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THE ROLE OF SERVICE-LEARNING IN INFORMATION SYSTEMS EDUCATION

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ABSTRACT

Aim/Purpose	The aim of this study is to explore the role of service-learning in Information Systems (IS) education.
Background	While the use of modern technologies presents many operational benefits, such as the lowering of the costs, it may also aggravate social-economic issues. IS professionals should account for these issues as well as exhibit the skills demanded by modern-day employers. Hence, why there is a need for IS educators to adopt a new pedagogy that supports the development of more holistic and socially responsible IS graduates.
Methodology	In this qualitative exploratory case study, two IS service-learning courses at a South African university were studied. Interviews, course evaluations, and reflection essays were analyzed to gain insight into the implications that service-learning may have for students.
Contribution	This study contributes to IS education research by advancing discussions on the role of service-learning in providing learning outcomes such as the development of important skills in IS, civic-mindedness, and active participation in society.
Findings	The findings showed that the courses had different implications for students developing skills that are important in IS and becoming civic-minded due to the variation in their design and implementation.
Recommendations for Practitioners	It is recommended that IS educators present their courses in the form of service-learning with a careful selection of readings, projects, and reflection activities.

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Recommendations for Researchers	IS education researchers are advised to conduct longitudinal studies to gain more insight into the long-term implications that service-learning may have for IS students.
Impact on Society	This paper provides insight into how IS students may gain social agency and a better understanding of their role in society.
Future Research	It is recommended that future research focus on mediating factors and the implications that service-learning may have for IS students in the long-term.
Keywords	information systems, service-learning, education, reflection, critical thinking, social awareness, teamwork, community

INTRODUCTION

Information communication technology (ICT) advances are rapidly transforming how organizations and societies function (Cascio & Montealegre, 2016; Topi, 2019). While ICT advances may improve productivity and reduce costs, they may also aggravate unemployment, oppression, and the digital divide (Cascio & Montealegre, 2016; Connolly, 2012). Hence, why there is a need for more holistic and socially responsible Information Systems (IS) graduates.

IS educators should provide students with “educational experiences that are both effective and comprehensive, reaching from technical expertise to new business models and value-based ethical analysis of impact” (Topi, 2019, p. 1). The way in which IT related subjects are taught impacts the quality of learning outcomes being delivered to students (Anderson, 2017; Saulnier, 2005). This supports the need for further research on IS-relevant pedagogies (Topi, 2019).

This qualitative exploratory study will consider service-learning as a potential pedagogy for yielding more socially responsible IS graduates that exhibit both technical and soft skills. Service-learning may be described as a form of experiential learning that involves serving the community (Bringle & Hatcher, 1995; Furco, 1996). So far it is unclear what implications service-learning may have for IS students. This is because there is limited empirical research on the role of service-learning in IS education. This study aims to address this by answering the following research question: What is the role of service-learning in IS education in a developing country context? To answer this research question, both an undergraduate and postgraduate service-learning course have been closely examined at a South African university.

It is expected that this study will contribute to IS education research by providing insight into the role of service-learning in IS education and its implications for learning outcomes, such as the development of important skills in IS, civic-mindedness, and active citizenship. Practically, the study will provide IS educators with insight into means of incorporating service-learning into undergraduate and postgraduate courses as well as highlight some of the expected outcomes.

First, past literature will be reviewed. This will be followed by the research methodology. Findings will then be reviewed and discussed. Subsequently, limitations of the study will be highlighted, and conclusions will be drawn from the findings.

LITERATURE REVIEW

SERVICE-LEARNING

Service-learning may be defined as a rich form of experiential learning that involves community engagement (Fink, 2003; Saulnier, 2005). Some definitions of service-learning tend to place more emphasis on academic learning (Furco, 1996), while others focus more on the service component (Bringle & Hatcher, 1995). Regardless of the focus, the pedagogy must constitute the following four elements, also known as the four Rs (Butin, 2003):

- **Relevance:** Service-learning courses need to be relevant to the different stakeholders by bearing credits (Furco, 1996; Mooney & Edwards, 2001), satisfying community needs (Dalmida et al., 2016), and supporting learning needs through meaningful application of theoretical content (Lee, 2012).
- **Respect:** Students need to respect members of the community and their perspectives, cultural traditions, and efforts to overcome socioeconomic challenges (Butin, 2003; Carver, 1997; Marullo, 1998).
- **Reciprocity:** Reciprocity refers to the existence of mutually beneficial and authentic relationships between students and the community (Bringle & Hatcher, 1995; Martin et al., 2017).
- **Reflection:** Students must reflect critically throughout the duration of a service-learning course or module (Eyler, 2002; Hoxmeier & Lenk, 2003). Critical reflection requires students to embrace ambiguity and question their own assumptions and unjustified beliefs (Bringle et al., 2011; Mezirow, 1997). Transformative learning may be triggered once students start to address their assumptions in response to their introspection (Mezirow, 1997).

FORMS AND IMPLICATIONS OF SERVICE-LEARNING

While various forms of service-learning may share similarities such as the four Rs, they may differ with respect to learning goals, outcomes and approaches as well as in terms of service type and the perspective that individuals may have of service-learning (Bheekie & van Huyssteen, 2015; Britt, 2012; Morton, 1995). Table 1 illustrates the various forms of service-learning.

Table 1. Forms of service-learning

	Implication for Students	Learning	Perspectives of Service-Learning	Service-Learning Forms by Purpose	Service-Learning Forms by Type
Longer Timeframe Greater Concern for Causes More Investment in Relationship-Building Greater Impact of Social Change More Significant Learning (Britt, 2012; Butin, 2003; Morton, 1995)	Skill Set Development	Mainly Cognitive Learning (some Affective Learning)	Technical	Skill Set Practice & Reflexivity	Charity
	Civic-Mindedness	Cognitive & Affective Learning	Cultural Post-structuralist	Civic Values & Critical Citizenship	Project
	Active Citizenship	Cognitive, Affective & Pragmatic Learning	Political	Social Justice Activism	Social Change
	Sources	Britt (2012) Bringle & Steinberg (2010) Hoskins et al. (2006) Butin (2003)	Çakmaklı (2015) Snell et al. (2015) Britt (2012) Butin (2003)	Butin (2003)	Britt (2012)

The arrow represents how service-learning becomes more critical as students invest more time in relationship-building and express a greater sense of concern (Britt, 2012; Butin, 2003; Morton, 1995). This paper will focus on the implications that different forms of service-learning may have for students developing skills, becoming civic-minded, and being actively involved in efforts to promote social change.

