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Emily Faulconer

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eService-Learning: A Decade of Research in Undergraduate Online Service-learning

Emily Faulconer

Embry-Riddle Aeronautical University

ABSTRACT

With an increasing number of courses taught asynchronously online, it is important to explore how to implement high-impact practices in this modality. Service-learning – a high impact practice – is a course-based, credit-bearing type of experiential learning. It is important to understand instructional strategies and course design for service-learning in the online modality. This review provides an analysis of the last decade of research of Type II and Type IV eService-Learning (with service component online). Analysis of the literature reveals the absence of STEM disciplines, cursory attention to detailing reflection and assessment in describing learning environments in eService-Learning research, and heavy reliance on self-reported, subjective measures. This study presents a framework for performing service-learning fully online, regardless of discipline. Finally, this paper presents a clear call to research – one that aims at resolving unknowns within eService-Learning.

Introduction

Service-learning

Service-learning is a course-based, credit-bearing type of experiential learning where learning occurs through service and reflection (Kuh, 2008). Students achieve real-world objectives within a specific community, demonstrate mastery of course learning objectives, and polish key transferable skills. Service-learning is distinct from community service and internships (Table 1). The key elements of service-learning are integrated learning, high-quality service, collaboration, student voice, civic responsibility, reflection, and evaluation (*EService-learning*, 2015).

Student benefits of service-learning are broad, including practical experience (Meyer et al., 2016) and improved institutional satisfaction (Celio, Durlak, & Dymnicki, 2011; Rutti, LaBonte, Helms, Hervani, & Sarkarat, 2016), civic attitudes (Weiler et al., 2013), community service self-efficacy (Weiler et al., 2013), self-esteem (Celio et al., 2011; Weiler et al., 2013), problem-solving skills (Weiler et al., 2013), understanding of social issues (Celio et al., 2011; Yorio & Ye, 2012), academic performance (Celio et al., 2011; Yorio & Ye, 2012), and retention (Celio et al., 2011). These are moderated by variables such as the type of reflection and the mandatory nature of the service-learning experience (Yorio & Ye, 2012).

Table 1. Comparison of pedagogies of community engagement.

Characteristics	Service-Learning	Community Service	Internship
<i>Primary Beneficiary</i>	Student Community Partner	Community Partner	Student Community Partner
<i>Focus</i>	Student learning Meaningful service	Meaningful service	Student skills development
<i>Curricular Integration</i>	Full	Supplemental or none	Co-curricular or supplemental
<i>Reflection</i>	Always present – structured	Generally none	Sometimes present – varying structure
<i>Assessment</i>	Always	None	Sometimes
<i>Educational Purpose</i>	Academic learning Intellectual growth Civic engagement	Moral growth Personal growth Social growth	Professional development Networking

Note: adapted from (Service Learning vs. Internships, 2020)

Online service-learning

With the increase in online course offerings, there has been an increase in research literature focused on online service-learning (eService-Learning), where all of some of the service-learning course occurs online. Type I eService-Learning has online course instruction with onsite service. Type II eService-Learning has onsite course instruction with online service. Type III eService-Learning is blended or hybrid, with a mixture of onsite and online service and course instruction. Type IV eService-Learning – also referred to as extreme service learning – has online service and learning (Stefaniak, 2020; Waldner, McGorry, & Widener, 2010). eService-Learning may help overcome a perceived lack of interaction in online learning (Waldner, McGorry, & Widener, 2012).

Benefits of eService-Learning include cost, accessibility, time, diversity in partners and venues (due to removal of geographical constraints), security and privacy, and development of digital citizenship (Said et al., 2014; Salam et al., 2019a). Some argue that eService-learning may outperform traditional service-learning courses due to the infusion of 21st century skills into the format (EService-learning, 2015). However, there are several significant hurdles in eService-Learning design and implementation, including development of digital skills (Said et al., 2014) and limited resources for virtual community-engaged pedagogies (Purcell, 2017). A 2012 review of eService-Learning revealed just 18 published papers on the topic, most of which addressed hybrid courses (L. S. Waldner et al., 2012). A 2020 review of eService-Learning pedagogy presented a novel systems approach (Stefaniak, 2020). Recently published books have explored eservice-learning as well (High-impact practices in online education: Research and best practices, 2018; Strait & Nordyke, 2015).

As more courses are transitioning online, it is important to understand how benefits and challenges of eService-learning with fully online service components relate to online and distance learning across multiple disciplines. The goal of this paper is to contribute a detailed picture of undergraduate eService-Learning with online service (Type II and Type IV). This review explores curriculum design, context and examples in various disciplines, and emerging best practices. The research questions are:

- (1) To what extent is Type II and Type IV eService-Learning adopted in various disciplines within higher education?
- (2) What conceptual frameworks are used in Type II and Type IV eService-Learning?
- (3) What Type II and Type IV eService-Learning characteristics are predominant in curriculum design?

