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Literature review on e-SL in higher education: looking for design principles

1. Introduction

In just a few decades, Service-Learning (SL) has gone from being a little-known pedagogical approach to becoming one of the most impactful educational strategies (Paz-Lourido & de-Benito, 2021). As Eyler and Giles (2007) state, SL emerged to integrate the potential benefits of experiential learning and community service. An example of a definition is: “a learning experience in which students actively participate in service experiences that meet a real community need; the service enhances what is taught in the classroom and is integrated into the students’ academic curriculum; and the programme provides structured time for a student to think, talk, or write about what the student did and saw during the actual service activity” (Yorio & Ye, 2012, p. 10). While SL is not new, a recent innovation is the balanced planning of SL projects in a close interaction with technologies, an acceleration due to the Covid-19 pandemic. According to Sparkman (2020) the technology came to the SL to stay; it is therefore necessary to orient pedagogical reflections towards the search on the current status of this relationship, looking for design principles for what is now known as electronic Service-Learning (e-SL).

2. Methodology

2.1. Research questions and resources

The systematic review was conducted in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). PRISMA allowed for rigorous search on the following questions:

1. What is the coverage of e-SL in higher education? (RQ1)
2. What features do the e-SL projects have? and how do the technological components interact? (RQ2)
3. What types of research are available in the literature, what are their main objectives and results? In particular, what are the frameworks adopted for e-SL? (RQ3)



4. How do virtual learning spaces enhance and/or impede students' e-SL experience? (RQ4)
5. What are the quality elements of the projects analyzed and what are the design principles for e-SL? (RQ5)

Six Electronic databases – Web of Science, Scopus, Semantic Scholar, ERIC, ProQuest and Elsevier – were used to conduct literature searches to identify articles with keywords similar and related to e-SL: “e-service-learning” OR “service e-learning” OR “online service-learning” OR “online community-based learning”. The field of higher education and the time period between 2010 and 2021 were used as search filters. Using keywords and filters five universities were involved in the search for articles, each with at least one database in charge. The records were entered into a common matrix, already avoiding duplicate entries at this stage. The second screening phase started with 188 matched articles from the different databases (see Figure 1).

2.2. Screening and Eligibility

Several inclusion and exclusion criteria were determined in relation to the setting, the subject area, the type of outcomes, the availability, the literature type and the language (see Table 1). In this stage, authors manually examined all the articles to ensure it fit the criteria determined. A full-text review was conducted for eligible studies and the excluded article were tabulated according to the reasons for exclusion. The selected studies were subjected to a qualitative synthesis.

	Criteria Inclusion	Exclusion
<i>Setting</i>	Higher education	High school, primary school, kindergarten
<i>Subject Area</i>	e-SL (integrate technology during SL)	Other forms of intervention in the community
<i>Outcomes</i>	Design principles / quality elements	Other outcomes
<i>Availability</i>	Available	Not available
<i>Literature Type</i>	Journal (peer review article)	Book chapter, conference proceeding



<i>Language</i>	English, Italian, Portuguese, Spanish	Non-English, Italian, Portuguese, Spanish
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Table 1. Inclusion and exclusion criteria.

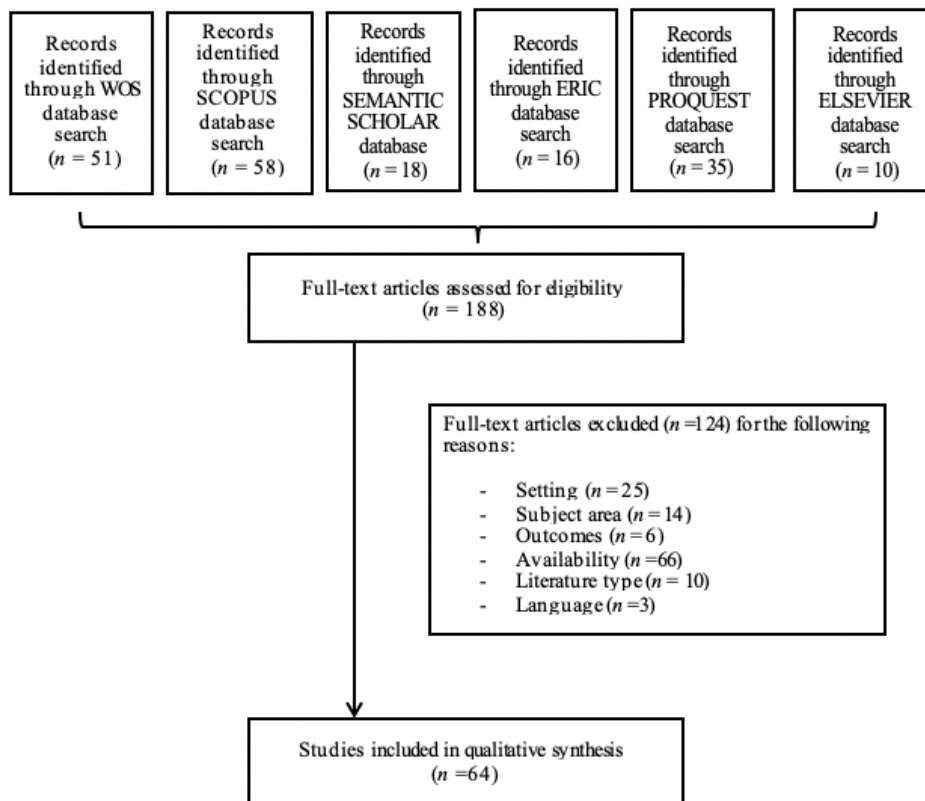


Figure 1. A flow diagram detailing the application of PRISMA.

3. Results

3.1. The coverage of e-Service-Learning in higher education (RQ1)

The analysis of articles about e-Service-Learning leads to the conclusion that the US is the most experienced nation with e-SL projects in higher education. These projects were implemented at the following universities and colleges: University of Illinois, University of Massachusetts Amherst, The Williston Northampton School, St John’s University, University of Pittsburgh, University of Central Florida, The University of Southern Mississippi, University of Georgia, Appalachian State University, Dalton State College, Chicago State College, West Virginia University, College of Education, Medical College of Georgia, St.



Catherine University, Farmingdale State College, Arkansas Tech. University, Wash College, DeSales University, Kent State University, University of Texas, Northern Kentucky University, Pennsylvania State University, University of Georgia, Florida State University, California State University, Troy University Atlanta, University of Colorado, Ft. Hays State University, University of South Florida, University of Alaska, Augusta University, Columbus State University, University of Nebraska-Lincoln.

The study of 64 articles also identified other e-SL projects that were implemented in countries (or in the areas) such as: Australia (at the Macquarie University), Canada (at the Queen's University), China (at The Hong Kong Polytechnic University), Croatia (at the University of Zagreb) Ireland, Malaysia (at the Albukhary International University, at the Universiti Teknologi Malaysia), Philippines (at the De La Salle University), South Africa (at the University of Pretoria), Spain (at the Universidad Nacional De Educación a Distancia), Taiwan (at the Chung Yuan Christian University, at the National Chiao Tung University), and Thailand (at the Faculty of Industrial Education of Technology Bangkok), (Figure 2).

