

Scope of Service-Learning in Accomplishing Objectives of National Education Policy 2020, India - A Conceptual Analysis

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Abstract— National Education Policy (NEP) 2020 is the latest evolution of the Indian Education System built on the foundational pillars of Access, Equity, Quality, Affordability and Accountability. The NEP focuses on providing quality education to all students, irrespective of their socio-economic background or place of residence, thus cultivating the youths of tomorrow into moral and civil citizens leading to the development of the nation. The NEP also encourages education to be Holistic, Integrated, Enjoyable and Engaging, which can be achieved by introducing and integrating new pedagogies. Service-learning is one such pedagogy that aims at being experiential, inquiry-driven, and meaningful. Service-learning is popular at enabling students to apply classroom learnings into the real-world and gain hands-on experience, because of which, it is widely integrated into Higher Education Institutions (HEIs), especially at the undergraduate level, around the world. Given the outcome of implementing NEP by 2030, it is reasonable to envision HEIs of India, primarily engineering, to adopt and integrate service-learning experiences into their curriculum as well. This paper is an attempt to showcase the learning outcomes and scope of service-learning as a pedagogy to accomplish the objectives of NEP 2020.

Keywords—Indian Engineering Education; National Education Policy 2020; Service Learning

JEET Category— Practice

I. INTRODUCTION

The National Education Policy (NEP) 2020 is the first step towards modernizing the Indian Education System and was approved on July 29, 2020 by the Union Cabinet of India. The NEP lays the action plan for Indian Education System to be aligned with the 2030 Agenda for Sustainable Development and aims to revolutionize India into a cornerstone and keeper of world's knowledge wealth.

Service has always been intrinsic to Indian tradition and culture. National Service Scheme (NSS), Unnat Bharat Abhiyan (UBA), and Rural Technology Action Group (RuTAG), among others, are modern examples of such civic and social engagements. Research-based pedagogies can connect the ethic of service with NEP approaches thus

enhancing and expanding the impact on students and our communities. One such pedagogy is Service-Learning. The concept of service-learning has been around for about a century, however, has become popular in the 21st century. Lima & Oakes (2014), in their guidebook for service-learning in engineering, identified five components of service learning: 1. Service, 2. Academic content, 3. Partnership and reciprocity, 4. Mutual Learning and 5. Reflection.

Kandakatla et al. (2022) conceptually explored the viability of using Service-learning as a pedagogy to attain all the graduate attributes as listed by the National Board of Accreditation (NBA). The NEP incentivizes such pedagogy to be implemented by educational institutions by encouraging holistic approach as a core part of the curriculum content development. With the call towards updating the nation's education curriculum as per the NEP, it is also important to understand the learning outcomes students would attain as a result of service-learning experiences and how it can be used to accomplish the objectives of NEP. This paper is an attempt to develop a conceptual analysis of the learning outcomes that could be achieved through service-learning experiences and understanding the scope of service-learning in accomplishing the fundamental principles of NEP 2020.

II. LITERATURE REVIEW

A. National Education Policy 2020, India

The National Education Policy (NEP) 2020 is the third iteration and first education policy of this century that is aiming for India to "have an education system by 2040, that is second to none, with equitable access to the highest quality education for all learner, regardless of their social or economic background". Aithal & Aithal (2020) in their paper critiqued the NEP by presenting the important aspects of NEP and compared them to the existing education system. The NEP focuses on the primary and direct stakeholders of education – students, teachers, administrators, private and public institutions, state, and central governments. Essentially, NEP is the blueprint to make India the next knowledge keeper and leader of the world. The NEP was designed in alignment with the 2030 Agenda of Sustainable Development, as known as the Sustainable Development Goal 4 (SDG4), while also perfecting the incorporation of India's heritage and value systems. As per the

NEP, the teacher is at the center and emphasis is placed on recognizing, identifying, and fostering the unique capabilities of each learner. It also recognizes that education must develop both the 'foundational capacities' of literacy and numeracy and 'higher-order' cognitive capacities, such as critical thinking and problem solving - but also social, ethical, and emotional capacities and dispositions, not only cognitive capacities (MyGov, 2020).