Skill set development

Service-learning should assist students in developing skills, competencies, self-efficacy, and critical thinking (Britt, 2012; McLeod, 2017). In the past, service-learning has been used in STEM (Science, Technology, Engineering, and Mathematics) courses to improve the employability of graduates (Santiago-Ortiz, 2019).

Literature shows that employers are demanding more holistic IS graduates who possess both technical and soft skills (Gruzdev et al., 2018; Pratt et al., 2014). The development, operation and management of complex systems and processes in a dynamic environment require IS professionals to work well in teams, analyze complex problems, innovate, and empathize with prospective system users (Whitney & Daniels, 2013). They should also be capable of communicating clearly with a diverse group of people (Karanja et al., 2016; Taylor, 2016). In general, IS professionals should exhibit strong communication skills, such as effective listening, which is considered essential for requirements elicitation (Moody, 2002). Other soft skills that are considered important include courtesy, creativity, and resilience (Taylor, 2016).

There is a general belief that ICTs may be used to support and promote efforts of sustainability (Klimova et al., 2016; Scott et al., 2012). Even though IS theory has been adjusted to include elements of sustainability, there is still a need for students to develop creativity, interdisciplinary thinking, emotional intelligence, and commitment (Sandri, 2013; Scott et al., 2012; Shrivastava, 2010). Literature suggests that service-learning may assist in fostering sustainability-related competencies and interdisciplinary interaction among IS students (Halberstadt et al., 2019; Molderez & Fonseca, 2018).

Civic-mindedness

Service-learning may have implications for students becoming civic-minded (Bringle et al., 2011; Morton, 1995). Civic-minded graduates are characterized as being socially aware and responsible, as well as respectful of diversity (Bringle et al., 2011). Figure 1 shows how these characteristics may be classified into the following four categories: knowledge, skills, dispositions, and behavioral intentions (Bringle et al., 2011; Bringle & Steinberg, 2010).

The pedagogy tends to expose students to different cultures and socio-economic conditions (Schelbe et al., 2014). This might explain why service-learning may support students in becoming culturally competent (Chen et al., 2012) as well as socially aware and responsible (Molderez & Fonseca, 2018; Schelbe et al., 2014). O'Lawrence (2019) highlights the importance of cultural diversity within the workplace as it allows for mutual respect and an increase in productivity by having a positive workplace culture as well as support innovation efforts with the sharing of different perspectives. According to him, individuals may only be successful if they are able to question their own culture and views while being open to that of others.

According to Qureshi (2015), IS professionals should contribute to society in a positive way by supporting development efforts. This relates to the concept of social trustee of knowledge, which refers to students feeling responsible to use their knowledge to better society (Bringle et al., 2011). There is a need for IS graduates with social responsibility and agency. ICT projects tend to fail in developing countries due to design-reality gaps, miscommunication and a lack of infrastructure and evidence-based practices (Heeks, 2002; Heeks, 2008; Mwalemba, 2019). This relates to the need for South African IS students to have a better understanding of how they may effectively use technologies to

address challenges in the South African context which consists of marginalized groups and rural areas with poor infrastructure (Khene, 2015).

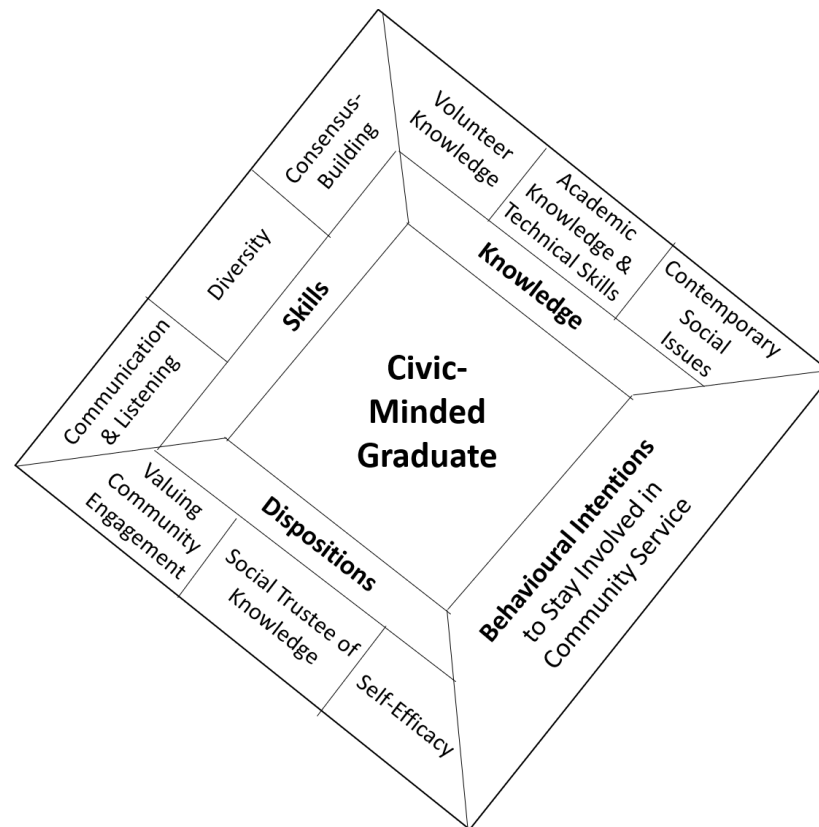


Figure 1. The elements of civic-minded graduate.
(based on Bringle & Steinberg, 2010 and Bringle et al., 2011)

It also has been observed that ICT4D researchers do not closely engage with communities and urge the adoption of policies to promote research (Harris, 2016). ICT for Development (ICT4D) is a field or stream that focusses on the use of ICTs to support development activities (Khene, 2015). It may be argued that ICT4D service-learning projects may provide opportunities for students to interact with multiple stakeholders, work under real-life constraints, and consider both the technical and social aspects of system development (Lopez et al., 2015).

Ethical behavior has become a concern within organizations (Grant & Grant, 2010; Pless et al., 2012) with IT ethical issues being considered as complex (Phukan, 2002). Fleischmann et al. (2011) claims that IS students need to engage with ethical decision-making to become aware of ethical system design and the diverse ethical perspectives that exist within a globalized society and workplace (Fleischmann et al., 2011). Studies have shown that community involvement during degree programs, such as service-learning, may allow students to gain social responsibility (Bringle & Hatcher, 1995; Garibay, 2018). Andrews (2007) also considers service-learning a good pedagogy for ethics-related courses as it allows students to exercise moral judgement.