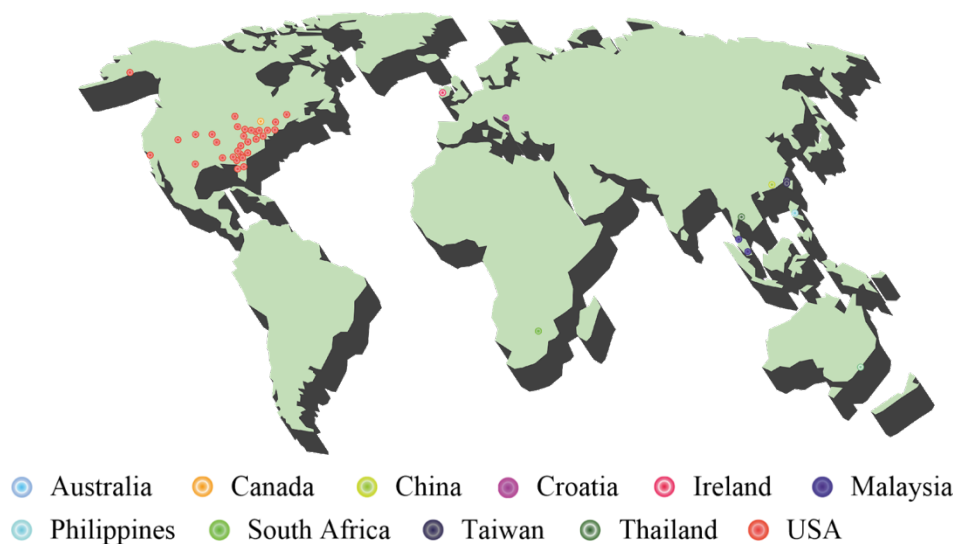


Figure 2. Universities and colleges that implemented e-SL. Analysis based on 64 articles.

3.1.1. Field and degree course of e-Service Learning projects

The analyzed e-SL projects relate to various courses of different levels (undergraduate, graduate, postgraduate, preservice teachers), within different faculties, disciplines and



interdisciplinary: Education (4), Communication (3 – including Crisis Communication), Foreign Language Education (3) (Translation and Interpretation), Leadership (2), Public relation (2), Political Science (2), Business (2), Medicine (2), Psychology, Chemistry, Engineering, Computers, Teaching Writing Courses, Creation Language and Literature, Art history, Humanities, Sociology, Social work, Personal and Volunteer, Marketing and Public administration.

3.1.2. Terms to define e-Service-Learning

The most frequently used term is e-service-learning (23 times), which was used by authors of 64 papers. The specified notation distinguishes between the appropriate name: the most often “e-service-learning”, but also “e-servicelearning” (Olberding & Downing, 2021), “E-service-learning” (Stefaniak & Jill, 2020), “eService-learnig” (Bharath & Del, 2020), “service-e-learning” (Semenski et al., 2017). Other names are: virtual service-learning (8/59) online service-learning (7/59) digital service-learning (2/59), (Figure 3). Such names are used occasionally, for instance: service-learning using technologies, interactive service-learning (Saitta et al., 2011), service learning delivered through distance learning (Hagan, Linda, 2012), remote service-learning (Gasper-Hulvat, 2018), non-face-to-face service learning (Lin et al., 2021), indirect SL activities (Leung et al., 2021), electronic Service-Learning (Vicente et al., 2021), online civic learning (Hsu et al., 2021). When authors describe a hybrid model, they use the term – blended learning.

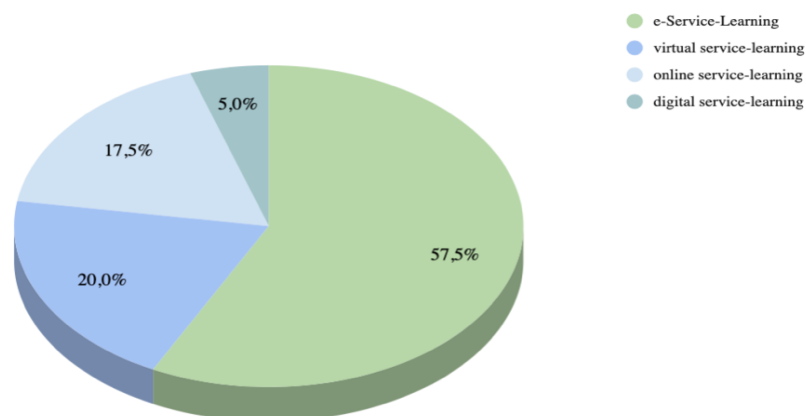


Figure 3. Frequency of using the e-SL term.



In the analyzed articles, an attempt to define e-SL was made dozen times. e-Service-Learning is often defined as a learning experience where is the instructional component and the service component, or both are conducted online (Dailey-Hebertet et al., 2008; Waldner et al., 2012; Semenski et al., 2017; Stefaniak & Jill, 2020; Marcus et al., 2021).

Other definitions describe more specific elements of the e-SL process with an emphasis on different configurations of process elements:

- E-service refers to an instructional approach where students participate in community-based placements and complete associated course work online. Such placement may also include those e-service opportunities that can be completed (Guthrie et al., 2010);
- The electronic form of experiential education and incorporates electronically online and uses the Internet and state-of-the-art-technologies that permit students, faculty and community partners focused, experiential service learning activity which simultaneously promotes civic responsibility and meets community needs (Waldner et al., 2010);
- Service-e-learning as an integrative pedagogy that engages students through technology in civic inquiry, service, reflection and action (Shah et al., 2018);
- E-service learning occurs when the instructional component and the service component in integrative pedagogy engages learners through technology in civic inquiry, service, reflection and action and are both conducted online (Marcus, 2019);
- Service e-Learning, a special kind of service learning, additionally recognized the emerging role of technology in shaping student's participation in the community and provided a quality experience while meeting the needs of multiple participants from multiple grounds, giving them the ability to make connections across the disciplines (Modic Stanke et al., 2021);
- The pedagogy is to combine digital technology with social services to further improve the quality of civic engagement and fill digital gaps in the local community (Semenski et al., 2017).

In addition, Veyvoda and Van-Cleave (2020) state that e-service refers to an instructional approach by which students participate in community-based placements online. The virtual environment offers various options for continuous dialogue through such tools as asynchronous e-mail or threaded discussion forms and synchronous real-time conferencing platforms such as



Skype or basic chat and instant messaging functions (Barab et al., 2001; Meyers, 2008). In this way the Internet becomes an educational tool that expands working in a local community to working in a global community. The authors of the article conclude that service-learning involves the complex process of acquiring individual knowledge with inviting positive collective community action (Guthrie & McCracken, 2010a).

3.2. e-SL projects and technology interaction (RQ2)

3.2.1. Features of current e-SL projects

There is a great diversity of projects examined in scientific studies. From their description, several categories are identified that describe the features of e-SL projects as well as the nature of SL itself. Project were focused on:

- the development of online materials, for example social media campaign project, written/visual pitch book and voice-over PowerPoint presentation;
- the development of knowledge, skills and competences needed in order to provide service for the community;
- the creation of business–university–community partnership with the aim to empower and prepare students for future educational or career endeavors;
- advancing the organization’s mission or purpose to address the issues and needs of the community;
- contributing to global sustainable development, development of human resource materials for examples volunteer manuals and orientations, and volunteer recruitment and evaluation plans, making tutorial videos, holding online learning workshops, creative videos, digital resources, brochures, handouts, formal thank-you letters, newsletters, and forms, creating products that are openly available on the web, digital storytelling used by pre-service teachers, creation of lecture proposals;
- creation of the online learning platform to provide coaching and scaffolding for students;
- capacity building for organization, for example a marketing plan for the organization as well as specific strategies for promotion and communication of the organization and its events, developing apps, websites, virtual labs.