B. Service-learning in Engineering

The concept of service-learning can be traced back to John Dewey (1938), the proponent of experiential hands-on learning. This learning theory was built upon by Kolb (1984) as a four-stage learning cycle – Kolb's Experiential Learning Theory. Community Engagement is also a common term and most institutions familiar with. Community Engagement is the medium to involve students with the members of the community to design, develop and implement projects that benefit the community. Much of the early work was centered within the social sciences and humanities but more recently it has gained traction within the STEM fields and especially within engineering. Reflection is a core tenant of service-learning and symbolizes the hyphen between service and learning (Eyler, 2001).

Hatcher & Bringle (1997) defined service-learning as - "Service-learning is a credit-bearing educational experience in which students participate in an organized service activity that meets identified community needs and reflects on the service activity in such a way as to gain further understanding of the course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility."

Eyler and Giles (1999) defined it as - "a form of experiential education where learning occurs through a cycle of action and reflection as students ... seek to achieve real objectives for the community and deeper understanding and skills for themselves. In the process, students link personal and social development with academic and cognitive development experience enhances understanding; understanding leads to more effective action."

Service-learning is traditionally integrated with a course or can be implemented as a standalone project-based program. Service-learning balances both the academic content (student learning) and benefiting the community partner (community involvement). There are three major stakeholders – the students, the faculty, and the community partners. Each stakeholder is an equal and important piece. Students get to apply their technical learning gained from classroom into the real-world with real consequences through the projects. Students involved in service-learning based courses or programs acquire a variety of essential engineering skills such as problem-solving, analytical decision-making, teamwork, and project management to name a few. Students also acquire professional skills such as communicating with others, understanding societal requirements, and developing ethical behavior. Service-learning develops character virtues and interpersonal habits such as respect, responsibility, empathy, cooperation, citizenship, initiative, and persistence (Billig, 2000).

Service-learning is in its adolescence in India and is relatively new as a formal pedagogy, however, service as a practice has been integral to India since ancient times. Providing service and being one with the community has been considered as a high value responsibility of every Indian. Although service has been practiced by Indians and institutions in India, it has been with the lens of "extended education" and not part of the mainstream curriculum. There have been multiple government initiatives, Non-Government Organizations that promote the motto of service and have been encouraging influences on service-learning. The National Service Scheme (NSS) is one such initiative that is closely linked with educational institutions. NSS promotes the value system of caring for others first than self and has been practiced in the Indian schools and colleges to exhibit leadership qualities and helping nature to the society. NSS, however, is inclined more towards service, and learning is considered as an optional outcome as it is not measured or incentivized with academic credits. As an agriculturally based country, most of the community engagement was in the rural areas with farmers and students of agricultural institutions. The NEP has included community engagement as a significant focus area along with research and development. This further increases the scope of engineering education institutions in India to become participating institutions with service-learning programs and collaborate on meaningful community projects which can be integrated into the curriculum and make engineering more meaningful.

1) Engineering Projects for Community Service (EPICS) in India

The Engineering Projects for Community Service (EPICS) program was initiated at Purdue University in 1995 to support the need of bridging the gap between engineering undergraduates and community, which was later adopted by multiple higher education institutions across the world (Coyle et al., 1997). The EPICS model of service-learning was introduced to India's National Institutes of Technology (NITs) by IEEE and also to some of its IEEE chapters (Sudhakara Reddy et al., 2018). The EPICS model was integrated into the engineering curriculum with academic credit and the faculty were trained as they were the key player between students and community partners (Oakes et al., 2014). EPICS model uses the engineering design cycle for service-learning, as shown in Figure 1. The EPICS design model is a seven phase model which begins with Project identification, specification development, conceptual design, final design, project delivery, service maintenance, redesign/retire. The unique feature of this model is that each phase is iterative, and students can essentially fall back to square one start over the entire project in unseen circumstances.

EPICS was also adopted by other engineering colleges in India with the support of IUCEE (Indo Universal Collaboration for Engineering Education) (Naik et al., 2020). IUCEE is conceptualized to bring engineering education leaders across the globe together and facilitate engineering institutions in India to collaborate and enhance the quality of engineering education in India specific and globally in general. IUCEE organized several workshops and conferences to promote the EPICS model in India. As a result, some engineering colleges became EPICS members and implemented the model was later incorporated into their curriculum (Irfan & Sammaiah, 2017).