Active citizenship

The most critical form of service-learning, as seen in Table 1, involves transformational efforts to promote social justice and bring about long-lasting social change (Butin, 2015). Service-learning in its most critical form has the potential for reconciliation (Pratt & Danyluk, 2017), the development of authentic relationships (Mitchell, 2008), deeper reflection (Santiago-Ortiz, 2019), civic action (Lopez

et al., 2015; Winston, 2015), the deconstruction of power relations, and social justice (Asghar & Rowe, 2017; Grain & Lund, 2016). Hence, students may become active citizens (Mitchell, 2008).

Hoskins et al. (2006) define active citizenship as “participation in civil society, community, and/or political life, characterized by mutual respect and non-violence and in accordance with human rights and democracy” (p. 4). Exercising active citizenship may involve community engagement, advocacy and giving rise to social change (Hoskins & Mascherini, 2009).

It is believed that service-learning may support decolonization efforts as students may gain knowledge relating to the local community (Said et al., 2015). The success rate of system projects in developing countries may increase if IS professionals can draw from local context experiences and consequently account for users’ needs, cultural beliefs, perspectives, digital literacy levels, and requirements (Dwivedi et al., 2014; Heeks, 2008). When using service-learning to decolonize IS education, the pedagogy needs to be considered from Butin’s (2003) poststructuralist perspective. Traditional short-term service-learning tends to replicate colonial practices in the sense that students are inserted into communities just for them to leave after the project without a meaningful and long-lasting contribution to the community (Santiago-Ortiz, 2019; Tryon et al., 2008).

METHODOLOGY

A qualitative exploratory case study was conducted to gain an understanding of the role of service-learning in IS education and the implications that this pedagogy may have for the achievement of high-quality learning outcomes within a specific context. The scope of the study is limited to the learning outcomes relating to the development of important skills in IS, civic-mindedness, and active participation.

According to Lazar and Lidtke (2002), service-learning may be incorporated into several different IS courses so that students may learn more about database design, online communities, networking, and human-computer interaction. Students may also provide training or create user manuals. In this study, two IS service-learning courses at a South African university were examined: a third-year Project Management (PM) course, and an honors Service In Context (SIC) course. The PM course is taught in the last year of an IS undergraduate degree program. In South Africa, a Bachelor of Honors degree is a postgraduate qualification in which students are introduced to the process of conducting research (Department of Education, South Africa, 2007). The authors chose to study the PM and SIC course because, at the university, they are the only courses in the IS department that utilizes the service-learning pedagogy. Table 2 highlights the main differences between the two courses.

Table 2. IS service-learning courses

Course	Project Management (PM)	Service in Context (SIC)
Year	2019	2019
Objective	Teaching students about project management practices while exposing them to social issues in their local context.	Teaching students about community engagement and their role in society as IS professionals.
Service	Community projects with NGOs where students need to elicit requirements, find potential solutions, and develop a prototype that addresses the issue on hand.	Students are required to complete 30 hours of community outreach work. This course involves multiple forms of service-learning as students may work on any community project that is STEM-related.
Engagement with Service-Learning Literature	No	Yes (Lectures as well)

Course	Project Management (PM)	Service in Context (SIC)
Reflection	1 Reflection essay where students reflect on their course experience. 1 Presentation on the reflection content.	2 Reflection essays (one per semester) where students reflect on their service-learning experience.
Content Overview	<i>Project:</i> scope management, project planning and estimation, and risk management. <i>Reflection:</i> communication, creativity, critical thinking, leadership, and teamwork.	Community service, power and positionality, perspectives, development, digital activism, and active citizenship.
Level	Third Year (Undergraduate)	Honors (Postgraduate)
Duration	Semester	Academic Year
Credits	18 credits	Part of 2 semester courses of which both are 20 credits each.
Percentage of the Contribution of Service-Learning Activities to Final Mark	Project: 38% Reflection: 16%	16% (8% per semester)

The university's Community Outreach Unit (COU) is an important stakeholder in the implementation of both service-learning courses. At the start of the academic year, the course convenors engage with a (service) program manager at COU to identify potential projects. The university's COU will help arrange and facilitate the first meeting between the students and the community partners to ensure both parties understand what is expected from them. SIC students may source their own projects. The course convenor of the SIC course also outsources individuals to prepare and present the course content.

Case studies involve the use of triangulation (Yin, 2000). It is for this reason that the following data was collected and analyzed: two course evaluations (one per course), 70 reflective essays (34 PM; 36 SIC), a report on the honors course (SICCE), and 11 interview transcripts. The course evaluations and reflective essays were completed and submitted by the students in 2019 near the end of the PM and SIC courses. Unlike the reflection essays, the course evaluations are anonymous and optional. During data processing, all forms of identifiable information were removed, and names were replaced with pseudonyms.

Semi-structured one-on-one interviews were conducted in 2020 with the two course convenors (CC), a program manager at the university's COU, and four former students from each course. The purpose of the interviews was to gain further insight into individuals' course experiences as well as the objectives of the service-learning courses. The interview guides helped to provide rigor. The ability to probe further during interviews provided opportunity to expand on some of the issues or themes that were identified from the course evaluations and reflective essays until data saturation was reached (Fusch & Ness, 2015). Interviews were voluntary and interviewees had the option to withdraw their participation at any time.

A thematic analysis was performed on all the data that was collected. Thematic analysis involves "identifying, analysing, and reporting patterns (themes) within data" in an iterative and flexible yet systematic way such that rich and detailed accounts may be produced (Braun & Clarke, 2006, p. 79). The analysis process also entailed transcribing interviews, conducting a preliminary exploration

analysis, coding, and interpreting the identified patterns. NVivo, a computer-assisted qualitative data analysis software (CAQDAS) was used to support the analysis process.

Themes were first derived from the literature and included concepts from existing frameworks, such as Bringle and Steinberg's (2010) framework, for a civic-minded graduate. During analysis, the coding scheme was adjusted to account for emerging themes and to eliminate redundant themes. It is important to define what classified as a theme within this study (Braun & Clarke, 2006). A theme was any implication that service-learning may have for students, where an implication may be a learning outcome, a skill being developed, a change in a student's behavior or value system, or a new appreciation.

The process for analyzing the interviews was slightly different to the course evaluations and reflective essays in the sense that one of the researchers, also the interviewer and transcriber, was actively involved in the data collection process, and thus was much more familiarized with the data earlier at the start of the analysis process. Nevertheless, equal attention was given to each reflective essay, course evaluation, and interview transcript, as required for a good thematic analysis (Braun & Clarke, 2006). Member-checking was also used to ensure the validity of the findings.

FINDINGS

The findings are reviewed in the following sub-sections. Main themes have been bolded.