- (4) How are Type II and Type IV eService-Learning opportunities assessed?
- (5) What are the student benefits of Type II and Type IV eService-Learning?
- (6) What are the problems and issues faced with Type II and Type IV eService-Learning?

Materials and methods

Search strategy

Relevant research literature for this systematic review was identified using the following strategies: database search, targeted journal search, internet search, and reference mining from identified articles. The databases used were Web of Science, Wiley Online Library, Scopus, ERIC, and Sage. Articles were also identified through Google Scholar. The search process used service-learning related search terms with Boolean operators (e.g. “e-service learning”; “service-learning” AND “online”). Each database, targeted journal, and internet search used the same key words and operators.

Selection criteria

Application of systematic selection criteria identified a representative sample of Type II and Type IV eService-Learning literature. Studies were included from a variety of eService-Learning focuses, including curriculum design and integration, learner outcomes, and modality comparison. The following criteria were applied for selection of research papers into this study:

- Peer-reviewed articles (Verified: Cabell’s database¹ describes the type of peer review in the journal summary under “Journalytics” and/or Ulrich’s² database which identifies if the paper is refereed)
- Reliable journals (absent from Cabell’s Predatory Reports, where over 60 journal behavioral indicators are analyzed to describe predatory, deceptive, and unethical operations)
- Undergraduate level
- Asynchronous online service (Type II or Type IV eService-Learning according to Waldner et al’s (2012) typology)
- Published between January 2010 and April 2020

The selection process began with screening titles of retrieved articles by the researcher for inclusion criteria, followed by abstract review of initially selected articles for the same inclusion criteria, concluding with a full-text review in order to make a final inclusion determination (Moher, Liberati, Tetzlaff, & Altman, 2009). Initial review of inclusion criteria, performed through title and abstract screening as well as database analysis retained 29 papers. At this step, three articles were excluded because the peer-review status of the journal could not be confirmed external from the journal.

After full-text review, 14 articles were selected for inclusion in this study, published in 14 journals. Journal categories, varied, with authors electing to publish in four disciplinary

¹See <https://www2.cabells.com/about>

²See <https://www.ulrichsweb.com/ulrichsweb/faqs.asp>

journals, three online learning journals, three disciplinary-based educational research journals, two experiential learning journals, and two education journals. No articles were discarded due to a lack of full-text availability. One paper was discarded because, despite the use of the term “service learning” as a keyword, the study was community service, with no curriculum integration or reflection (ChanLin, Lin, & Lu, 2016). Several papers were discarded due to eService-Learning categorization, including (Guthrie & McCracken, 2010a; Guthrie & McCracken, 2010b; Michael et al., 2019; Mironesco, 2014). One paper was discarded due to its focus on reflection in all types of eService-Learning, with no distinction in the data for the four types of eService-Learning (Guthrie & McCracken, 2014). Not all papers initially identified for this review described Type II or Type IV eService-Learning experiences. Instead, some papers presented information such as faculty and instructional designer perspectives for eService-Learning in general, including (Dailey-Hebert, Donnelly, & Kenworthy, 2019; Guthrie & McCracken, 2014; Helms, Rutti, Hervani, LaBonte, & Sarkarat, 2015; Maddrell, 2014; Nielsen, 2016; Salam et al., 2019b) and were thus excluded from the analysis but were incorporated into the discussion. Papers were categorized by research approach (Table 2); some papers included mixed methods, resulting in a total frequency higher than the included papers in this study.

In this study, three papers were identified as Type II (Gasper-Hulvat, 2018; Marcus, Atan, Talib, Latif, & Yusof, 2019; Sun & Yang, 2015), nine papers identified as Type IV (Bharath, 2020; Bourelle, 2014; Early & Lasker, 2018; Harris, 2017; McGorry, 2012; Purcell, 2017; Sandy & Franco, 2014; Schwehm, Lasker-Scott, & Elufiede, 2017; Soria & Weiner, 2013), and two papers were unable to be categorized as there was not enough detail in the work to distinguish Type II from Type IV (Garcia-Gutierrez, Ruiz-Corbella, & Del Pozo Armentia, 2017; Rusu, Copaci, & Soos, 2015). It is important to note that the categorization of all four types of eService-Learning at both graduate and undergraduate level in a previously-published review (Stefaniak, 2020) incorrectly categorized several works. Some projects categorized as Type IV allowed for student selection of service activity, which could include on-site service at their discretion (Early & Lasker, 2018) or had an optional on-site component in addition to online service (Bharath, 2020; Sandy & Franco, 2014).

Table 2. Research approaches in reviewed articles.