The specific topic connected with e-SL projects were projects connected with Covid, which include for example COVID-19 Updates” as weekly presentations on YouTube, weekly literature reviews, myth busters, and infographics, a daily blog with local COVID-19 news, responding to comments about Covid, distributing materials for Covid (masks, gloves, etc.), seeking donations from businesses, sewing and distributing masks, producing wellness newsletter, Instagram newsletter...

Diversity of e-SL projects is also connected with different aims of the projects for example: to improve basic health and education, and promote civic participation among young people, to improve the environmental and economic performance of organizations in general, to provide disadvantaged local secondary school students with learning opportunities, to empower underprivileged and disadvantaged students by transferring social entrepreneurship qualities on them.

In the description of the projects we identify all steps of e-SL implemented, for example analysis of needs, reflective journal, etc.

3.2.1.1. Type of service

Type of the service is illustrated in Figure 4. Most SL projects analysed in the studies belong to the categories of Direct and Indirect e-SL (19 both). Direct SL involves students in service activities with direct interaction with beneficiaries. Indirect SL involves students in a community service without a direct relationship with the beneficiaries; the community is benefited by the project as a whole. In 14 studies we couldn't specify the type of the service. Only 4 projects in analysed studies belong to Advocacy e-SL, which involves students in activities aimed at raising awareness, promoting action on issues of public interest and 2 into Research-based e-SL, which involves students in research activities to collect and process information of public interest that can have an impact on reality. Five projects combine two or more types of service.

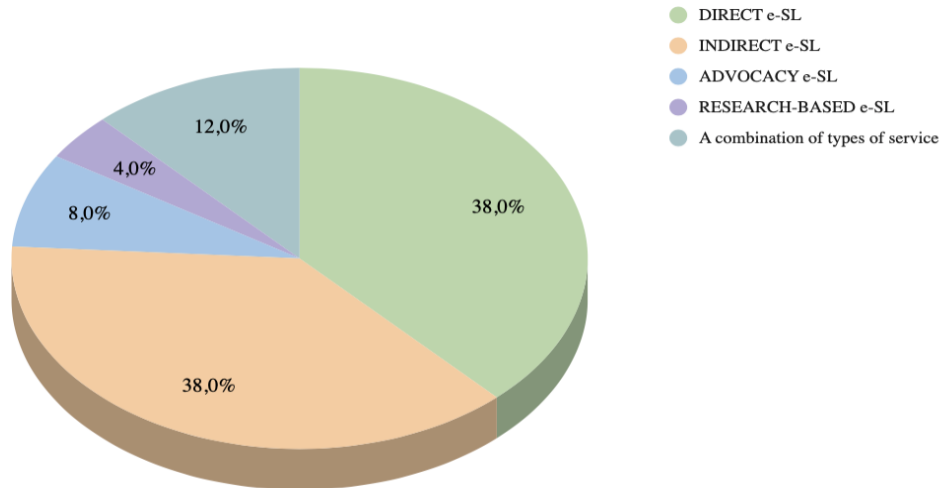


Figure 4. Types of service.

3.2.1.2. Target group addressed

Categories of target groups addressed by the projects are illustrated in Table 2.

In terms of the target group addressed by the project in debate, the most numerous categories were Education-bound target group: educators, educational institutions, K12, secondary students (13 articles) and local community: improvement of libraries, infrastructure, general public, parents with children (12 articles). Follow the category of people with special needs: disadvantaged, behavioural problems, developmental disorders, students in rural areas (11 articles). These three categories dramatically outsourced the other ones; it seems that e-SL focused mostly on education, local communities and people/students/community members with special needs (both economic and non-economic). The third largest target group category was NGOs: retirement houses, foster homes, shelters, low income groups (7 articles), which partially complies with the category people with special needs. Other categories emerged: business, minorities and culture were not subject to more than 2 articles; thus, they might not be the principal area of interest for e-SL.

Target group addressed by the projects: emerged categories	N. of articles
Education-bound target group: educators, educational institutions, K12, secondary students,	13



Local community: improvement of libraries, infrastructure, general public, parents with children	12
People with special needs: disadvantaged, behavioural problems, developmental disorders, students in rural areas	11
Race/ethnicity-bound group: immigrants, minorities	2
Culture-bound institutions: Archives of US art	2
NGOs: retirements houses, foster homes, shelters, low income groups	7
Business	2
Not stated	15
TOTAL:	64

Table 2. Target group addressed by the projects.

Note: in the analysis, we thoroughly analysed the core research subject of the article in debate and decided to classify it in one (the dominant) category only.

3.2.1.3. Social needs addressed and impact level

Categories of social needs addressed by the projects are illustrated in Table 3.

In terms of social needs addressed by the projects in debate, the most numerous categories were: Education in general, including conscious parenting, youth development, raising awareness, learning opportunities for distant areas (13 articles) and Global issues such as poverty, underprivileged, inclusion in social equity, diversity, global sustainable development, educational opportunities in distant areas (11 articles) which dramatically outscored the other categories. It seems that e-SL focuses on improvement of educational opportunities, rising awareness of various education-related areas (e.g. topics, difficult school subjects) respond to the most urgent issues nowadays.

The third most analyzed category was ITC development, including online support in distant learning (5 articles). Quite unexpectedly, the category COVID 19-related issues was directly addressed only by 2 articles, even though several other articles focused on Covid-19-related or caused issues (such as online education; economic disparity, access to education, etc.). However, in the analysis, we thoroughly analysed the core research subject of the article in debate and decided to classify it in one (the dominant) category only.



The Categories “Cultural community welfare (oral histories) and “Specific community welfare” (community infrastructure, reorganisation of libraries) scored 5 projects in total, thus, general community welfare might also be considered an area of interest.

Social need addressed by the projects: emerged categories	N. of articles
Education in general (incl. conscious parenting, youth development, raising awareness, learning opp. for distant areas)	16
Global issues: poverty, underprivileged, inclusion in social equity, diversity, global sustainable development, educational opportunities in distant areas	11
ITC development (incl. Online support in distant learning)	5
Immigration, social justice	4
Specific community welfare (community infrastructure, reorganizing of libraries)	3
Health, community health (incl. Reorganization of health services...)	3
Covid-19 related issues	2
Cult. community welfare=oral histories	2
Business (incl. translations...)	2
Not stated	16
TOTAL:	64

Table 3. Social needs addressed by the projects.

In terms of impact level of the e-SL projects, out of 64 analyzed studies, most of them belong into the category of local impact level (26), followed by international (10) and national (8) impact level. The level could not be determined in 16 projects. Finally, 4 projects combined two or more impact levels.

3.2.1.4. Number of students involved and e-SL project duration

The ranges of the number of students involved in the projects are shown in Table 4. Out of 64 analysed projects, only 57,8% of studies mentioned numbers of students involved in e-SL (N=37). Out of them, 9,3% were projects with “very small” or “small” numbers of students involved (between 5-20); 17% were projects with “relatively small” (between 21-40) numbers of students; 15,6% were projects with relatively large (41-70) numbers of students; and 14%, mention large number of students involved (between 100- 300). Only one project mentioned



an extremely high number of students (1900), but this was the sum of students in more modules of e-SL in the specific project.