SKILL SET DEVELOPMENT

Service-learning may have implications for the development of important skills in IS such as critical thinking, creativity, academic learning, accountability, reflection capabilities, empathy, teamwork capabilities, and leadership.

Both PM and SIC students experienced the courses challenging them to **think critically** by considering problems in-depth and being aware of subjectivity and biases.

"I feel that the most powerful tool that I have acquired is not that of my honours degree but rather that of being a critical thinker." [Vivaan, SIC]

Several SIC felt that the class discussions and readings helped them to think critically. This contrasts with the PM students who felt that the complex nature of the project helped them to think critically.

"... critical thinking was aided by open discussions." [Banele, SIC]

"We had to focus on different aspects -the social and economical impact. And you know, the skills of the people inhouse." [Kabir, PM]

Critical reflection appears to have enabled students to gain the skill of life-long learning. According to Claude, PM *"allowed me to use critical reflection, to maximise learning and have it as a tool for future learning."* Logan (SIC) mentioned that he experienced the service component *"broadening their life experience, life-long learning, and development of their interpersonal skills."*

It appears the courses did stimulate the development of certain **reflection** capabilities. Some PM students started to become more aware of themselves and their thought processes.

"I never considered the way that I thought things through." [Kungawo, PM]

Many PM students improved their **interpersonal communication and listening skills** by learning how to negotiate with sponsors, present, and communicate with people from different backgrounds as well as *"to manage the imperfection of communication"* (Iminathi, PM). A recurring theme among SIC students was the importance of listening to members of the community when determining how they may satisfy the community's needs without imposing themselves onto the community. Many SIC students and few PM students appear to have gained **empathy** and compassion.

*“I could better understand the students’ perspectives and therefore relate and empathize with them better.”
[Oliver, SIC]*

PM students reflected on the development of **teamwork** capabilities. Marissa (PM) learned the importance of **trust** and **sharing responsibilities** but also expressed a need for more opportunities to learn trust- and team-building techniques. PM students reflected in their essays on learning about how teams can become more leaderful through self-leadership. They also gained a new understanding of what a **leader** is.

“... one that makes everyone else feel like they are the important ones. Where I create an opportunity for others to become leaders too” [Minathi, PM]

CIVIC-MINDEDNESS

The data were also analyzed using Bringle and Steinberg’s (2010) framework for a civic-minded graduate. Themes were based on the skills, knowledge areas, dispositions, and intentions, in the framework. Major themes will now be reviewed.

Students in both courses appear to exhibit skills relating to **diversity** and the **interaction** competence. It appears as if the IS department promotes diversity. SIC students highlighted the importance of not stereotyping, valuing different perspectives, and reconsidering their approach to community service.

“I will find people in the working world that may not necessarily agree with my view due to the different backgrounds that we come from. That does not mean that any of our views are wrong, but what is important is the way that we interact with each other.” [Thandi, SIC]

“I think these skills will enable me to be a better person around people of a different race, color, and ethnicity.” [Amo, SIC]

Several SIC students and a few PM students appear to have become **social trustees of knowledge** as they have expressed the need to share and use their knowledge to benefit society.

“We are trained to make things better.” [Chivaughn, PM]

“As I said you can create a product or service to benefit the world, but how do you know the problem the world face if you don’t know how people are suffering.” [Lesedi, SIC]

ACTIVE CITIZENSHIP

One of the objectives of the study was to determine whether service-learning has implications for students becoming active citizens. Almost none of the interviewed students exhibited active citizenship. A PM student continued to engage with his community partner after the course ended but this was only for a brief period. One SIC student continued with community engagement but at a different organization. It should be acknowledged that the 2019-2020 pandemic has presented challenges for experiential learning and made it difficult for students to engage with communities (Campbell et al., 2021; Kodancha et al., 2020). It was because of these challenges that the SIC course was cancelled in 2020.

“I think there needs to be careful thinking about what is going to be the setup in terms of the teaching and learning [for 2021]. A lot depends on whether we have a vaccine or not... the risk is what are the partners doing to ensure the safety of their learners and the safety of the volunteers... I think safety here trumps everything. So maybe there’s going to be ways of doing things virtually but you know the reality is that it’s hard. People don’t have connection or PC.” [SIC CC]

Regardless of the pandemic’s impact on experiential learning, there is other supporting evidence for students not gaining active citizenship. Time is a concern, especially in the PM course which only runs for a semester.

“I don’t think we have enough resources in the course or enough space. By resources, I mean time and time to do that - to prepare them for that deeper understanding of what it means to work in a community in a collaborative way.”

Despite SIC course running for two semesters, it is still observed that students do not continue working at the same organization as they do not develop strong relationships – only at a “*professional level*” as mentioned by Karabo (SIC).

Getting commitment from students remains a challenge as some students prioritize other course work over community engagement. This was highlighted by all the staff members. The PM CC tries to have two teams work on the same problem so that if one of them are unable to deliver, there is still a chance that the other team might satisfy the needs of the community.

DISCUSSION

The findings regarding the implications that service-learning may have for students developing skills, gaining civic values, and actively participating in efforts to drive social change, will now be discussed while referencing existing literature.

SKILL-SET DEVELOPMENT

The findings provide supporting evidence for both courses having implications for academic learning and assisting students in the development of soft skills. This is consistent with Salam et al.’s (2017) finding that service-learning supports **academic learning**. Critical reflection appears to support academic learning as well as foster life-long learning. It was found that class discussions may support peer-learning. This would be consistent with Battistoni’s (1997) recommendation of supplementing traditional pedagogies with peer-learning by means of class discussions. It does appear as if teamwork and/or team discussions may also support peer learning to a certain extent.

It was observed that team projects allowed students to develop **teamwork** capabilities such as constructively resolving conflict, sharing responsibilities, and understanding team development, team dynamics, and the importance of trust. This finding supports Hwang’s (2018) argument that teamwork needs to be included in IS courses so that students can learn to work effectively with others. Lynch (2003) also stresses the importance of IS educators focusing on the development of collaborative skills when preparing students for the workplace and its volatile nature. Like in Falk’s (2012) study, it was observed that students were able to communicate team-related matters using the more correct terminology after engaging with readings that focus on team dynamics. From the findings, it does not appear as if students may develop **leadership** when working in a team. It is also possible that community engagement courses such as SIC, may have implications for leadership. One of the SIC students pointed out that to be a good leader, one needs to be aware of contemporary social issues. This might be the case as modern business leaders need to address economical, environmental, and social challenges, as well as promote the ideals of corporate social responsibility (Gorski, 2017). In sum, there is some evidence that service-learning may have implications for civic-responsibility-based leadership (Huda et al., 2018).