Research Approach	Frequency	Source
Qualitative – Reflection Response Coding	5	(Bharath, 2020; Bourelle, 2014; Marcus et al., 2019; Soria & Weiner, 2013; Sun & Yang, 2015)
Quantitative – Surveys (existing instruments)	4	(Early & Lasker, 2018; McGorry, 2012; Rusu et al., 2015; Schwehm et al., 2017)
Qualitative – Interviews	3	(Gasper-Hulvat, 2018; Harris, 2017; Sun & Yang, 2015)
Qualitative – Survey (open)	3	(Early & Lasker, 2018; Sandy & Franco, 2014; Schwehm et al., 2017)
Quantitative – Surveys (novel instrument)	3	(Marcus et al., 2019; Soria & Weiner, 2013; Sun & Yang, 2015)
Descriptive or Exploratory Case Study	1	(Garcia-Gutierrez et al., 2017)
Essay	1	(Purcell, 2017)

some papers used multiple approaches, resulting in a frequency >14.

Themes and focus questions

Quantitative and qualitative content analysis was performed to categorize themes and concepts within the texts in order to analyze results. Once the articles for this review were established, the papers were categorized by theme (Table 3). The predominant focus was on course design and implementation strategies, though many papers also reported learner outcomes. Modality comparison was noted in three courses. While many papers did not have clearly stated research questions, some examples of those explored in the literature were:

- “Do adult students participating in on-site and online service projects report similar learning outcome measures?” (Schwehm et al., 2017)
- “Do adult students participating in on-site and online service projects share similar service-learning experiences?” (Schwehm et al., 2017)
- “What are the learning processes and strategies in the service-learning project?” (Sun & Yang, 2015)
- “What are students’ overall attitudes toward the Web 2.0 service-learning experiences?” (Sun & Yang, 2015)
- “Do ‘nontraditional’ students taking a fully online course find SL of value to their educational experience or an added stressor?” (Early & Lasker, 2018)
- “What are the benefits and challenges of including SL in fully online health curricula?” (Early & Lasker, 2018)

Some aims stated in the literature were:

- “... to give backing to and argue in favour of the possibility of an authentic humanist education in virtual and distance settings ...”. (Garcia-Gutierrez et al., 2017)
- “... to examine how service learning, which provides an authentic learning task, on Web 2.0 may help the EFL student develop public-speaking skills.” (Sun & Yang, 2015)
- “... to highlight results and lessons learned from an undergraduate course design project that explored the impact of SL on community of inquiry measures ...” (Early & Lasker, 2018)

Results

Disciplines utilizing eservice-learning

English, communications, and education appear to be early adopters of Type II and Type IV eService-Learning (Table 4). This aligns with the predominant disciplines reported in

Table 3. Frequency of papers by theme.

Theme	Frequency	References
Course Design & Implementation	7	(Bharath, 2020; Bourelle, 2014; Early & Lasker, 2018; Garcia-Gutierrez et al., 2017; Harris, 2017; Purcell, 2017; Sandy & Franco, 2014)
Learner Outcomes	9	(Bourelle, 2014; Early & Lasker, 2018; Gasper-Hulvat, 2018; Marcus et al., 2019; McGorry, 2012; Rusu et al., 2015; Schwehm et al., 2017; Soria & Weiner, 2013; Sun & Yang, 2015)
Modality Comparison	3	(McGorry, 2012; Schwehm et al., 2017; Soria & Weiner, 2013)

Note: some papers covered multiple themes, resulting in a frequency >14.

Table 4. Disciplines and example projects for type II and type IV eService-learning.

Discipline	Frequency	References	Project Description
English & Communications	4	(Bourelle, 2014; Harris, 2017; Soria & Weiner, 2013; Sun & Yang, 2015)	Information campaign plans for NGO (Harris, 2017) Fundraiser proposal (Bourelle, 2014) Video development (42)
Education	3	(Garcia-Gutierrez et al., 2017; Rusu et al., 2015; Sandy & Franco, 2014)	Tutoring (Rusu et al., 2015) Interviewing for language proficiency (Garcia-Gutierrez et al., 2017) Create "virtual community walk" using online mapping (Sandy & Franco, 2014)
Management & Leadership	2	(Bharath, 2020; Purcell, 2017)	Create human resource materials for local nonprofits (Bharath, 2020)
Marketing	2	(McGorry, 2012)	
Computer Science, Information & Communication Technology	1	(Marcus et al., 2019)	
History/Art History	1	(Gasper-Hulvat, 2018)	Transcript editing of oral histories for web publication (Gasper-Hulvat, 2018)
Public Health	1	(Early & Lasker, 2018)	Organizing a supply drive for local nonprofit; canvassing and educational events; facilitating small group dialogs; blog article preparation; organizing a film screening; creating an online public digital art exhibit (Early & Lasker, 2018)
<i>Not reported</i>	1	(Schwehm et al., 2017)	

a review of all types of eService-Learning, including graduate courses (Stefaniak, 2020). In comparison, predominant disciplines for traditional service-learning include health sciences, business and economics, computer and information sciences (Salam et al., 2019a).