Project with very small numbers: Projects with less than 10 students	2
Projects with small numbers of students: Projects with 11 – 20 students	4
Projects with relatively small, classroom-size-numbers of students: Projects with 21 - 30 students	6
Projects with 31 – 40 students	5
Projects with relatively large numbers of students: Projects with 41 – 50 students	4
Projects with 51 – 60 students	3
Projects with 61 – 70 students	3
Projects with large numbers of students: Project with more than 100 students (and less than 300)	9
Projects with a high number of students over several modules (1900)	1
Not stated	27
TOTAL:	64

Table 4. Number of students involved in e-SL projects.

In terms of e-SL project duration out of 64 analyzed projects, almost 70% of studies mentioned it (N=45; see Table 5). Out of them, more than half – 56,2% projects lasted between 10-16 weeks /1 semester /3-4 months; 15,6% of projects lasted 1 year or 2 semesters; only 4,6% lasted 3 semesters (without a note if it was a duration of one course or 1 course repeated in two-three semesters). The same number, 4,6% of projects were shorter projects/modules, less than 1 months; also, the same number of projects/courses was running for more than 2 years and one of them for more than 10 years.

Shorter modules /several days/weeks	1 semester. Between 10-16 weeks	2 semesters / 1 years	3 semesters	Longer (more years/ongoing)
3	26	10	3	3

Table 5. Duration of the e-SL projects.

3.2.2. Type of e-SL and technology interaction

To answer the question of how are e-SL projects developed in terms of virtual design, we used four types of e-SL practices (Waldner et al. 2012):



1. e-Service-Learning Hybrid Type I service is provided on-site, and teaching is organised fully online;
2. e-Service-Learning Hybrid Type II service is provided fully online with teaching fully on site. The lessons take place entirely in the presence, and the service usually involves the creation of online resources as a response to an identified need;
3. e-Service-Learning Hybrid Type III is a blended format with instruction and service partially online and partially on-site;
4. Extreme e-Service-Learning (Xe-SL), 100% of the instruction and service is online. There is no on-site component.

Applying these categories to the selected studies (see Figure 5), most of the analyzed e-SL projects (19 projects) were in the category of Extreme e-SL type. The second biggest group was e-SL projects (in total 13) organized as a mixed experience in e-SL Hybrid Type II. 7 projects were of e-SL Hybrid Type III and 5 projects were of e-SL Hybrid Type I. In 4 studies were different types of e-SL and in 16 studies we were not able to identify typology of e-SL project.

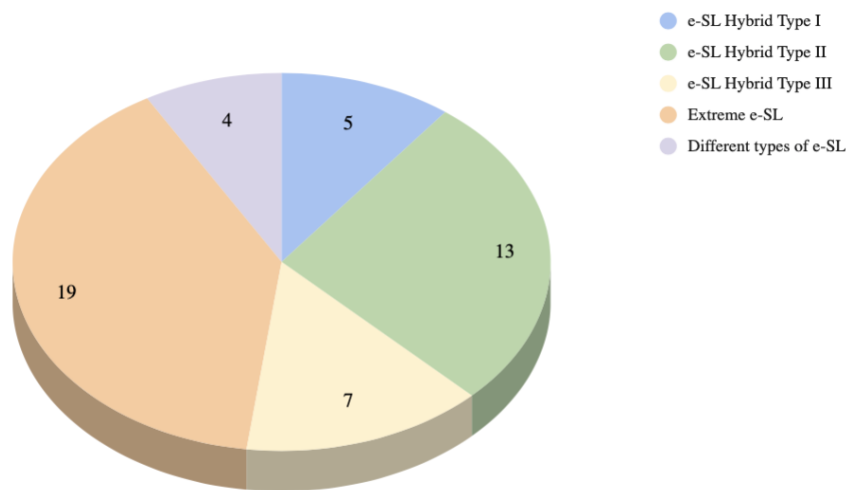


Figure 5. Type of e-SL projects in terms of virtual design.

In terms of interaction with project beneficiaries, in most cases the interaction was virtual (25 studies) or mixed (19 studies); in only 3 cases the interaction with project beneficiaries was



face-to-face. In 20 cases it was not possible to identify the type of interaction with the beneficiaries

Regarding technological “immersion” of the e-SL projects we analyzed the 64 studies starting from the categorization of Culcasi et al. (2021). In this classification, technological interaction is defined based on the complexity in which technology and digital devices are incorporated into the e-SL and based on the levels of competence in the digital, personal, and social sphere required of students. This categorization defines 4 types of technological interaction:

1. Technological interaction Type I – *Instrumental channel*: technology is basically the medium to implement both the service and the learning components that, where it is not for a state of necessity, would occur without technology. As such, the learners do not need any special technological expertise.
2. Technological interaction Type II – *Integrated channel*: technology remains the service and learning channel, but in this case, the inclusion of technology is the result of an intentional design decision. As such, it requires students to be digitally literate in order to fulfil the solidarity service.
3. Technological Interaction Type III – *Instrumental objective*: technology is the service and learning goal; it requires students to learn to use existing ICT tools related to their future career field while doing community service, but does not involve the creation of new technological tools.
4. Technological Interaction Type IV – *Integrated objective*: technology is the objective of the learning and service components and also includes the creation of new digital tools. Thus, students need advanced technological skills.

For the summary of the analysis see Figure 6. In our corpus of analysis: the most widespread technology interaction type is the instrumental channel type (13 studies) followed by instrumental objective type (10 studies), integrated channel type (7 studies) and integrated objective type (3 studies). In 29 studies we were not able to identify the type of the technology interaction in the e-SL project. Thus, it seems that the potential of technologies in terms of interaction in e-SL projects is not yet sufficiently exploited.

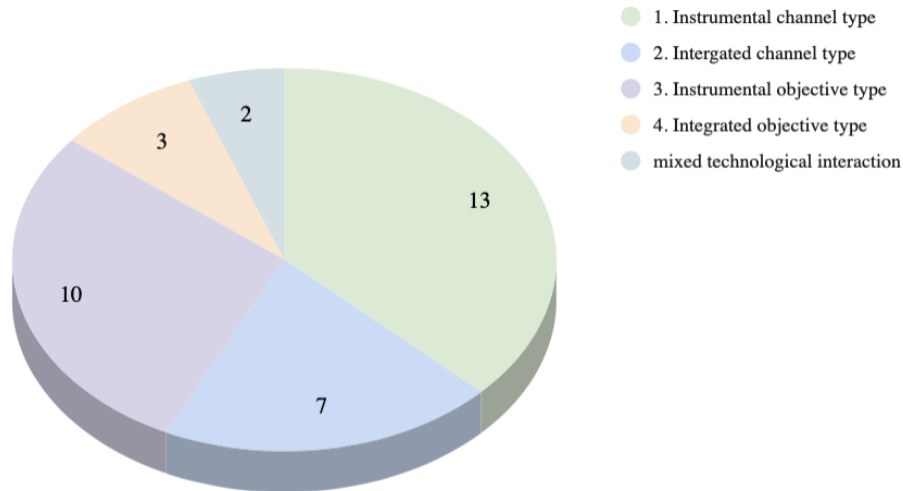


Figure 6. Types of technological interaction in e-SL projects.

3.3. What types of research are available in the literature, what are their main objectives and results? In particular, what are the frameworks adopted for e-SL? (RQ3)

3.3.1. Literature overview: research, objectives and results

Out of 64 analysed studies, 6 studies were theoretical studies (non-empirical), 5 studies were literature reviews (non-empirical), 2 studies were normative studies (non-empirical), while 19 studies examined the impressions of students, recipients or community organisations involved in e-SL (empirical). Also, 19 studies measured the perceived outcomes or benefits of students participating in e-SL (empirical), while 13 studies were both examining the impressions of students, recipients or community organisations involved in e-SL and measuring the perceived outcomes or benefits of students participating in e-SL.