These findings are consistent with the research done by Saulnier (2005) and acts as supporting evidence to the belief that service-learning may be an effective pedagogy in IS (Lazar & Lidtke, 2002) as it “improve[s] the achievement of learning objectives” (Andrews, 2007, p. 23).

CIVIC-MINDEDNESS

It was observed that the course content and duration may affect the extent to which students become civic-minded. For example, given the fact that PM students only have a semester to work on a project and to learn project management practices, there is not enough time for educators to teach students on how to engage with the community as well. In contrast, it was found that the SIC course

has strong implications for **social awareness and responsibility** given that the readings, discussions, and activities focused mostly on community engagement and contemporary social issues. Several SIC students recognized their role in developing systems that either address social issues or ensuring that the systems that develop do not perpetuate social injustices. There was also one PM student who viewed her role in IS as “making things better.” There was also some contradictory evidence where a few SIC students were unable to make sense of how the course relates to IS. Overall, the findings act as supporting evidence for Lazar and Lidtke’s (2002) argument that “students can develop a sense of civic responsibility, by contributing their skills to their communities” (p. 1).

Both courses have implications for students developing **interpersonal communication and listening skills** as well as the skill of **consensus-building**. There is supporting evidence that students started to consider different perspectives as well as form relationships with various stakeholders including their peers and members of different communities. However, it appears that relationships with sponsors or community members are not long-term. This is consistent with Mitchell’s (2008) finding that strong, authentic relationships may only originate from critical forms of service-learning.

ACTIVE CITIZENSHIP

Neither of the two courses appears to have had implications for active citizenship. The literature explains that service-learning may only have implications for active citizenship if it is critical and involves transformational efforts to promote social justice and long-lasting change (Butin, 2015). It requires commitment and long-lasting partnership (Butin, 2015). Commitment was a major challenge as indicated by both course convenors and the program manager at the COU. However, it must be highlighted that community engagement has been brief in both courses. A student researcher that is busy with their masters or PhD may have more time available to engage with the community and to develop stronger relationships over a longer period. This can also be seen from Lorini et al.’s (2019) ICT4D study where the case was a co-owned project in which a wireless mesh network was created for content sharing.

The 2019-2020 pandemic has also presented challenges for community engagement as non-profit organizations may lack the needed resources to support social distancing. This challenge has been highlighted by several authors in recent studies (Campbell et al., 2021; Kodancha et al., 2020). However, one may argue that the pandemic has also presented opportunities for students to become more flexible and creative in their service delivery (Campbell et al., 2021, p. 36). For example, students can start food drives for their community. Service-learning project may be redesigned to meet the needs of more accessible populations (Kodancha et al., 2020). Remote tutoring might then be an option with free learning management systems (LMSs) such as Google Classroom and Moodle. Vasanth and Sumanthi (2020) conducted a comparative study on the two LMSs. Interesting points that were highlighted by the authors include the fact that technical support remains limited, Google Classroom requires students to have Gmail accounts, Moodle may not be user-friendly for beginners and contains ads which may be distracting. Regardless of the number of available options, the mental health of students remains a concern as they may feel helpless and struggle to manage their time when working on service-learning projects that are likely to be challenging during these times of uncertainty (Kodancha et al., 2020).

LIMITATIONS

Due to time constraints, long-term implications were not studied. The study is limited to self-reported behavior. Hence, there is the risk of students altering their responses and reflections either in the presence of the researcher or to meet assignment criteria. Given that the study was conducted during the coronavirus pandemic, interviews were conducted in a virtual environment. This prevented the researcher from assessing body language and facial expressions in some cases. Human language is inherently ambiguous (Atieno, 2009). Moreover, English was not the first language of all participants. Some students are not natural writers. Both factors limited some students in their ability

to express themselves and presented the risk of data being incorrectly interpreted. Member-checking has been done to mitigate this risk. Given that qualitative studies are time-intensive, the sample size has been limited to students in the 2019 academic year. As context plays an important role in case research, findings are hard to transfer to other settings. It is also difficult to derive cause-effect relationships in case research (Queirós et al., 2017).

CONCLUSION

IS education literature stresses the need for a new teaching approach that provides IS graduates with learning outcomes such as the development of both technical and soft skills as well as a moral responsibility. This has raised the question on what is the role of service-learning in IS education in a developing country context?

In response to this question, a qualitative exploratory study was conducted to closely examine two IS courses at a South African university – a third-year PM course and the honors SIC course. Course evaluations and reflective essays were collected. Semi-structured one-on-one interviews were conducted with students and staff members to gain further insight into their course experiences. A thematic analysis was performed where themes were derived from both existing literature and the data that was collected.

The findings showed that in the context of a developing country, the role of service-learning includes supporting the development of IS soft skills, shaping students' civic values or allowing students to become civic-minded graduates, and assisting IS students in understanding their future role in society as IS professionals. The specific implications that an IS service-learning course may for students depend on various factors such as scope and how the course has been designed, implemented, and ran.

Based on the literature and findings, it is recommended that IS educators carefully design their courses to support desired learning outcomes. This involves the selection of readings, activities, and projects. It is encouraged that educators incorporate teamwork and even include team-related readings to support students' development of teamwork capabilities. It is important that projects are carefully screened as they may affect students' attitude towards the course. Reflection is important and support the development of high-quality learning outcomes. Educators may use Eyler's (2001) reflection map to help structure reflection activities throughout the course.

Going forward, it is recommended that IS education researchers conduct longitudinal studies in which data is collected by means of observation. It might be interesting to see what the role of service-learning is in IS education at a masters and/or PhD level as well in the first two years of an IS undergraduate degree program. It is also recommended that research conduct explanatory studies that focus on mediating factors and the relationships that exist between the different components of service-learning and the implications that the pedagogy may have for IS students.