Conceptual frameworks

The most common frameworks applied to Type II and Type IV eService-Learning are Kolb's experiential learning cycle (Schwehm et al., 2017), situated learning theory (Sun & Yang, 2015), and community of inquiry (Early & Lasker, 2018). However, some studies did not clearly identify a framework (Garcia-Gutierrez et al., 2017; Harris, 2017; Rusu et al., 2015). Table 5 shows how these conceptual frameworks overlap in the phases of service-learning.

eService-learning benefits

There are consistent key pedagogical values that offer benefits to students engaged in Type II and Type IV eService-Learning (Table 6). Benefits are wide-ranging, including transferable skills refinement (e.g. empathy and critical thinking), professional opportunities (e.g. networking and acquiring real-life experiences), academic growth (e.g. improved content knowledge mastery), and personal growth (e.g. self-efficacy).

Trajectory of eService-learning

When reviewing the implementation of eService-Learning by various disciplines, an interesting trend emerged. There appears to be an increased interest in eService-Learning with an online service component (Type II and Type IV). More than two thirds of the articles

Table 5. Conceptual framework approaches to eService-Learning.

eService-Learning Phases		Service		Post-Service
Pre-Service		Implementation	Reflection	Assessment & Evaluation
Planning & Preparation				
Kolb's Experiential Learning Cycle				
Active Experimentation		Concrete Experience	Reflective Observation	Abstract Conceptualization
Situated Learning Theory				
Modeling of processes		Collaboration	Reflection	Assessment & Learning
Multiple Roles and Perspectives		Practice	Articulation	
Authentic Context		Authentic Activities		
Community of Inquiry				
<i>Social Presence</i>		Open Communication	Affective Expression	
<i>Cognitive Presence</i>		Group Cohesion		
<i>Teaching Presence</i>		Exploration	Integration	Resolution
Triggering Event		Facilitating Discourse	Facilitating Discourse	Summative Feedback
Exploration		Direct Instruction	Direct Instruction	
Design & Organization		Formative Feedback	Formative Feedback	

Table 6. Data-supported positive student outcomes from type II and IV eService-learning.

Pedagogical Value	Reference	Outcome
Global	connectedness	(Early & Lasker, 2018; Garcia-Gutierrez et al., 2017; Harris, 2017; Rusu et al., 2015; Schwehm et al., 2017)
	Enhanced global citizenship (e.g. cross-cultural exposure, bias recognition, and empathy) (Bharath, 2020; Soria & Weiner, 2013) (Bourelle, 2014; Early & Lasker, 2018; Marcus et al., 2019; Schwehm et al., 2017)	Networking Civic responsibility and social consciousness Fostered empathy Acquiring real-life experience
(Gasper-Application of knowledge	Hulvat, 2018; Marcus et al., 2019) (Bharath, 2020; Bourelle, 2014; McGorry, 2012; Soria & Weiner, 2013) (Bharath, 2020) (McGorry, 2012; Schwehm et al., 2017) (Schwehm et al., 2017) (Early & Lasker, 2018; Gasper-Hulvat, 2018; Marcus et al., 2019; Schwehm et al., 2017; Soria & Weiner, 2013) (Gasper-Hulvat, 2018)	Resume-building Gaining workplace skills Critical thinking development Content knowledge mastery
Peer Learning	(Bourelle, 2014; Garcia-Gutierrez et al., 2017; Gasper-Hulvat, 2018; Marcus et al., 2019; McGorry, 2012; Schwehm et al., 2017; Soria & Weiner, 2013; Sun & Yang, 2015) (Gasper-Hulvat, 2018; Sun & Yang, 2015) (Early & Lasker, 2018; Gasper-Hulvat, 2018; Schwehm et al., 2017) (Marcus et al., 2019)	Improved decision-making Improved interpersonal, communication, and teamwork skills Enhanced listening skills Growth in confidence and self-efficacy Developed adaptability

included in this review of the last decade of research were published in the last five years. Over 30% of the articles included in this review were published since the start of 2018.

From the studies used in this review, there is a notable absence of STEM courses in existing eService-Learning. This absence of STEM disciplines is mirrored in other reviews of both

traditional and online service-learning (Salam et al., 2019a; Stefaniak, 2020). STEM faculty have demonstrated reluctance to transition to online modalities (Horvitz et al., 2015; Steinke, 2012).

Conceptual framework

There is not a consistent conceptual framework applied to eService-Learning, though the conceptual framework used to guide instructional design practices in eService-learning typically aligns with traditional service-learning. Traditional service-learning has commonly been grounded in experiential learning theory (Hoxmeier & Lenk, 14; Kolb, Boyatzis, & Mainemelis, 2001; Mann & Schroeder, 2019; Salam et al., 2019a; Scanlan, 2015), but also has been framed through social-cognitive theory (Meaney, Housman, Cavazos, & Wilcox, 2012), constructivism theory (Galvan & Parker, 2011), Parse's theory of human becoming and Parse's teaching and learning model (Condon, Grimsley, Knaack, Pitz, & Stehr, 2015), and the student development theory (Scanlan, 2015). There may never be a one-size-fits-all model due to disciplinary differences. Design-based research is needed to test, refine, and extend the theoretical foundations of eService-Learning pedagogical design (Stefaniak, 2020).