The sample in the above-mentioned studies varied from as low as 10 university students to as high as 1900 students. Both the undergraduate and graduate students were represented in the sample from a variety of fields and countries. Also, at least three studies had faculty advisors (tutors) as part of their sample. In two studies the sample consisted of research papers instead of college students.



Regarding the research method, 41 out of 64 papers were classified as case-based studies, 9 papers were experimental studies, 5 were quasi-experimental studies while 9 were theoretical studies. Nineteen (19) studies used a mixed method, 11 used a quantitative method, while 19 used a qualitative method. Quantitative and qualitative data were mostly collected using questionnaires / surveys, although some studies employed focus groups, observation and interviews. Furthermore, reflection questions, journal entries, field notes, final projects, and final reflection papers, discussion-forum postings, project documentation review and evaluation rubrics were also used as research instruments.

The objectives of the studies were to compare the experiences, academic achievements and critical thinking skills of both undergraduate and graduate students who completed online service and those who completed service on-site and to report whether these experiences were similar or not.

These studies aimed to discover whether e-SL experience delivers the same benefits to students and organisations as it does in a traditional classroom setting, does such experience have an effect on students' general self-efficacy, generic skills, civic beliefs and values and does this effect differ between fully online and hybrid model groups of students.

Also, the objective was to analyse the perceptions of the university students, the impact of virtual communication processes and online tools on student and partner engagement, instructional scaffolds that were used to facilitate e-SL, challenges and issues the instructors encountered facilitating e-SL and suggestions or implications that the current research has for future exploration of e-SL

Furthermore, some papers aimed to present the successful adaptation of a SL project to an online format, share experience with e-SL and provide examples of facilitating e-SL in a virtual setting.

One of the objectives was to clarify the mediating roles of students' attitudes concerning online civic responsibility (OCR) and online civic engagement.

The aim was also to explore how instructors and community partners were able to adapt (or not) SL opportunities to accommodate virtual and hybrid course content delivery.



Finally, the objective was to determine whether e-SL can increase the accessibility of SL for more students who may not otherwise be able to take time outside class and travel to on-site partner sites.

Regarding the outcomes, both the quantitative and qualitative data support the fact that students, in both face-to face and online setting had an overall positive experience. Results demonstrate no significant differences between the traditional and online scores on practical skills, interpersonal skills, citizenship and personal responsibility. Students reported similar learning outcomes and did not significantly differ in their responses.

But, SL experience affected civic efficacy of the fully online group differently than the hybrid model group. Also, adult students who participated in on-site service scored higher in civic responsibility learning outcomes than adult students who participated in online service. There was no significant difference found in overall attainment of learning outcomes, or in any other individual subcategory.

Hybrid strategy of SL that combines both face-to face and online delivery can promote students' generic skills such as: online collaborative skills, teamwork, global citizen, scholarship, adaptability, professional skills, contribute to the classroom and community and take greater responsibility for their education.

Positive changes were recorded in cognitive behavioural competencies, awareness of community needs, interest in the course, learning and applying course material, youth development competencies, responsibility to help others in need, service leadership attributes, as well as life satisfaction after taking the SL course in spite of its online/offsite mode of delivery.

Students addressed issues linked to COVID-19, found their community engagements to be empowering and reported that they felt less isolated and more positive about living in a pandemic when they could contribute to another person's well-being.

e-SL courses delivered to interdisciplinary students provide rich opportunities for reflective and collaborative learning.

The remote engagement allowed the students to reflect on the contextual validity of theory, develop cross-cultural insights and acquire knowledge and skills in problem solving which have implications for their future careers.



Also, there seemed to be a greater sense of responsibility and commitment of students that motivated most teams to exceed expectations.

Regarding the community benefits in e-SL, digital opportunity for rural areas has linked university and distant communities. Also, communities in online settings had new needs.

3.3.2. Frameworks adopted for e-Service-Learning

Out of analysed papers, 12 adopted the e-SL framework proposed by Waldner et al. (2012) who identified 4 types of e-SL: Hybrid Type I (service fully on site with teaching fully online), Hybrid Type II (service fully online with teaching fully on site), Hybrid Type III (a blended format with instruction and service partially online and partially on site), and extreme e-SL (100% of the instruction and service online).

Anderson & McFarlane (2010, pp. 172) adopted “Community-as-partner framework” with four concepts that are central to nursing – person, environment, health, and nursing. *Person* is a population or an aggregate. Everyone in a defined community (total population) or aggregate (the elderly, teens, nurses) represents the person. *Environment* may be thought of as a community (i.e., a network of people and their surroundings). *Health* in this model is seen as a “resource for everyday life, not the objective of living. [It is] a positive concept emphasising social and personal resources, as well as physical capacities” (World Health Organization, 1986). Nursing, based on definitions of the other three concepts, is prevention. That is, all of nursing is considered preventive: primary prevention is aimed at reducing possible encounters with stressors or strengthening the lines of defence (e.g., sunscreen to prevent skin cancer; immunizations); secondary prevention occurs after a stressor crosses the line of defence and causes a reaction, and it is aimed at early detection to prevent further damage (e.g., breast self-examination); and tertiary prevention aims to maintain and restore a more-or-less healthy state (e.g., rehabilitation, meditation).

Shand, Farrelly & Costa (2016, p. 379-380) defined 4 principles for blended learning course redesign:



1. Course redesign needs to focus on the objectives of the course, not on the technologies (Alammary et al., 2014; Garrison & Vaughan, 2008; Hoffman, 2006; McGee & Reis, 2012),
2. Content delivery mechanisms, student engagement activities and assessments should be based on course content, learning needs of students, and pedagogical affordances of the designated technology tools (Garrison & Vaughan, 2008; Massie, 2006; McGee & Reis, 2012; Means et al., 2013),
3. Online and face-to-face components of the course need to be integrated into a comprehensive whole (Garrison & Vaughan, 2008; Hoffman, 2006; Glazer, 2011; McGee & Reis, 2012),
4. Blended courses should begin with an orientation to teach students how to successfully navigate the online components of the course and prepare for the face-to-face meetings (Garrison & Vaughan, 2008; Hoffman, 2006; Jones 2006).

As Shand, Farrelly & Costa (2016, p. 3W79) pointed out, Torrissi-Steele and Drew (2013) found that effective blended learning required extensive course redesign integrating technology to create student-centred learning experiences.

Herrington and Kervin (2007) suggested that authentic learning environment supported by technology should have the following characteristics:

- Provide authentic context that reflect the way the knowledge will be used in real life (e.g., Brown, Collins, & Duguid, 1989; Collins, 1988; Gulikers, Bastiaens, & Martens, 2005),
- Provide authentic activities (e.g., Brown, Collins, & Duguid, 1989; Cognition and Technology Group at Vanderbilt, 1990; Jonassen, 1991; Young, 1993)
- Provide access to expert performances and the modeling of processes (e.g., Collins, Brown, & Newman, 1989; Lave & Wenger, 1991),
- Provide multiple roles and perspectives (e.g., Bransford, Sherwood, Hasselbring, Kinzer, & Williams, 1990; Honebein, Duffy, & Fishman, 1993; Lave & Wenger, 1991; Spiro, Feltovich, Jacobson, & Coulson, 1991),



- Support collaborative construction of knowledge (e.g., Bransford, Sherwood, Hasselbring, Kinzer, & Williams, 1990; Brown, Collins, & Duguid, 1989),
- Promote reflection to enable abstractions to be formed (e.g., Boud, Keogh, & Walker, 1985; Norman, 1993),
- Promote articulation to enable tacit knowledge to be made explicit (e.g., Lave & Wenger, 1991; Pea, 1991; Vygotsky, 1978),
- Provide coaching by the teacher at critical times, and scaffolding and fading of teacher support (e.g., Collins, 1988; Collins, Brown, & Newman, 1989; Greenfield, 1984; Harley, 1993),
- Provide for authentic, integrated assessment of learning within the tasks (e.g., Gulikers, Bastiaens, & Kirschner, 2004; Herrington & Herrington, 1998; McLellan, 1993; Reeves & Okey, 1996; Young, 1993, 1995).