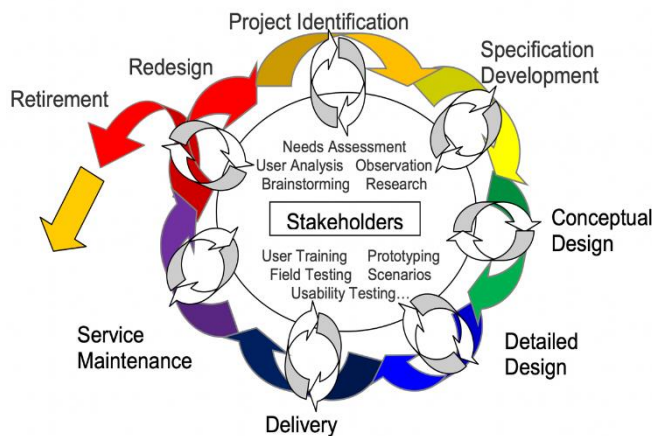


Fig. 1 – EPICS Engineering Design Cycle for Service-Learning Projects
(EPICS Design Cycle)

C. NEP 2020 in the context of Service-learning

The National Education Policy (NEP) 2020 is structured into 4 parts – School Education, Higher Education, Other Key Areas of Focus and Making it Happen, of which, this paper will focus on parts 1,2 and 3 primarily. Table 1 lists the fundamental principles of NEP 2020 and associated sections for better understanding the principles and how they will be addressed and incorporated/implemented. These fundamental principles listed are only in the context of SL. There are also specific sections such as experiential learning in chapter 4 that are dedicated to SL and not necessarily associated with one fundamental principle as such.

TABLE I
FUNDAMENTAL PRINCIPLES OF NEP WITHIN THE CONTEXT OF SERVICE-LEARNING

Fundamental Principles	Sections
Multidisciplinarity and Holistic Education	1.2. 4.1, 4.2, 4.4, 4.37 Towards a More Holistic and Multidisciplinary Education - Chapter 11 Experiential Learning - section in Chapter 4
Emphasis on Conceptual Understanding, Encourage Creative and Critical Thinking	4.5 Optimal Learning Environments and Support for Students - Chapter 12
Ethics, Human and Constitutional Value	1.2, 4.28, 9.1.1, 11.8
Life Skills	2.1 Adult Education and Lifelong Learning - Chapter 21
Formative Assessment	4.34, 4.35 Transforming Assessment for Student Development - section in Chapter 4
Respect for Diversity and Local Context	3.5 Equitable and Inclusive Education : Learning for All - Chapter 6
Respect for Equity and Inclusion	Equity and Inclusion in Higher Education - Chapter 14
Rootedness and Pride in India	4.27, 4.29
Invest in and Encourage Philanthropic Community Participation	3.6, 3.7

III. SERVICE-LEARNING ACCOMPLISHING OBJECTIVES OF NATIONAL EDUCATION POLICY 2020, INDIA

In this section, based on the conceptual understanding of service-learning, we now attempt to explain how such experiences can benefit accomplishing the objectives of NEP 2020.

A. Multidisciplinarity and Holistic Education:

Students as part of service-learning pedagogy approach a need as a team and holistically. The student team considers the entire life cycle of the project and its associated impact on the stakeholders. The student teams are vertically integrated and can be from different disciplines. An indicator of a good quality engineer to be able to approach a problem with multiple perspectives. Having students from different disciplines ensures that all potential solutions are reviewed, and the optimal solution is launched. Discipline specific courses which address the community needs are perceived as academically intellectual and multidiscipline based courses are seen as lightweight in terms of academic rigor. It is important to consider the service experience while meeting the academic requirements (Heffernan, 2001). The NEP is compiled with the view of integrating academics, co-curricular and extracurricular activities into broader learning which brings accountability among the learners. A learner thinking about a single aspect of a product with compartmental skill or knowledge of a discipline, would make the overall product a failure. Service-learning promotes the idea of multidiscipline approach to provide an opportunity to students get big picture of the applications of the respective core concepts that they learn in the academic settings.

