all students had sufficient cognitive and/or verbal abilities. A research assistant administered the questionnaire and deidentified college student responses. Standardized course evaluations were also completed. Course evaluations were administered anonymously via Axiom Mentor v3.1.259. Additionally, random sample of student reflection papers were coded by a research assistant. IBM Statistical Package for Social Sciences (SPSS) version 26.0.0.0 was employed for data analysis. Since Likert-scale rating consist of ordinal data, non-parametric statistics were employed (Nanna and Sawilowsky, 1998). Medians and ranges were utilized to assess students' service-learning and e-service-learning experiences. Mann-Whitney U tests were employed to assess whether students in traditional face-to-face and distance learning sections differed in their reported experiences. Chi-square tests were utilized to compare reflection paper coded responses between the traditional face-to-face and distance learning sections.

RESULTS

Questionnaire

Students in both traditional face-to-face and distance learning sections of atypical development reported positive experiences as a result of their respective service-learning and e-service-learning activities. Students in the face-to-face section indicated that the service-learning project was related to course content ($Mdn =$ 5.00, $Ra = 1$). Additionally, students reported that the service-learning project enhanced their understanding of individuals with developmental disabilities ($Mdn = 5.00$, $Ra = 2$). Students also stated that the service-learning project increased student engagement ($Mdn = 5.00$, $Ra = 2$). Moreover, students indicated that the service-learning project helped them understand the relevance of the course to their everyday life ($Mdn = 5.00$, $Ra = 2$). Students also reported that the service-learning project had a positive impact on their future academic and career choices ($Mdn = 5.00$, $Ra = 2$). Lastly, students stated they had an overall positive experience participating in the service-learning project ($Mdn = 5.00$, $Ra = 2$).

Students in the distance learning section indicated that the e-service-learning project was related to course content ($Mdn =$ 5.00, $Ra = 2$). Additionally, students reported that the e-service-learning project enhanced their understanding of individuals with developmental disabilities ($Mdn = 5.00$, $Ra = 2$). Students also stated that the e-service-learning project increased student engagement ($Mdn = 5.00$, $Ra = 3$). Moreover, students indicated that the e-service-learning project helped them understand the relevance of the course to their everyday life ($Mdn = 5.00$, $Ra = 2$). Students also reported that the e-service-learning project had a positive impact on their future academic and career choices ($Mdn = 5.00$, $Ra = 3$). Lastly, students stated they had an overall positive experience participating in the e-service-learning project ($Mdn = 5.00$, $Ra = 2$).

Table 1 compares student questionnaire responses in traditional face-to-face and distance learning sections of Atypical Development. Students in the traditional face-to-face and a distance learning sections did not significantly differ on any of their questionnaire responses. Specifically, a Mann-Whitney test

indicated that students in face-to-face ($Mdn = 5$) and distance learning ($Mdn = 5$) sections do not differ in their report that the service-learning project was related to course concepts $U = 382.50$, $p = 0.504$. Additionally, a Mann-Whitney test indicated that students in face-to-face ($Mdn = 5$) and distance learning ($Mdn = 5$) sections do not differ in their report that the service-learning project helped them apply the course's subject material to their everyday $U = 348.50$, $p = 0.140$. A Mann-Whitney test also indicated that students in face-to-face ($Mdn = 5$) and distance learning ($Mdn = 5$) sections do not differ in their report that the service-learning project assisted in their understanding of developmental disabilities $U = 318.50$, $p = 0.059$. Additionally, a Mann-Whitney test also indicated that students in face-to-face ($Mdn = 5$) and distance learning ($Mdn = 5$) sections do not differ in how the service-learning project facilitated student engagement $U = 360.50$, $p = 0.214$. Additionally, a Mann-Whitney test indicated that students in face-to-face ($Mdn = 5$) and distance learning ($Mdn = 5$) sections do not differ in how the service-learning project affected future academic and career choices $U = 370.50$, $p = 0.433$. Lastly, a Mann-Whitney test indicated that students in face-to-face ($Mdn = 5$) and distance learning ($Mdn = 5$) sections do not differ in their overall service-learning experience $U = 360.50$, $p = 0.246$.