Lypka (2018) presented a Community-based Visual S-L and Research Model defined as a compassionate, reciprocal SL model to traverse the academia community, disciplinary-interdisciplinary, print literacy-multiliteracy, and the L1-L2 fluency binaries, ameliorate pressing social problems (Berman & Allen, 2012; Kennerly & Davis, 2014). In the author's vision, traditional SL is enriched by the contribution of visual methods such as photovoice or videovoice. To advance participatory digital visual SL scholarship in TESOL (Teaching English to Speakers of Other Languages), the author describes the implementation of a videovoice to stimulate LESLLA (Literacy Education and Second Language Learning for Adults) advocacy and L2 investment in a community-based program while fulfilling the demand to prepare preservice teachers to effectively apply linguistics, technology, and instructional techniques with adult LESLLA learners.

Seru (2021) proposed a critical Service-Learning framework that includes social justice and critical consciousness competencies such as attention to power dynamics, authentic relationships, and a systems-level analysis of social problems (Daigre, 2000; Mitchell, 2008). The key elements of critical service-learning according to Seru (2021) are: attention to power dynamics, authentic relationships, and systems-level analysis of social problems.



Mishra and Koehler's (2006) TPACK framework describes implementation of educational technology in classrooms by differentiating between technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). This framework explains how content and pedagogy should form the foundation for effective educational technology integration. The technology being implemented must communicate the content and support the pedagogy in order to enhance students' learning experience.

Salam et al. (2019) proposed a Technology Integration Framework for Service Learning (TIFSL) which comprises of 3 main components:

1. identification of common phases for service learning implementation, which are drawn on Kolb's (1984) experiential learning theory,
2. technology support layer and
3. stakeholders' involvement patterns in service learning.

The authors suggest that educators should integrate suitable technologies in all phases of Service-Learning, depending on the nature and objectives of their projects; different projects require different needs, Service-Learning is not one size fits all.

3.4. How do virtual learning spaces challenge Service-Learning experience? (RQ4)

The question of whether SL in an online environment is feasible or not is a legitimate one. Indeed, as Cook-Benjamin (2015) states, adapting SL from the in-person to the online environment is not easy because SL is an immersive, challenging and highly personally involved activity. So, in order to determine whether or not SL is viable in an asynchronous or distal learning environment, we need to understand what the obstacles and challenges are. As Guthrie & McCracken (2010b) state, creating a virtual teaching and learning environment is a challenge in itself. It requires capturing and nurturing both teaching moments that occur during planned web-based activities and spontaneous service-based learning experiences.

The analysis of the articles reveals several challenges that can be classified in 5 areas:

1. the area of participation;
2. the area of relational dynamics;



3. the area of project orientation;
4. the area of management and logistics;
5. the area of technology and impact;

3.4.1 Participation

Participation is one of the key features of SL. As Schwehm et al. (2017) state, students doing online SL may not feel part of the community they are serving. Thus, the first challenge is to develop a sense of belonging to the community (Cook-Benjamin, 2015). In this sense according to Leung et al. (2021), the search for one's purpose within the community without "human contact" can be challenging for some. As Harris (2017) points out, even if students are familiar with the community they may feel they have not really interacted with it, as the SL immersion does not allow the same participation in the online dimension. Considering only the students' side, participation is particularly challenging. According to Cook-Benjamin (2015), in a virtual environment, peer motivation is much more difficult. In this sense, according to Harris (2017, p. 50), during the group work, although some students naturally contribute more than others, a common problem is: "the occurrence of 'free-riders' who obtain, with little cost or effort, the benefit of grades earned by industrious members of the group". Therefore, participation also poses a challenge of student leadership. Establishing co-leaders among students can be very challenging when not everyone is actively involved; as Cook-Benjamin (2015) states, students often don't know each other, have no idea of each other's strengths, weaknesses or interests, or know each other's schedules, and the virtual environment is a particularly challenging space for this kind of task. Participation is also challenged by the lack of face-to-face contact and interaction between students, community partners and teachers.

3.4.2 Relational dynamics

The virtual dimension can alter some important interpersonal dynamics in SL. For example, as Guthrie & McCracken (2014) states, in large online classes students may be reluctant to share their emotional reflections with such a large number of people. In this line, Shah et al. (2018) state that the students found it difficult to express their points without face-to-face conversation. Furthermore, according to Waldner et al. (2010), even if students in



online sessions log in, they do not necessarily engage in the discussion, so there is an imbalance towards the instructor. This is why according to Cook-Benjamin (2015) one of the significant barriers to the implementation of service learning in the online environment are the learners themselves: especially those who are not familiar with SL might not want to attempt such a project. In general, according to Seru (2021), a faculty member's ability to build trust and rapport in a classroom decreases dramatically in a virtual environment. For a faculty member using the audio-visual input of the webcam/headphones, it is much more difficult to see how students are reacting and processing information if they have the cameras off and if they are only using the chat function during class.

3.4.3 Project orientation

Another important challenge for e-SL is the right project orientation which, if inadequate (Marcus et al., 2020) can lead to undervaluing the opportunities offered by the SL (Marcus et al., 2021). Bharath (2020) and Preradovic et al. (2012) point out that a lack of clarity can create a conflict of expectations with partners. The cultural dimension is also part of the project orientation: according to Harris (2017) and to Semenski et al. (2017), while working with students from different backgrounds is enriching, it is also complex. Stefaniak (2020) states that cultural diversity can make students feel disconnected from the community they are serving.

3.4.4 Management and logistics

Most articles mention time management and organisational aspects (e.g. Bharath, 2020). Budget constraints are also frequently discussed (e.g. Gasper-Hulvat, 2018). Guthrie & McCracken (2010b) reports a significant design challenge in terms of project management and facilitation. They specify that challenges to facilitating e-SL increase when large course sizes have to be managed. These organisational challenges refer to student team management, and the distribution of the group assignments (Preradovic et al., 2012). In this regard, Schwehm et al. (2017) states that the most challenging aspect of e-SL occurs when the instructor manages multiple projects with multiple partners. Marcus et al. (2020) and Ezeonwu et al. (2014) mention the challenge of building and maintaining community partnerships, and the difficulty



of creating opportunities for students' engagements. According to Seru (2021) not all partners may want to adapt to the online dimension, or may need additional organisational training.

3.4.5 Technology and impact

The studies analysed point to challenges with the internet: access problems, management and unexpected issues, poor connections or outdated equipment. Harris (2017) states that the more technology takes a central role the more 'human connection' will be lost. In this line García-Gutiérrez et al. (2021) highlights the difficulty of doing personalised project monitoring; Chen et al. (2011) highlights the difficulty of talking with students' webcams switched off. Lin and Shek (2021) stresses, in particular, the concern that doing indirect SL through technology while bringing learning benefits to students, may not sufficiently meet the needs of the community.