Curriculum design considerations

Whether creating a new online service-learning course, adding a service-learning component to an existing online course, or transitioning a traditional service-learning course to the online modality, it takes planning and appropriate lead time (at least 4–5 months) (Early & Lasker, 2018). Faculty who are interested in designing and teaching online service-learning may consider connecting with other service-learning faculty to exchange experiences, ideas, and resources (Becket, Refaei, & Skutar, 2012; Early & Lasker, 2018). As with traditional service, learning (Scanlan, 2015), a preliminary task includes a plan to manage legal and ethical issues in eService-Learning, which may be constrained by institutional support and culture as well as administrative processes involving external partnerships. Another preliminary task is human, physical, and digital resource identification. Resources include personnel, instructional technologies, communication technologies, equipment, time, and budgetary support.

Service design

A key decision when designing the service component of eService-Learning is who is responsible for partner identification and selection. The literature is mixed, with some papers indicating (either explicitly or implied) instructor selection (Bourelle, 2014; Harris, 2017; Rusu et al., 2015) or an instructor-provided short list of partners (Bharath, 2020; Early & Lasker, 2018). Two studies that address all types of eService-Learning (not limited to Type II or IV) advocate for student selection (Helms et al., 2015; Nielsen, 2016). The benefits of student partner selection include the option for in-person service if the student desires such, an expanded network by using students' networks, and support for pursuit of students' personal interests. However, instructors must still do a significant amount of work to establish scaffolding for partner identification and relationship development (Nielsen, 2016). When instructors select the partner(s), they can ensure that proper institutional

measures are followed regarding external collaborations. Additionally, if the instructor selects one partner for the entire class to work with, this will limit the number of relationships the instructor must manage. Regardless of who is selecting the partner, considerations in identifying a partner include their ability to commit time and resources (Harris, 2017), their willingness to communicate virtually (Schwehm et al., 2017), and careful alignment of service with course goals (Bourelle, 2014). Communication between the partner and student(s) should start early in the term, including student presentation of the project proposal for approval by the community partner (Helms et al., 2015). It is ideal to establish a mechanism for regular communication between students and partners (Early & Lasker, 2018).

Another key decision for service design is how multiple class projects will be managed. If all students in a class are working with the same community partner, the students (or student teams) can work collaboratively (Harris, 2017) on separate aspects of a project or competitively, with the community partner selecting the deliverable that will be used. Students can also work individually with their own community partner. However, institutions have varying procedures for partnerships and establishing multiple partnerships may require significant administrative time. Furthermore, it is an additional burden on instructors to supervise multiple partnerships with diverse goals, needs, and project deliverables.

Instructors must also decide whether students work alone or in pairs. Group work may improve accountability (Bharath, 2020) and combat feelings of disconnection or isolation, though student choice is also an option (Early & Lasker, 2018). Instructors should also consider how student attrition may impact projects. Online courses tend to have higher drop and withdrawal rates than traditional courses (Atchley et al., 2013; Jaggars et al., 2013; Murphy & Stewart, 2017). While more research is needed, preliminary data shows that withdrawal rate in service-learning versus non-service-learning courses is equivalent (Leimer, Yue, & Rogulkin, 2009). It is unclear at this time if this holds true for eService-Learning, though one study reported an expected withdrawal rate (Soria & Weiner, 2013).

Another design consideration is whether there is a bail-out option (using hypothetical case studies) for students where they can complete the project even if the service fails (due to factors outside of their control like poor engagement from a chosen partner) (Early & Lasker, 2018). Instructors must also plan ahead for how they will handle deliverables that fall below expectations, as this does happen in a certain percentage of projects (Bharath, 2020).

Course design

The reviewed literature on Type II and IV eService-Learning reveals several key course format and considerations. Some practitioners advocate for the use of a pilot section of an eService-Learning course prior to full scale launch (Early & Lasker, 2018; Harris, 2017). In addition to the service design decisions discussed previously, instructors must also make course design decisions. Instructors must consider the project scope and outcomes based on the course semester length. The majority of eService-Learning projects are taught with term lengths greater than 12 weeks (Stefaniak, 2020). A key consideration in design of any service-learning course is both instructor and student workload (Salam et al., 2019a; Stefaniak, 2020; L. S. Waldner et al., 2012). In one course, the service component comprised 24% of the total course contact hours (Gasper-Hulvat, 2018).