Course Evaluations

Students in both face-to-face and distance learning sections of Atypical Development completed course evaluations at the end of the semester. Students in a face-to-face section reported that the instructor attempted to make the course relevant to students ($Mdn = 5.00$, $Ra = 2$). Students in a face-to-face section also reported that the assignments helped me learn the subject matter ($Mdn = 5.00$, $Ra = 2$). Students in a face-to-face section also reported that I learned a great deal from this course ($Mdn = 5.00$, $Ra = 2$). Students in a face-to-face section reported that overall, I would rate this course highly ($Mdn = 5.00$, $Ra = 2$). Students in a face-to-face section also reported that I enjoyed this class ($Mdn = 5.00$, $Ra = 3$). Lastly, students in a face-to-face section reported that overall, I would rate the instructor highly ($Mdn = 5.00$, $Ra = 4$).

Students in a distance section of Atypical Development reported that the instructor attempted to make the course relevant to students ($Mdn = 5.00$, $Ra = 0$). Students in a face-to-face section also reported that the assignments helped me learn the subject matter ($Mdn = 5.00$, $Ra = 0$). Students in a face-to-face section also reported that I learned a great deal from this course ($Mdn = 5.00$, $Ra = 2$). Students in a face-to-face section reported that overall, I would rate this course highly ($Mdn = 5.00$, $Ra = 1$). Students in a face-to-face section also reported that I enjoyed this class ($Mdn = 5.00$, $Ra = 1$). Lastly, students in a face-to-face section reported that overall, I would rate the instructor highly ($Mdn = 5.00$, $Ra = 1$).

Table 2 compares student course evaluation responses in traditional face-to-face and distance learning sections of Atypical Development. Interestingly, a Mann-Whitney U test indicated that students in a distance learning section ($Mdn = 5.00$) reported that the instructor attempted to make the course relevant to students greater than students in a face-to-face (Mdn

TABLE 1 | Service-learning questionnaire students' responses.

Item	Service-learning		E-service-learning			
	Mdn	*Ra*	*Mdn*	*Ra*	**Mann-Whitney *U***	*p*
Course content	5.00	1	5.00	2	382.50	0.504
Understanding of individuals with disabilities	5.00	2	5.00	2	348.50	0.14
Student engagement	5.00	2	5.00	3	318.50	0.059
Application to everyday life	5.00	2	5.00	2	360.50	0.214
Future academic and career choices	5.00	2	5.00	3	370.50	0.433
Overall experience	5.00	2	5.00	2	360.50	0.246

Students in a face-to-face (service-learning) section are compared with students in a distance learning (e-service-learning) section.

TABLE 2 | Course evaluation students' responses.

Item	Service-learning		E-service-learning			
	Mdn	*Ra*	*Mdn*	*Ra*	**Mann-Whitney *U***	*p*
Relevant	5.00	2	5.00	0	49.50	0.011**
Assignments	5.00	2	5.00	0	49.50	0.011**
Learn	5.00	2	5.00	2	85.00	0.564
Couse	5.00	2	5.00	1	70.00	0.147
Enjoy	5.00	3	5.00	1	56.50	0.034**
Instructor	5.00	4	5.00	1	67.00	0.226

*Students in a face-to-face (service-learning) section are compared with students in a distance learning (e-service-learning) section. **p < 0.05.*

= 5.00) section $U = 49.50$, $p = 0.011$. Furthermore, a Mann-Whitney U test indicated that students in a distance learning section ($Mdn = 5.00$) reported that the assignments helped me learn the subject matter greater than students in a face-to-face ($Mdn = 5.00$) section $U = 49.50$, $p = 0.011$. A Mann-Whitney U test also indicated that students in a distance learning section ($Mdn = 5.00$) reported that I enjoyed this class greater than students in a face-to-face ($Mdn = 5.00$) section $U = 67.00$, $p = 0.034$. A Mann-Whitney U test indicated that students in a distance learning section ($Mdn = 5.00$) and a face-to-face ($Mdn = 5.00$) section do not significantly differ in their response to I learned a great deal from this course section $U = 85.00$, $p = 0.564$. A Mann-Whitney U test also indicated that students in a distance learning section ($Mdn = 5.00$) and a face-to-face ($Mdn = 5.00$) section do not significantly differ in their response to overall, I would rate this course highly $U = 70.00$, $p = 0.147$. Lastly, a Mann-Whitney U test indicated that students in a distance learning section ($Mdn = 5.00$) and a face-to-face ($Mdn = 5.00$) section do not significantly differ in their response to overall, I would rate the instructor highly $U = 67.00$, $p = 0.226$.