3.5. What are the quality elements of the projects analysed and what are the design principles for e-SL? (RQ5)

There are multiple factors influencing learning and student achievement in e-SL activities, but the quality of the lived learning experience is paramount. Paniagua and Istance (2018) highlighted that research on the general principles of good teaching had shown that effectiveness is not determined primarily by the “surface level” of specific teaching methods or ways of organising students, but rather by the “deep level” of instruction, i.e. the quality of interactions between teachers and students around meaningful content (Paniagua & Istance, 2018, p. 22).

As shown in the previous sections, there are already some approaches to define and analyse discrete practices and design principles of e-SL. In the context of the current project, we grounded the work on e-SL design principles in peer reviewed articles presenting a diverse range of experiences and projects. Compiling examples of e-SL practices has called for decisions about granularity and generality. The need for guiding future practices oriented the decision to compile clusters or families of e-SL design principles rather than to list them.

While e-SL certainly does have specific disciplinary pedagogical choices that influence design and facilitation, Lucas and Thomas (2021) argued for a generalised



framework. Following the same line of thought, an **e-SL Design Framework** was developed to provide a comprehensive tool that could help teachers, university leaders, community partners, and other stakeholders to design effective and meaningful e-SL activities (see Figure 7).

The framework incorporates three **pillars of the ‘new culture of learning’** - places, people, and partnerships (Thomas & Brown, 2012) – that interconnect **four clusters of design principles** with the intention of promoting **student engagement**.

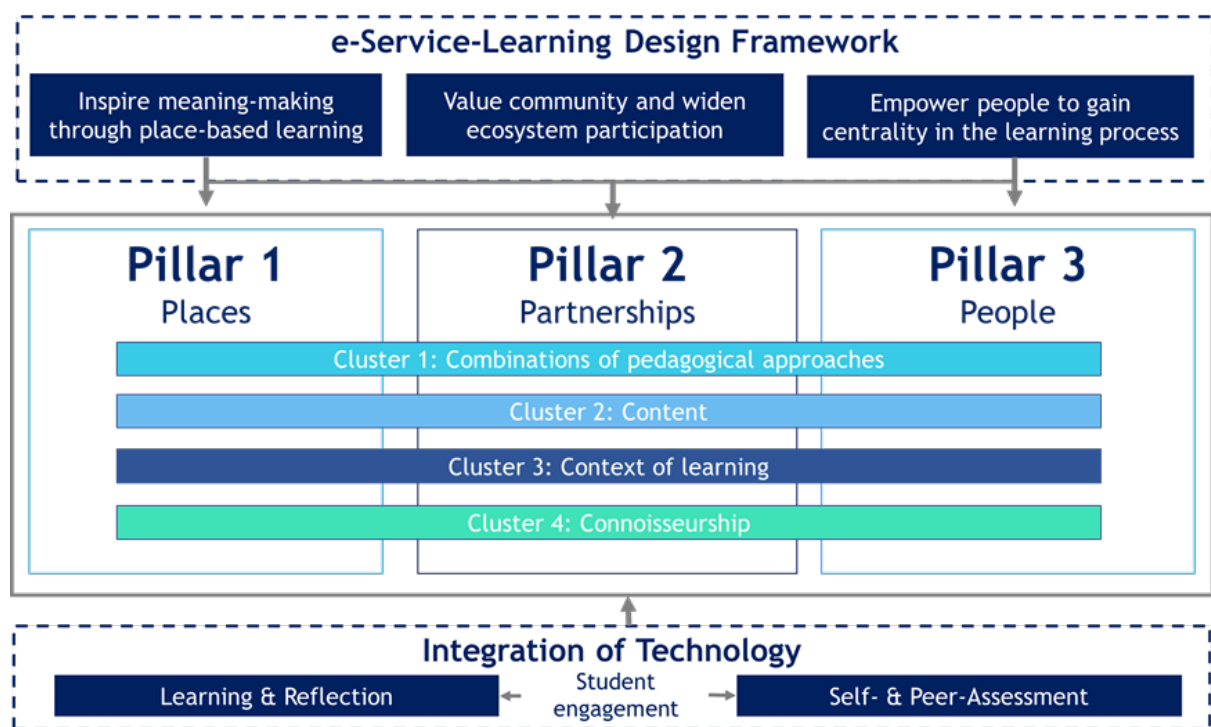


Figure 7. The e-Service Learning Design Framework

3.5.1. The Pillars

The e-SL Design Framework is built on three pillars – **places**, **partnerships**, and **people** – that translate an ecosystemic approach to learning in higher education. For successful implementation of e-SL, the three pillars could orient the process of curriculum design, course design, service design and, nevertheless, learning experience design. In other words, the pillars are structural directions of the design process having the potential to support the uptake of



student engagement and achievement across the four clusters. Widening ecosystem participation relies on people and partnerships to provide a platform for student engagement. Complementarily, diversifying the **places** where learning takes place is an important strategy to support e-SL and remove geographical barriers with the aid of technology. Additionally, place-based learning connects knowledge with their context with the intention of promoting meaning making and identity building (Winthrop et al., 2018).

3.5.2. The Clusters

In the framework of e-SL Design Principles, the concept of cluster is central. A cluster is a family of principles and actions across pillars, intended to achieve meaning-making and effective e-SL experiences design. The name and the nature of clusters were inspired by the [Cs Framework](#) developed by OECD under the project *Innovative Pedagogies for Powerful Learning (IPPL)*.

Cluster 1: Combinations of pedagogical approaches

Previous analyses revealed that no consensus regarding course or service design was achieved. Consequently, the integration and implementation of e-SL projects do not rely on one pedagogical approach exclusively. Conceptualising, a pedagogical approach implies the use of several specific methods combined in systematic ways (Paniagua & Istance, 2018, p. 22). Our analysis revealed that combinations of pedagogical approaches strengthened the power of both established and innovative pedagogies in e-SL. The approaches analysed demanded collaboration, discussion, reflection, and engagement with the communities. Two layers of combinations could have been identified: **methodological** and **organisational**.

Diversifying the approaches and methods is key to achieving student engagement. Service-learning and therefore e-SL are *per se* innovative experiential approaches to learning. Nevertheless, pedagogical combinations of e-SL with *research-based learning, challenge-based learning, gamification, flipped learning or discussion-based teaching* proved to be effective in several contexts (Ezeonwu et al., 2014).

From an organisational perspective, **horizontally-** and **vertically-integrated** approaches were successfully applied to organise e-SL. As Hagan (2012) pointed out, mixed



teams of different specialisations (horizontal integration) as well as teams of undergraduate and graduate students could collaborate on e-SL projects. **Co-creating** e-SL with both students and community partners could lead to greater impact. Buglione (2012) found that adult/non-traditional students felt they could have a greater impact on their local community if they could determine their own service-learning site placement. Similarly, Preradovic et al. (2012) concluded that at the end of a e-SL project aiming to develop an educational corner for a community partner, the students perceived themselves as partners in the learning process (not the objects of that process), able to make a difference in their local communities (Preradovic et al., 2012).

The integration of technology (see Cluster 4) allowed for combinations of **synchronous** and **asynchronous learning** activities. McGorry (2012) suggested that social networks such as Facebook or Twitter might engage students through asynchronous discussions or polls. Complementary, wikis, podcasts, or reflection tools (Lucas & Thomas, 2021) could enhance asynchronous learning in e-SL projects. In line with the three structural pillars, a multidimensional set of possible principles and roles to guide further action is summarised in Table 1.