Specific course elements of Type II and Type IV eService-Learning are also discussed in the literature. A course orientation is described as a best practice to describe expectations and due dates as well as cultural relativism, methods of working effectively with remote partners, and ethical issues (Bourelle, 2014; Early & Lasker, 2018; Harris, 2017). A common deliverable in service-learning courses is an Action Plans and Partner Profiles. An Action Plan is a course activity option where tasks, responsibilities, deadlines, and learner-identified learning goals and associated activities and deliverables are described (Bharath, 2020). A Partner Profile is a description of the partner and their mission and an assessment of their needs being addressed through the service (Werpetinski, 2017). This course element also outlines the entities mission, values, goals, history, programs, and organizational structure. Asynchronous discussions – common in online courses – have been used for whole-class trouble-shooting and reflection which allows all students to see what their peers are doing, problems that are encountered, and solutions that have been found (Bourelle, 2014; Rusu et al., 2015). Another course activity used in eService-Learning is instructor-facing (graded) progress reports that provide an update on activities and deliverables as well as a discussion of problems encountered or a reflection on course connections, personal development, and skills development (Bharath, 2020). Alternatively, partner-facing progress reports are a mechanism to gain feedback and evaluation from the community partner on the activities and deliverables (Bharath, 2020). A final report has been implemented in many eService-Learning courses as a final description of activities and deliverables and a reflection (Bharath, 2020; Bourelle, 2014; Harris, 2017; Soria & Weiner, 2013). Peer evaluation has also been implemented to provide feedback on deliverables by peers (Bourelle, 2014).

Reflection

Another instructor decision addresses reflection design. Reflection can be individual or collaborative. From the literature reviewed on Type II and Type IV eService-Learning, individual/team reflection (Bourelle, 2014; Gasper-Hulvat, 2018; Soria & Weiner, 2013; Sun & Yang, 2015) predominated over whole-class collaborative reflection (Rusu et al., 2015). Modes of reflection reported in the literature include journaling (Soria & Weiner, 2013), report writing (Bourelle, 2014; Sun & Yang, 2015), multimedia presentations and objects (Gasper-Hulvat, 2018), group discussion (Rusu et al., 2015), and questionnaire or self-assessment form (Harris, 2017; Marcus et al., 2019). For example, Gasper-Hulvat (2018) asked students to make connections between service, course content, and transferable skills through written explanations or visual graphics. Bourelle (2014) cautions against too strong of an emphasis on content knowledge and skill-building in reflection.

Instructors must also decide if reflection will occur during the service activities or as a culminating activity. From the literature reviewed, culminating reflection was prevalent (Bourelle, 2014; Gasper-Hulvat, 2018; Harris, 2017; Marcus et al., 2019; Soria & Weiner, 2013; Sun & Yang, 2015), though some course formats supported multiple reflection points (Bharath, 2020). Students should reflect on disciplinary, civic/cultural, personal, and technological learning outcomes. Practitioners of eService-Learning promote the use of a guided reflection process (Guthrie & Mccracken, 2014). Several studies did not mention reflection

as part of the eService-Learning (Garcia-Gutierrez et al., 2017; McGorry, 2012; Schwehm et al., 2017).

Assessment

Another course design decision centers on assessment. Will students be evaluated by exams, reflections, deliverables, or some other mechanism? Will summative assessment focus on content learning, personal growth, skills, or a combination of these? Some instructors may opt to add autonomy to the process, including students in identifying assessment measures to indicate learning occurred.

Much of the literature reviewed on Type II and Type IV eService-Learning did not describe how students were assessed on their eService-Learning activities or deliverables (Bourelle, 2014; Early & Lasker, 2018; Garcia-Gutierrez et al., 2017; Gasper-Hulvat, 2018; McGorry, 2012; Rusu et al., 2015; Sandy & Franco, 2014; Schwehm et al., 2017; Soria & Weiner, 2013; Sun & Yang, 2015). Mention of assessment was very cursory, with one study reporting the use of rubrics for instructor evaluation of transferable skills (Marcus et al., 2019) and another study reporting a formal evaluation provided by the community partners (Harris, 2017). Because assessment of student connections between service and learning has been challenging in traditional service-learning (Salam et al., 2019a), it is expected to be similarly problematic in eService-Learning.

These practices largely mirror best practices presented for eService-Learning as a whole (Stefaniak, 2020). Additionally, Stefaniak (2020) suggested using recorded videos to guide project progression, providing optional synchronous collaboration opportunities, communicating and managing clear expectations, preparing a service-learning contract, using project management tools (e.g. Gantt chart), applying flexible deadlines, and clearly communicating skills that will be developed and resources that are available.

Curriculum integration

The integration of technology into eService-Learning is a key consideration in curriculum integration (Bourelle, 2014; Salam et al., 2019b; Stefaniak, 2020). eService-learning should not just be a tech add-on to a course (Dailey-Hebert et al., 20199). Technology support is needed for each phase of eService-Learning. While instructor-selection of a communication platform may help ensure technology support is available during the term, instructors may decide to allow flexibility for use of communication platforms that work for all stakeholders (Harris, 2017). Regardless of the platform chosen it is ideal to provide technology training for all stakeholders.