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REFERENCES

- Anderson, D. L. (2017). Improving information technology curriculum learning outcomes. *Informing Science: The International Journal of an Emerging Transdiscipline*, 20, 119-131. <https://doi.org/10.28945/3690>
- Andrews, C. P. (2007). Service learning: Applications and research in business. *Journal of Education for Business*, 83(1), 19-26. <https://doi.org/10.3200/JOEB.83.1.19-26>
- Asghar, M., & Rowe, N. (2017). Reciprocity and critical reflection as the key to social justice in service learning: A case study. *Innovations in Education and Teaching International*, 54(2), 117-125. <https://doi.org/10.1080/14703297.2016.1273788>

- Atieno, O. P. (2009). An analysis of the strengths and limitation of qualitative and quantitative research paradigms. *Problems of Education in the 21st Century*, 13, 13-18. https://scientiasocialis.lt/pec/files/pdf/Atieno_Vol.13.pdf
- Battistoni, R. M. (1997). Service learning and democratic citizenship. *Theory into Practice*, 36(3), 150-156. <https://doi.org/10.1080/00405849709543761>
- Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101. <https://doi.org/10.1191/1478088706qp0630a>
- Bringle, R. G., & Hatcher, J. A. (1995). A service-learning curriculum for faculty. *Michigan Journal of Community Service Learning*, 2(1), 112-122. <http://hdl.handle.net/1805/4591>
- Bringle, R. G., & Steinberg, K. (2010). Educating for informed community involvement. *American Journal of Community Psychology*, 46(3), 428-441. <https://doi.org/10.1007/s10464-010-9340-y>
- Bringle, R. G., Studer, M., Wilson, J., Clayton, P. H., & Steinberg, K. S. (2011). Designing programs with a purpose: To promote civic engagement for life. *Journal of Academic Ethics*, 9(2), 149-164. <https://doi.org/10.1007/s10805-011-9135-2>
- Britt, L. L. (2012). Why we use service-learning: A report outlining a typology of three approaches to this form of communication pedagogy. *Communication Education*, 61(1), 80-88. <https://doi.org/10.1080/03634523.2011.632017>
- Butin, D. W. (2003). Of what use is it? Multiple conceptualizations of service learning within education. *Teachers College Record*, 105(9), 1674-1692. <https://doi.org/10.1046/j.1467-9620.2003.00305.x>
- Butin, D. W. (2015). Dreaming of justice: Critical service-learning and the need to wake up. *Theory into Practice*, 54(1), 5-10. <https://doi.org/10.1080/00405841.2015.977646>
- Çakmaklı, D. (2015). Active citizenship in Turkey: Learning citizenship in civil society organizations. *Citizenship Studies*, 19(3-4), 421-435. <https://doi.org/10.1080/13621025.2015.1006174>
- Carver, R. L. (1997). Theoretical underpinnings of service learning. *Theory into Practice*, 36(3), 143-149. <https://doi.org/10.1080/00405849709543760>
- Campbell, M., Cazanave, C., Caines, K. L., Papas, M. P., Hicks, G., Whittington, K., Scott, C., & Cobb, B. (2021). Lemonade from lemons: Converting the pandemic into an opportunity to serve. *Interdisciplinary Insights. The Journal of Saint Leo University's College of Education and Social Services*, 3(1), 34-58. <https://www.interdisciplinaryinsights.org/article/18946.pdf>
- Cascio, W. F., & Montealegre, R. (2016). How technology is changing work and organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, 3(1), 349-375. <https://doi.org/10.1146/annurev-orgpsych-041015-062352>
- Connolly, R. W. (2012, February). Is there service in computing service learning? *SIGCE'12: Proceedings of the 43rd ACM Technical Symposium on Computer Science Education* (pp. 337-342). Association for Computing Machinery. <https://doi.org/10.1145/2157136.2157238>
- Dalmida, S. G., Amerson, R., Foster, J., McWhinney-Dehaney, L., Magowe, M., Nicholas, P. K., Pehrson, K., & Leffers, J. (2016). Volunteer service and service learning: Opportunities, partnerships, and United Nations Millennium Development Goals. *Journal of Nursing Scholarship*, 48(5), 517-526. <https://doi.org/10.1111/jnu.12226>
- Department of Education, South Africa (2007). The higher education qualifications framework. *Government Gazette*. <https://www.saqa.org.za/docs/pol/2007/not0928.pdf>
- Dwivedi, Y. K., Wastell, D., Laumer, S., Henriksen, H. Z., Myers, M. D., Bunker, D., Elbanna, A., Ravishankar, M. N., & Srivastava, S. C. (2014). Research on information systems failures and successes: Status update and future directions. *Information Systems Frontiers*, 17(1), 143-157. <https://doi.org/10.1007/s10796-014-9500-y>
- Eyler, J. (2001). Creating your reflection map. *New Directions for Higher Education*, 2001(114), 35-43. <https://doi.org/10.1002/he.11.abs>

- Eyler, J. (2002). Reflection: Linking service and learning-linking students and communities. *Journal of Social Issues*, 58(3), 517-534. <https://doi.org/10.1111/1540-4560.00274>
- Falk, A. (2012). Enhancing the team experience in service learning courses. *Journal for Civic Commitment*, 18, 1-16. https://scholarworks.merrimack.edu/soe_facpub/1
- Fink, L. D. (2003). A self-directed guide to designing courses for significant learning. *University of Oklahoma*, 27(11). <http://www.bu.edu/sph/files/2011/06/selfdirected1.pdf>
- Fleischmann, K. R., Robbins, R. W., Katz, J. M., & Wallace, W. A. (2011). Information ethics education for a multicultural world. *Journal of Information Systems Education*, 22(3), 191–201. <https://aisel.aisnet.org/jise/vol22/iss3/2>
- Furco, A. (1996). Is service-learning really better than community service? A study of high school service program outcomes. In A. Furco & S. H. Billing (Eds.), *Service-learning: The essence of pedagogy* (pp. 23-50). Information Age Publishing Inc. <https://digitalcommons.unomaha.edu/slceslgen/154>
- Fusch, P. I., & Ness, L. R. (2015). Are we there yet? Data saturation in qualitative research. *The Qualitative Report*, 20(9), 1408-1416. <https://doi.org/10.46743/2160-3715/2015.2281>
- Garibay, J. C. (2018). Beyond traditional measures of STEM success: Long-term predictors of social agency and conducting research for social change. *Research in Higher Education*, 59(3), 349-381. <https://doi.org/10.1007/s11162-017-9470-2>
- Gorski, H. (2017). Leadership and corporate social responsibility. *International Conference Knowledge-Based Organization*, 23(1), 372-377. <https://doi.org/10.1515/kbo-2017-0061>
- Grain, K. M., & Lund, D. E. (2016). The social justice turn: Cultivating “critical hope” in an age of despair. *Michigan Journal of Community Service Learning*, 23(1), 45-59. <https://doi.org/10.3998/mjcsloa.3239521.0023.104>
- Grant, C. T., & Grant, K. A. (2010, June). Experiences in teaching ethics to ICT students. *Proceedings of the 2010 Informing Science and Information Technology Education Conference, Cassino, Italy*, 588-595. <https://doi.org/10.28945/1276>
- Gruzdev, M. V., Kuznetsova, I. V., Tarkhanova, I. Y., & Kazakova, E. I. (2018). University graduates’ soft skills: The employers’ opinion. *European Journal of Contemporary Education*, 7(4), 690-698. <https://doi.org/10.13187/ejced.2018.4.690>
- Halberstadt, J., Timm, J. M., Kraus, S., & Gundolf, K. (2019). Skills and knowledge management in higher education: How service learning can contribute to social entrepreneurial competence development. *Journal of Knowledge Management*, 23(10), 1925-1948. <https://doi.org/10.1108/JKM-12-2018-0744>
- Harris, R. W. (2016). How ICT4D research fails the poor. *Information Technology for Development*, 22(1), 177-192. <https://doi.org/10.1080/02681102.2015.1018115>
- Heeks, R. (2002). Information systems and developing countries: Failure, success, and local improvisations. *Information Society*, 18(2), 101-112. <https://doi.org/10.1080/01972240290075039>
- Heeks, R. (2008). ICT4D 2.0: The next phase of applying ICT for international development. *Computer*, 41(6), 26-33. <https://doi.org/10.1109/MC.2008.192>
- Hoskins, B., Jesinghaus, J., Mascherini, M., Munda, G., Nardo, M., Saisana, M., VanNijlen, D., Vidoni, D., & Villalba, E. (2006). *Measuring active citizenship in Europe (CRELL Research Paper 4)*. European Communities. https://www.labsus.org/wp-content/uploads/images/M_images/MeasuringActiveCitizenship.pdf
- Hoskins, B. L., & Mascherini, M. (2009). Measuring active citizenship through the development of a composite indicator. *Social Indicators Research*, 90(3), 459-488. <https://doi.org/10.1007/s11205-008-9271-2>
- Hoxmeier, J., & Lenk, M. M. (2003). Service-learning in information systems courses: Community projects that make a difference. *Journal of Information Systems Education*, 14(1), 10. <https://aisel.aisnet.org/jise/vol14/iss1/10>
- Huda, M., Teh, K. S. M., Muhamad, N. H. N., & Nasir, B. M. (2018). Transmitting leadership based civic responsibility: Insights from service learning. *International Journal of Ethics and Systems*, 34(1), 20-31. <https://doi.org/10.1108/IJOES-05-2017-0079>