Reflection Papers

After reviewing the reflection papers, the following themes emerged: application to future career, increased knowledge and respect for individuals with developmental disabilities, and reduced levels of anxiety. A random sample of 24 reflection papers were selected from the traditional face-to-face and distance learning sections. A chi-square test of independence was preformed to examine the relation between future career and course format. The relation between these variables was

not significant, $\chi^2_{(1,N=24)} = 3.00$, $p = 0.083$. A chi-square test of independence was also preformed to examine the relation between knowledge and respect for individuals with developmental disabilities and course format. The relation between these variables was not significant, $\chi^2_{(1,N=24)} = 0.00$, $p = 1.000$. Lastly, chi-square test of independence was preformed to examine the relation between anxiety level and course format. The relation between these variables was significant, $\chi^2_{(1,N=24)} = 6.17$, $p = 0.013$. Students in a distance learning section reported lower levels of anxiety than students in a traditional face-to-face section.

DISCUSSION

Students in face-to-face and distance learning sections of Atypical Development reported similar learning outcomes. Specifically, students in service-learning and e-service-learning conditions did not significantly differ in their responses to the service-learning questionnaire. Interestingly, students indicated via course evaluations that the e-service-learning condition was more relevant to the course, more useful in learning course material, and more enjoyable than the students in the service-learning condition. Students in the e-service-learning condition also reported in their reflection papers that they experienced reduced levels of anxiety which may be attributed to the distance learning format.

The hypothesis that that students will report similar benefits of e-service-learning and service-learning experiences was supported. Every effort was made to minimize any differences

between the face-to-face and distance learning sections. The same instructor taught both the face-to-face and distance learning sections. Additionally, the course content was identical in both sections. Exams were also the same in both sections. The only difference between the face-to-face and distance learning sections was the specific service-learning activity.

A major criticism of online teaching and learning is that there is a lack of student interaction and engagement. E-service-learning overcomes this key limitation (Waldner et al., 2012). In e-service-learning, students have regular contact with their instructor, peers, and community partner. Students have the opportunity to apply what they are learning outside of the virtual classroom.

The fact that students in the e-service-learning condition reported that the assignments were more relevant to the course, more useful in learning course material, and more enjoyable than the students in the service-learning condition was a surprising finding. It was anticipated that students in face-to-face and distance learning sections would not differ in these areas. Since a number of measures were in place to eliminate extraneous variables, the group differences are interpreted with caution as true group differences that resulted from the experimental condition.

Students indicated in their reflection papers that interacting with individuals with developmental disabilities virtually reduced their levels of anxiety. Beiter et al. (2015) observed that 33% of students displayed mild or greater levels of depression, 40% of students displayed mild or greater levels of anxiety, and 38% of students displayed mild or greater levels of stress. Previous research indicates that the distance learning setting may be associated with the absence of anxiety in some learners (Hurd, 2007). Students taking courses online do not have to worry about being unexpectedly called upon to answer a question.

Further, students are not afraid of appearing "dumb" in front of their peers. The anonymity of distance education may actually reduce anxiety.

E-service-learning is a relatively new pedagogical technique. The results of the current study support the efficacy of e-service-learning. Furthermore, this study indicates that e-service-learning produces similar learning outcomes as service-learning. Although overall enrollment continues to decline in U.S. higher education institutions, online course enrollment has steadily increased (Seaman et al., 2018). Similar to service-learning, e-service learning fosters academic achievement, personal growth, and civic engagement in the online environment while enhancing student engagement. E-service-learning is the future of service-learning.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Farmingdale State College Institutional Review Board. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

MF designed the research study, conducted the study, analyzed the data, and wrote the manuscript.

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Conflict of Interest: The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.