B. Emphasis on Conceptual Understanding, Encourage Creative and Critical Thinking:

Students part of service-learning pedagogy, take a deep dive when they are defining the problem statement. Service-learning requires students to design, develop, and deliver real-time products to community partners. This would require the students to analyze prior research and products developed to solve similarly identified community problems. Students need to also interact with the community partners to understand the need of the problem and formulate the problems identified by identifying the user constraints and functional requirements of the solution to be developed. Service-learning provides students with an opportunity to apply knowledge gained through their respective program curriculum to solve ill-structured problems identified in the partner communities. Being part of service-learning projects encourages students to synthesize the knowledge they acquired in the classroom and apply it to community-based problems. Service-learning experiences result in various beliefs, feelings, values, and assumptions. There is a scope that the learners get creative ideas out of repeated reflective thinking around the community need. This might lead to new learnings even though it is limited (Hurd, 2006).

Students after the design and selection of the solution need to be able to use engineering hardware and software tools to develop a working prototype. During the design of potential

solutions, students could be encouraged to make use of advanced modeling and simulation tools to analyze and test their functionality digitally before the development of the physical prototype. Students could also develop different test cases of potential users and predict their usage patterns to improvise the design of the solution. The use of reflections in various stages of the service-learning projects will probe students to critically think and evaluate the role of engineering in society and build their own understanding of the responsibility of engineers towards the betterment of society. Though there are challenges with service-learning in terms of control over the context and stakeholders, it offers an opportunity to critically think about the applications which further develop deeper understanding of the concepts and community problem in a broader way (Campbell & Oswald, 2018)

C. Ethics, Human and Constitutional Values:

Service-learning experiences due to their situation in the community context enable students to examine the professional and ethical responsibilities of their profession. The reflections provided to students at the various stages of the service-learning projects will encourage them to develop their own sense of ethics and further commit to a certain set of norms that would guide their engineering practice. Faculty, during their briefings to service-learning course requirements and frameworks to the students, code of ethics is included in general. Students are required to be empathetic about the community users of the services or products delivered by the students during service-learning experiences. Tricia McClam et al describes the role of service-learning educators to set ethical expectations from the student participants in the service-learning (McClam et al., 2008)

D. Life Skills:

Development of solutions as part of service-learning projects often requires students to possess knowledge and skills beyond what they learned in the classroom. While the application of classroom learning is an essential component of service learning, students also need to build awareness of knowledge from other disciplines that would be required for the successful completion of the projects. The use of guided reflections enables students to critically think and identify the additional knowledge and skills that they need to develop to be able to contribute effectively to the team. The use of reflections throughout the various stages of the service-learning project will improve the metacognitive abilities of students and will contribute to the intellectual development that will enable them to become life-long learners. Jennifer Saylor et al, in their research emphasized that the life skills like teamwork, communication, leadership, conflict resolution and interpersonal management are acquired through service-learning courses (Saylor et al., 2018).

E. Formative Assessment:

Service-Learning as a pedagogy leans on holistic formative assessments as the goal is not evaluate student learning against a standard or benchmark. Every project is unique and there are different team compositions for each project. The key is the balance between the benefit of the community partner and academic learning. Failures are steppingstones for success and penalizing students for a failure goes against the core of service-learning fundamentals. Formative assessment sets path for checking self-learning and regulate the learners themselves for better understanding of the concepts by reflecting on the errors committed and correcting subsequently (Luckritz Marquis, 2021).

F. Respect for Diversity, Equity, Inclusion and Local Context:

Students in service-learning projects will have to also learn to work in diverse teams, be able to communicate effectively, contribute to the project individually and as a group, manage the allocation of tasks and decision-making among all team members. The nature of the community problems will also require students to work in multidisciplinary teams as varied engineering expertise will be needed to develop the solutions. Learning outcomes and the process followed varies in various forms of service-learning courses. But there are several common aspects in the courses. One such common aspect which is frequently discussed as an advantage of service-learning is the values of diversity and inclusion (Bandyopadhyay et al., 2021). Solutions developed by the people who experience directly in the context are more sustainable than those which are imported from other contexts. At the same time, learning from diversified contexts helps in building better alternatives.

G. Rootedness and Pride in India:

The utilization of engineering knowledge and skills in social and community contexts provides students with an opportunity to analyze the role of engineers in the process of community development. Students, through reflection opportunities as part of the service-learning experiences, will be made to directly think and explore the impact of the engineering solutions they developed on the environment. The engineering solutions being designed will be made to meet principles of sustainable development as the products and services developed should not have a negative impact on the partnered communities. Raisuyah Bhagwan in his article explained the role of community engagement in Indian academic institutions to interconnect and integrate to achieve better learning in both academics and societal context (Bhagwan, 2017). By culture and nature, there are service-learning roots in Indian education system, but it requires an emphasis in the regulations and guidelines. The NEP 2020, India fulfills it by adding in the form of need of adding community engagement and other professional development components in the education.