- Hwang, M. I. (2018). Relationship between teamwork and team performance: Experiences from an ERPsim competition. *Journal of Information Systems Education*, 29(3), 157-168. <http://jise.org/Volume29/n3/JISEv29n3p157.html>
- Karanja, E., Grant, D. M., Freeman, S., & Anyiwo, D. (2016). Entry level systems analysts: What does the industry want? *Informing Science: The International Journal of an Emerging Transdiscipline*, 19, 141-160. <https://doi.org/10.28945/3517>
- Khene, C. (2015). Curriculum development of an ICT4D module in the South African context. *Issues in Informing Science and Information Technology*, 12, 111-139. <https://doi.org/10.28945/2181>
- Klimova, A., Rondeau, E., Andersson, K., Porras, J., Rybin, A., & Zaslavsky, A. (2016). An international Master's program in Green ICT as a contribution to sustainable development. *Journal of Cleaner Production*, 135, 223-239. <https://doi.org/10.1016/j.jclepro.2016.06.032>
- Kodancha, P., Sajjani, K. S., Raut, A., & Baboo, S. (2020) Service-learning in Indian higher education: Experiences of adaptation to the COVID-19 pandemic. *Journal of Service-Learning in Higher Education*, 11(2). <https://journals.sfu.ca/jslhc/index.php/jslhc/article/view/309>
- Lazar, J., & Lidtke, D. (2002). Service-learning partnerships in the information systems curriculum. In J. K. Lazar (Ed.), *Managing IT/community partnerships in the 21st century* (pp. 1-16). IGI Global. <https://doi.org/10.4018/978-1-930708-33-4.ch001>
- Lee, R. L. (2012). Experience is a good teacher: Integrating service and learning in information systems education. *Journal of Information Systems Education*, 23(2), 165-176. <http://jise.org/Vol-ume23/n2/JISEv23n2p165.html>
- Lorini, M. R., Densmore, M., Johnson, D., Hadzic, S., Mthoko, H., Manuel, G., Waries, M., & van Zyl, A. (2019). Localize-it: Co-designing a community-owned platform. In K. Krauss, M. Turpin, & F. Naude (Eds.), *Locally relevant ICT research* (pp. 1-15). Springer Nature. https://doi.org/10.1007/978-3-030-11235-6_16
- Lopez, D., Sanchez, F., Franquesa, D., & Cabré, J. (2015, October). Participatory learning process through ICT4D projects. In G. R. Alves & M. C. Felgueiras (Eds.), *TEEM'15. Proceedings of the 3rd International Conference on Technological Ecosystems for Enhancing Multiculturality* (pp. 553-557). The Association of Computing Machinery. <https://doi.org/10.1145/2808580.2808664>
- Lynch, K. (2003). Collaborative working skills for the beginning IS professionals. *Issues in Informing Science and Information Technology*, 417-429. <https://doi.org/10.28945/749>
- Martin, T. R., Lecrom, J., & Lassiter, J. W. (2017). Hearts on our sleeves: Emotions experienced by service-learning faculty. *International Journal of Research on Service-Learning and Community Engagement*, 5(1), 41-56. <https://journals.sfu.ca/iarslce/index.php/journal/article/download/273/190>
- Marullo, S. (1998). Bringing home diversity: A service-learning approach to teaching race and ethnic relations. *Teaching Sociology*, 26(4), 259-275. <https://doi.org/10.2307/1318767>
- McLeod, A. K. (2017). Service learning and community engagement for English classes. *English Teaching Forum*, 55(3), 20-27. <https://eric.ed.gov/?id=EJ1156480>
- Mezirow, J. (1997). Transformative learning: Theory to practice. *New Directions for Adult and Continuous Education*, 74, 5-12. <https://doi.org/10.1002/ace.7401>
- Mitchell, T. D. (2008). Traditional vs. critical service-learning: Engaging the literature to differentiate two models. *Michigan Journal of Community Service Learning*, 14(2), 50-65. <https://eric.ed.gov/?id=EJ831374>
- Molderez, I., & Fonseca, E. (2018). The efficacy of real-world experiences and service learning for fostering competences for sustainable development in higher education. *Journal of Cleaner Production*, 172, 4397-4410. <https://doi.org/10.1016/j.jclepro.2017.04.062>
- Moody, J. (2002, June). Teaching effective listening skills to information systems majors. *Proceedings of the 2002 Informing Science and IT Education Conference*, Cork, Ireland, 1114-1116. <https://doi.org/10.28945/2541>
- Mooney, L. A., & Edwards, B. (2001). Experiential learning in sociology: Service learning and other community-based learning initiatives. *Teaching Sociology*, 29(2), 181-194. <https://doi.org/10.2307/1318716>