Table 1. Cluster 1 e-SL design principles and quality elements for learning and teaching

Principles related to Cluster 1	Learners	Teaching
Learner centrality & engagement	Contribution to course and/or service co-design Choose the focus of learning Evaluate and create learning challenges Work with others for solving challenges Reflect and self-regulated learning	Teachers and other community representatives play the role of 'learning activators' Learning is designed to foster independence and agency through pedagogical innovation (e.g. Lorie Cook-Benjamin & Chapman Rackaway, 2015)



Constructive alignment	Learners are aware of the learning path and personalise it to adjust to their needs and interests Learners engage in synchronous and asynchronous activities	Each activity is linked by design to specific learning outcomes Clear structure of the program/course Explicitly clear sequencing of learning activities within a course Feedback is based on peer reviewed and instructor-led modalities
Horizontal integration	Connectedness to the community Connectedness to students from various fields of study or specialisations	Connecting across subjects and topics Service is designed around societal challenges
Vertical integration	Undergraduate and graduate students engage in multidisciplinary teams	Projects are usually long-term and large scale

Cluster 2: Content

Unquestionably, embedding e-SL into curriculum and course design is strongly influenced by the various knowledge domains and fields of study. Apart from the domain-specific body of knowledge, the transversal skills or **human literacy** get new accents (Kamp, 2019). A major requirement when designing and structuring a program or a course integrating e-SL is to be aligned with the needs of the world of work or societal needs, to **design learning for impact**. Impact-focused education accentuates experiential learning and is meaningful for students. Whenever possible, the thematic approach across disciplines with **real-world connections** should gain centrality to make learning relevant (see Ter Horst & Pearce, 2010). In a theoretically diverse context, **student choice** and **flexibility** could thereby increase agency and self-awareness, as Ezeonwu et al. (2014) suggested. The cited authors described an experience where the community practice component complemented the thematic mix which allowed students to apply their knowledge to problem solving while stimulating critical thinking.



Table 2. Cluster 2 e-SL design principles and quality elements for learning and teaching

Principles related to Cluster 2	Learners	Teaching
Merge academic content with e-SL and other pedagogies to boost learning outcomes	Students work in multi- and interdisciplinary teams to explore, investigate, offer relevant services to communities, and reflect on their learning process.	Develop clear academic and civic learning outcomes. Following the connoisseur principles (see Cluster 4), determine an appropriate combination of academic content and e-SL to support student achievement. Embedding e-SL into the educational content requires purposeful design.
Increase the breadth of student experience		Design learning beyond knowledge domains and disciplines through horizontal integration. Teachers could frame activities as problems to be solved or link them to wider challenges (see Harris, 2017) to offer students a global outlook and perspective.

Cluster 3: Context of Learning

Context influences pedagogical appropriateness and effectiveness, but context also shapes who is learning and what is relevant to the students (Paniagua & Istance, 2018, p. 24). **Individual, social, and cultural backgrounds** are key contextual factors to be addressed. Non-traditional and vulnerable learners were found to benefit from e-SL. The **flexibility** in achieving the learning goals, the social regulation of learning, and peer interaction were proven to boost the **enjoyment of learning**, reduce cognitive load, and increase **motivation**. By requiring regular interaction on a variety of levels but most importantly occasional synchronous communication, instructors can contribute to **community building** among students which



appears to be a prerequisite to successful virtual service-learning projects (Cook-Benjamin & Rackaway, 2015). Other studies reported as equally important for the success of e-SL the development of a **sense of belonging** to the communities (Preradovic et al., 2012; Ter Horst & Pearce, 2010). Table 3 summarises the design principles associated with cluster 3 and their respective actions and roles.

Table 3. Cluster 3 e-SL design principles and quality elements for learning and teaching

Principles related to Cluster 3	Learners	Teaching
Sensitive integration of learners' differences	Individualised approaches could boost motivation and achievement.	Student differences in terms of cognition, motivation, prior knowledge. and experience are equally important. e-SL can be enriched with other pedagogies to allow for self-paced learning (e.g. flipped classroom), peer interaction and feedback and asynchronous learning. Micro-adaptations can be foreseen to provide additional support and guidance for students in need or at risk. Flexible design could allow for students to choose ways of working and grouping based on their personal preferences.
Partnering with communities	Students apply knowledge and skills in communities and connect scholar knowledge with real world needs and, at the same time, build a sense of belonging to the communities.	Community representatives are 'learning catalysts' in e-SL. To assume this role, the partnership with the communities must be aligned to learning outcomes. Moreover, the community partners will contribute to the co-creation of the learning path, shaping sometimes the nature of learning activities, their sequence, and the design of the service.



Building communities of students	Students cooperate and socially regulate their learning	This principle builds upon the social nature of learning. Technology is used to create flexible learning settings and facilitate the production and transfer of knowledge – i.e. learning stations (Wenger, 1998).
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Cluster 4: Connoisseurship

Designing e-SL for effective learning requires complex pedagogies and innovative approaches. In this context, the concept of *connoisseurship* highlights the idea of **expert teachers** and **application of pedagogies** (Paniagua & Istance, 2018). In e-SL, the service is an opportunity to apply knowledge and skills and deepen the learning through reflection. Therefore, the focus is on the activation of **deep learning strategies** which rely on a ‘living’ pedagogical design (Andrade, 2019; Panadero et al., 2016). Previous studies focusing on service learning in online technical writing courses revealed that the approach helped students to make connections to the real world, encouraged them to connect with their audience(s) and develop a sense of purpose for writing tasks, and fostered the use of deep learning strategies (Soria & Weiner, 2013). The integration of technology at various levels in SL activities is an example where connoisseurship matters. The pervasiveness of technology in e-SL requires the expert deployment of designs that use technology as a complement of teaching to activate learning and collaboration. Moreover, teachers require expert knowledge of technology use and technological pedagogical content knowledge (Koehler & Mishra, 2005) to ensure the transition from the informal use of social media and other virtual environments to a more formal use for learning purposes. Thus, the connoisseurship of technology is transferred from teachers to students to boost students’ capabilities to navigate the environment.

Table 4 unfolds two principles related to connoisseurship and briefly associates roles and quality elements for learners and teachers.

Table 4. Cluster 4 e-SL design principles and quality elements for learning and teaching



Principles related to Cluster 4	Learners	Teaching
<p>Activation of deep learning strategies (Panadero et al., 2016)</p>	<p>Choose the focus of learning (i.e. the community and the type of service) Manage learning individually or collaboratively Involve in learning challenges and produce various learning outputs</p>	<p>The pedagogical design integrates metacognitive scaffolding and self-regulation techniques and tools. The sequence of learning activities should increasingly and constantly challenge the learner to understand more difficult input and produce more complex output. Learning is complemented with formative feedback and assessment for learning Communities and community representatives are, by design, a part of the teaching and learning process.</p>
<p>Technology is pervasive</p>	<p>Use technology savvily for learning purposes, to scaffold reflection and self-regulation, to collaborate and disseminate the learning outputs</p>	<p>Technology is expertly and savvily embedded into the learning process. If needed, explicit teaching of technology use is embedded into the structure and sequence of learning activities. The pedagogical design uses technology to allow for various combinations of pedagogies (i.e. flipped learning, narrative approaches and storytelling, gamification).</p>



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