H. Invest in and Encourage Philanthropic Community Participation:

Students need to follow the entire stage of the engineering design process to brainstorm multiple solutions and select the most promising solution that meets the need, constraints, and functional requirements provided by the community partners. Service-learning requires extensive communication among all stakeholders of the projects, and students as a result, are expected to interact with community members, faculty, policymakers, etc., and build trustworthy relationships with them. Students are also expected to present the progress and results of the project to faculty and community partners through in-person on-field interactions, project reports, and presentations. The growth of philanthropists' efforts increased in the past few years across the world to improve livelihood of the communities around. Service-learning becomes a suitable means of engagement to meet the objectives of such initiatives (Hatcher & Studer, 2015). Service-learning as a curricular and pedagogical strategy helps in inculcating the philanthropic approach at large.

IV. CONCLUSION AND FUTURE WORK

In this paper, we conceptually analyzed service-learning as a pedagogy to understand the potential learning outcomes gained by students through such experiences and the scope. We were able to make a case for how service-learning experiences and as a pedagogy could help attain the objectives of NEP 2020. While the levels of attainment of the various objectives may vary, we report that service-learning experiences are strongly correlated to help students achieve the service-learning focused fundamental principles such as - Multidisciplinarity and Holistic Education, Emphasis on Conceptual Understanding, Encourage Creative and Critical Thinking, Ethics, Human and Constitutional Value, Life Skills, Formative Assessment, Respect for Diversity, Equity, Inclusion and Local Context, Rootedness and Pride in India, Invest and Encourage Community Participation. In the future, we plan to design a multi-method research methodology to capture the effectiveness of service-learning in attaining the objective of NEP 2020 following which, conduct interviews to get a better understanding of the intricacies of integrating service-learning into engineering undergraduate curriculum.

REFERENCES

- Aithal, P. S., & Aithal, S. (2020). Analysis of the Indian National Education Policy 2020 towards Achieving its Objectives. *International Journal of Management, Technology, and Social Sciences (IJMTS)*, 5(2), 19-41.
- Bandyopadhyay, K. R., Das, K., & Mahajan, R. (2021). Addressing diversity, equity and inclusion (DEI) through service learning in management education: Insights from India. *International Journal of Educational Management, ahead-of-print*(ahead-of-print). <https://doi.org/10.1108/IJEM-08-2021-0327>
- Berry, H. A., & Chisholm, L. A. (1999). *Service-Learning in Higher Education around the World: An Initial Look*. The International Partnership for Service-Learning, 815 Second Avenue, Suite 315, New York, NY 10017. <https://eric.ed.gov/?id=ED439654>
- Bhagwan, R. (2017). COMMUNITY ENGAGEMENT WITHIN A SOCIAL WORK PROGRAMME IN RURAL INDIA. *Social Work*, 53(3). <https://doi.org/10.15270/53-3-572>
- Billig, S. (2000). Service-learning impacts on youth, schools, and communities: Research on k-12 schoolbased service learning, 1990–1999. *Denver, CO: RMC Research Corporation*.
- Boyte, H. C. (2008). Against the current: Developing the civic agency of students. *Change: The Magazine of Higher Learning*, 40(3), 8–15.
- Campbell, C. G., & Oswald, B. R. (2018). Promoting Critical Thinking Through Service Learning: A Home-Visiting Case Study. *Teaching of Psychology*, 45(2), 193–199. <https://doi.org/10.1177/0098628318762933>
- Coyle, E. J., Jamieson, L. H., & Sommers, L. S. (1997). EPICS: A Model for Integrating Service-Learning into the Engineering Curriculum. *Michigan Journal of Community Service Learning*, 4, 81–89.
- Dewey, J. (1938). *Experience and education*. New York: Simon and Schuster.
- Dustker, S. M., Reddy, B. S., Kandakatla, R., Joshi, G. H., & Oakes, W. C. (2021, July 26). *Role of Reflection in Service Learning-based Engineering Programs: A Cross-cultural Exploratory and Comparative Case Study in India and the USA*. 2021 ASEE Virtual Annual Conference Content Access. <https://peer.asee.org/role-of-reflection-in-service-learning-based-engineering-programs-a-cross-cultural-exploratory-and-comparative-case-study-in-india-and-the-usa>
- EPICS Design Cycle. (n.d.). EPICS - Purdue University. Retrieved August 16, 2021, from <https://engineering.purdue.edu/EPICS/k12/EPICS-K-12/epics-design-cycle>
- Eyler, J., & Giles Jr, D. E. (1999). *Where's the Learning in Service-Learning? Jossey-Bass Higher and Adult Education Series*. ERIC.
- Eyler, J. (2001). Creating your reflection map. *New Directions for Higher Education*, 114, 35-43
- Fitch, P., Steinke, P., & Hudson, T. D. (2013). Research and theoretical perspectives on cognitive outcomes of service learning. *Research on Service Learning: Conceptual Frameworks and Assessment*, 2, 57–83.
- Galston, W. A. (2001). Political knowledge, political engagement, and civic education. *Annual Review of Political Science*, 4(1), 217–234.
- Hammersley, L. (2012). Community-Based Service-Learning: Partnerships of Reciprocal Exchange? *Asia-Pacific Journal of Cooperative Education*, 14(3), 171–184.
- Hatcher, J. A., & Bringle, R. G. (1997). Reflection: Bridging the Gap between Service and Learning. *College Teaching*, 45(4), 153–158. <https://doi.org/10.1080/87567559709596221>
- Hatcher, J. A., & Studer, M. L. (2015). Service-Learning and Philanthropy: Implications for Course Design. *Theory Into Practice*, 54(1), 11–19. <https://doi.org/10.1080/00405841.2015.977656>