From the literature reviewed on Type II and Type IV eService-Learning, various types of communication platforms were used. Video communication (e.g. Skype) between stakeholders (students, instructors, and community partners) was a common synchronous approach (Bourelle, 2014; Garcia-Gutierrez et al., 2017; Gasper-Hulvat, 2018; Harris, 2017; McGorry, 2012). Synchronous chat platforms were used as well, including Facebook messenger (Sun & Yang, 2015), Google Chat (Bharath, 2020), and LMS chat features (Bourelle, 2014). Asynchronous communication used in the studies included e-mail (Bourelle, 2014; Gasper-Hulvat, 2018; Harris, 2017; McGorry, 2012; Soria & Weiner, 2013), LMS discussion forums (Bourelle, 2014; Early & Lasker, 2018; Marcus

et al., 2019; McGorry, 2012), blogs (Bourelle, 2014), and Facebook (Harris, 2017; Sun & Yang, 2015). Various other technology platforms were used for project-specific tasks, including digital archives (Gasper-Hulvat, 2018), Google Earth (Sandy & Franco, 2014), and YouTube (Sun & Yang, 2015). While many eService-Learning courses used the LMS for file sharing, some reported the use of external platforms such as Dropbox (Harris, 2017).

Course facilitation

Facilitation best practices are reported in the literature for Type II and IV eService-Learning. Early virtual contact with community partners (with instructor facilitation) is suggested (Bharath, 2020). This meeting can ensure that technology platforms are working, provides early familiarity to all stakeholders in the platform early in the project, and allows for early clarification of roles and responsibilities. This can also allow students the opportunity to develop an action plan and partner profile, if this course activity is being used.

Though outside of the scope of the literature reviewed, a best practice for service-learning is to contact students as early in the term as possible to notify them of the service component (Nielsen, 2016). This is particularly important if service-learning is not highly institutionalized, meaning few students will be familiar with the format and expectations. Early notification will improve transparency and may mitigate attrition.

eService-Learning requires a significant time investment from students and partners (and instructors). Consider multiple forms of extrinsic and intrinsic motivation, including asking community partners to place a monetary value on the services provided through the project (Bharath, 2020). Consider facilitating formal appreciation between students and partners for their contributions (both partners thanking students and vice versa) (Bharath, 2020).

Themes and gaps in the literature

eService-learning benefits

As supported in eService-Learning as a whole (Dailey-Hebert et al., 20199; L. S. Waldner et al., 2012), Type II and Type IV eService-Learning offers non-linear learning opportunities through a student-centered approach (Bourelle, 2014). Student benefits vary in the literature and are likely a factor of course design and service activities, among other factors.

When comparing eService-Learning as a whole to traditional service-learning, the equivalence between achievement of learner outcomes by modality was uncertain in the literature. Some research reported equivalence (such as, McGorry, 2012) and other research reported stronger learning outcome attainment in civic responsibility for traditional service-learning students (Schwehm et al., 2017). No studies explored equivalence between traditional service-learning and Type II or Type IV eService-Learning. Furthermore, no studies explore equivalence between Type II/IV eService-Learning (with service online) to Type I eService-Learning (with service on-site). Regardless of modality equivalence, Type II and Type IV eService-Learning has demonstrated efficacy in achieving course learning outcomes (McGorry, 2012; Schwehm et al., 2017; Soria & Weiner, 2013) and improving Community of Inquiry (Early & Lasker, 2018).

The literature on Type II and Type IV eService-Learning reviewed here was primarily anecdotal or relied on subjective self-reporting. This limitation has been previously noted (Waldner et al., 2012), suggesting not much has changed in the last eight years in research on this type of service-learning. Research on the topic relied on quantitative surveys, qualitative surveys, interviews, and reflection artifact analysis. Research could be improved by including both subjective and objective measures of learning (e.g. student performance on content knowledge assessment). Furthermore, evidence of benefits to the institution or community partners was largely lacking in the existing literature.

eService-learning challenges

There are some concerns noted by service-learning practitioners where Type II and Type IV eService-Learning may be less capable of achieving an outcome possible through traditional service-learning. For example, an immersion model is not possible through a fully virtual service project (Harris, 2017). By using a single partner for a geographically dispersed student cohort, it may be challenging for students to feel a *cultural nearness* to their partner, which has been reported as a student desire (Harris, 2017). Students completing service online report similar challenges as with traditional service-learning, including time, lack of interest, partner issues, and team work problems (Bharath, 2020). Some challenges are valuable, though, with students reporting the time investment was notable but worth it and that group work issues were present but allowed for personal development of teamwork and leadership skills (Bharath, 2020). As expected, students reported virtual communication as a barrier in an eService-Learning course (Bharath, 2020; Bourelle, 2014).