- Morton, K. (1995). The irony of service: Charity, project and social change in service-learning. *Michigan Journal of Community Service Learning*, 2(1), 19-32. <https://quod.lib.umich.edu/m/mjcs/3239521.0002.102/1>
- Mwalemba, G. (2019). Information systems education for development: A typology of ICT4D pedagogies. In P. Nielsen & H. C. Kimaro (Eds.), *Proceedings of the 15th IFIP WG 9.4 International Conference on Social Implications of Computers in Developing Countries* (pp. 337-348). Springer. https://doi.org/10.1007/978-3-030-19115-3_28
- O'Lawrence, H. (2019). The benefits and challenges of living, teaching and working in today's diverse world. *Proceedings of the 2019 Informing Science and Information Technology Education Conference, Jerusalem, Israel*, 495-499. <https://doi.org/10.28945/4355>
- Phukan, S. (2002, June). IT ethics in the internet age: New dimensions. *Proceedings of the 2002 Informing Science and Information Technology Education Conference, Cork, Ireland*, 1249-1257. <https://doi.org/10.28945/2556>
- Pless, N. M., Maak, T., & Stahl, G. K. (2012). Promoting corporate social responsibility and sustainable development through management development: What can be learned from international service learning programs? *Human Resource Management*, 51(6), 873-903. <https://doi.org/10.1002/hrm.21506>
- Pratt, J. A., Keys, A., & Wirkus, T. (2014). Preparing information systems graduates for a complex society: Aligning IS curricula with liberal education learning outcomes. *Journal of Information Systems Education*, 25(1), 35-44. <https://aisel.aisnet.org/jise/vol25/iss1/4>
- Pratt, Y. P., & Danyluk, P. J. (2017). Learning what schooling left out: Making an indigenous case for critical service-learning and reconciliatory pedagogy within teacher education. *Canadian Journal of Education / Revue canadienne de l'éducation*, 40(1), 1-29. <https://www.jstor.org/stable/90002335>
- Queirós, A., Faria, D., & Almeida, F. (2017). Strengths and limitations of qualitative and quantitative research methods. *European Journal of Education Studies*, 3(9), 369-387. <https://doi.org/10.5281/zenodo.887089>
- Qureshi, S. (2015). Are we making a better world with Information and Communication Technology for Development (ICT4D) research? Findings from the field and theory building. *Information Technology for Development*, 21(4), pp. 511-522. <https://doi.org/10.1080/02681102.2015.1080428>
- Said, H., Ahmad, I, Hassan, Z, & Awang, Z. (2015). Service learning as critical pedagogy: Implications for student community awareness and citizenship development. *Mediterranean Journal of Social Sciences*, 6(2), 471-478. <https://doi.org/10.5901/mjss.2015.v6n2p471>
- Salam, M., Awang Iskandar, D., & Abang Ibrahim, D. (2017). Service learning support for academic learning and skills development. *Journal of Telecommunication, Electronic and Computer Engineering (JTEC)*, 9, 111-117. <https://journal.utem.edu.my/index.php/jtec/article/view/2713>
- Sandri, O. J. (2013). Exploring the role and value of creativity in education for sustainability. *Environmental Education Research*, 19(6), 765-778. <https://doi.org/10.1080/13504622.2012.749978>
- Santiago-Ortiz, A. (2019). From critical to decolonizing service-learning: Limits and possibilities of social justice-based approaches to community service-learning. *Michigan Journal of Community Service Learning*, 25(1), 43-54. <https://doi.org/10.3998/mjcsloa.3239521.0025.104>
- Saulnier, B. M. (2005). Service learning in computer information systems: "Significant" learning for tomorrow's computer professionals. *Information Systems Education Journal*, 3(10), 1-12. <http://isedj.org/3/10/>
- Schelbe, L., Petracchi, H. E., & Weaver, A. (2014). Benefits and challenges of service: Learning in baccalaureate social work programs. *Journal of Teaching in Social Work*, 34(5), 480-495. <https://doi.org/10.1080/08841233.2014.954689>
- Scott, E., McGibbon, C., & Mwalemba, G. (2012, June). Attempts to embed green values in the information systems curriculum: A case study in a South African setting. *Proceedings of the 20th European Conference on Information Systems*, Paper 128. <https://aisel.aisnet.org/ecis2012/128>
- Shrivastava, P. (2010). Pedagogy of passion for sustainability. *Academy of Management Learning & Education*, 9(3), 443-455. <https://doi.org/10.5465/amle.9.3.zqr443>

- Snell, R. S., Chan, M. Y. L., Ma, C. H. K., & Chan, C. K. M. (2015). A road map for empowering undergraduates to practice service leadership through service-learning in teams. *Journal of Management Education*, 39(3), 372-399. <https://doi.org/10.1177/1052562914545631>
- Taylor, E. (2016). Investigating the perception of stakeholders on soft skills development of students: Evidence from South Africa. *Interdisciplinary Journal of e-Skills and Life Long Learning*, 12, 1-18. <https://doi.org/10.28945/3412>
- Topi, H. (2019). Reflections on the current state and future of information systems education. *Journal of Information Systems Education*, 30(1), 1-9. <http://jise.org/Volume30/n1/JISEv30n1p1.html>
- Tryon, E., Stoecker, R., Martin, A., Seblonka, K., Hilgendorf, A., & Nellis, M. (2008). The challenge of short-term service-learning. *Michigan Journal of Community Service Learning*, 14(2), 16-26. <https://eric.ed.gov/?id=EJ831352>
- Vasanth, S., & Sumathi, C. S. (2020). Learning management systems through Moodle and Google classroom for education. *Advances in Research*, 21(10), 32-37. <https://doi.org/10.9734/air/2020/v21i1030249>
- Whitney, K. M., & Daniels, C. B. (2013). The root cause of failure in complex IT projects: Complexity itself. *Procedia Computer Science*, 20, 325-330. <https://doi.org/10.1016/j.procs.2013.09.280>
- Winston, F. (2015). Reflections upon community engagement: Service-learning and its effect on political participation after college. *Journal of Higher Education Outreach and Engagement*, 19(1), 79-104. <https://eric.ed.gov/?id=EJ1061880>
- Yin, R. K. (2000). Case study evaluations: A decade of progress? In D. L. Stufflebeam, George F. Madaus, T. Kellaghan (Eds.), *Evaluation models* (pp. 185-193). Springer. https://doi.org/10.1007/0-306-47559-6_11

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