Another challenge for eService-Learning is sustainability. This includes institutional infrastructure and support and the maintenance of access to community experts. The *Comprehensive Action Plan for Service Learning* is a model often used for assessing the status of service-learning institutionalization (Salam et al., 2019a). This model addresses planning, awareness, resource identification, piloting, progress monitoring, scaling, recognition, evaluation, and research. However, no literature currently applies this model to eService-Learning. Other models that have been applied to traditional service-learning that can address sustainability include the *Context, Input, Product, Process Evaluation* model (Zhang et al., 2011). This decision-oriented model identifies strengths and weaknesses in either course content or delivery for continuous improvements in context, input, process, and product.

Technology and communication are likely to be a challenge in service-learning with an online service component (Sun & Yang, 2015). This can result in anxiety (Sun & Yang, 2015). Careful implementation of communication platforms, training, and transparent troubleshooting may mitigate impacts.

Call to research

The literature reviewed for this paper provided many suggestions for future research that, at this time, do not appear to be addressed. For example, Harris (2017) suggested exploration of the impact of virtual learning spaces on service-learning experiences, the interpersonal and intercultural communication strengths and weaknesses in forming virtual

relationships, and how eService-Learning fits in with the whole of higher education. Garcia-Gutierrez et al. (2017) suggested a detailed investigation of learning achieved.

This review revealed additional gaps in the existing eService-Learning literature. None of the studies included in this study measured or discussed short or long-term community partner impacts. Withdrawal rate between eService-Learning and traditional service-learning was only reported in one of the three comparison studies, leaving room for uncertainty regarding learner persistence. Furthermore, the modality comparison studies reported aggregate data and did not expressly explore equivalence between traditional service-learning and online service (Type II and Type IV service-learning).

A significant challenge in eService-Learning research centers on research design. Service-learning involves many variables that cannot be controlled by the researcher. Sample sizes in the literature reviewed ranged from 14 to 46 learners. Two studies did not report a sample size (Bharath, 2020; Bourelle, 2014). Studies tend to focus on a single institution and often present a single case study. Studies also tend to rely on self-assessment and perspectives, with weak validity of the measures (Soria & Weiner, 2013).

In Waldner's (2012) review, it was noted that eService-Learning literature is primarily anecdotal. At this time, this still appears largely true. Research could be improved by including both subjective and objective measures of learning (e.g. student performance on content knowledge assessment). Specifically, studies that report student learning outcomes (e.g. persistence and performance) in addition to perspectives, satisfaction, and self-reported objective achievement would be beneficial.

The literature on traditional service-learning reports various frameworks, most of which are disciplinary-focused. While service-learning certainly does have specific disciplinary pedagogical choices that influence design and facilitation, in Type II and Type IV eService-Learning, I argue that a framework generalized to all online service can be useful. Any proposed framework for Type II and Type IV eService-Learning would need to be validated through mixed methods research that includes both qualitative and quantitative data to understand the influence of the multiple variables that can influence eService-Learning outcomes. Likely variations in the framework between Type II and Type IV eService-Learning will occur for course implementation variables and learner variables. Class sizes, level of supervision (physical instructional presence versus virtual instructional presence, and access to communication technology are all very likely to vary based on whether a course is held in-person or online. Additionally, online students tend to be non-traditional students and thus will have different demographics than students taking courses in person (Woods & Frogge, 2017).

Limitations

Systematic literature reviews have inherent limitations. First, access to literature was a notable limitation as access to many research articles was limited through paywalls. The subscriptions and access of the researchers will limit the scope of potentially relevant research. A second limitation inherent in systematic reviews was the narrowly defined nature of the research questions. Alternative questions cannot typically be considered by readers. Due to the breadth of available literature and the selection criteria, the resulting *n* for this study was relatively small, which could limit the strength of findings.

Conclusion

Despite a limited body of literature on eService-learning projects that include online service, there are still important findings from the research. Research in online service in eService-Learning (Type II and IV) is growing in popularity, though STEM disciplines are conspicuously absent from the existing literature. Design of online service in a course aligns with best practices for traditional and eService-Learning. Kolb's Experiential Learning Cycle, Situated Learning Theory, and Community of Inquiry are conceptual frameworks applied to online service-learning (Type II and Type IV).

Assessment was largely overlooked in research of online service in eService-Learning. This is likely because it continues to be a challenge in service-learning as a whole. This is a research area that could benefit from strong mixed methods research using both quantitative and qualitative data. We need to better understand how to evaluate and assess eService-Learning projects.

Learner benefits of Type II and Type IV eService-learning address global connectedness, application of knowledge, and peer learning and have demonstrated efficacy in achieving course learning outcomes and improving Community of Inquiry. Primary challenges in the research of eService-Learning are sample size and reliance on subjective measures. Reliance on both direct and indirect measures as well as subjective and objective measures would offer depth.

This review article describes the current knowledge regarding eService-Learning that positions the service online and presents a preliminary framework for Type II and Type IV eService-learning. This review will support future adopters of eService-Learning so that they are not creating their courses in a vacuum of best practices. Hopefully, eService-Learning adopters will publish their experiences so gaps in the literature can be filled and so that emerging best practices can be solidified.

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