- Heffernan, K. (2001). Service-learning in higher education. *Journal of contemporary water research and education*, 119(1), 2.
- Hurd, C. A. (2008). Is service-learning effective? A look at current research. *Service Learning: Perspectives and Applications*, 1-11.
- Irfan, M. M., & Sammaiah, P. (2017). Service Learning Course in the Engineering Curriculum: EPICS. *Journal of Engineering Education Transformations*, 0(0), Article 0.
<https://doi.org/10.16920/jeet/2017/v0i0/111812>
- Kandakatla, R., Dustker, S. M., Reddy, B. S. & Oakes, W. C. (2022). *Conceptual Analysis of Learning Outcomes achieved through Engineering Project Focused Service-learning Programs in India and their alignment with NBA Graduate Attributes*. [Manuscript under review]
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.
- Lima, M., and Oakes, W. C. (2014). *Service learning: Engineering in your community*. New York, NY: Oxford University Press
- Luckritz Marquis, T. (2021). Formative assessment and scaffolding online learning. *New Directions for Adult and Continuing Education*, 2021(169), 51–60.
<https://doi.org/10.1002/ace.20413>
- McClam, T., Diambra, J. F., Burton, B., Fuss, A., & Fudge, D. L. (2008). An Analysis of a Service-Learning Project: Students' Expectations, Concerns, and Reflections. *Journal of Experiential Education*, 30(3), 236–249.
<https://doi.org/10.1177/105382590703000304>
- Mentkowski, M., Rogers, G., Doherty, A., Loacker, G., Hart, J. R., Rickards, W., O'Brien, K., Riordan, T., Sharkey, S., & Cromwell, L. (2000). *Learning that lasts: Integrating learning, development, and performance in college and beyond*. Jossey-Bass.
- MyGov. (2020). National Education Policy 2020. Retrieved from <https://innovateindia.mygov.in/nep2020/#list-item-4>
- Naik, S. M., Bandi, S., & Mahajan, H. (2020). Introducing Service Learning To Under Graduate Engineering Students Through EPICS. *Procedia Computer Science*, 172, 688–695.
<https://doi.org/10.1016/j.procs.2020.05.090>
- Oakes, W., Duffy, J., Jacobius, T., Linos, P., Lord, S., Schultz, W. W., & Smith, A. (2002). *Service-learning in engineering*. 2, F3A-F3A.
- Oakes, W., Zoltowski, C. B., & Huff, J. (2014). Engineering Service-Learning: A Model for Preparing Students for Engineering Practice while meeting Needs of the Underserved. *Journal of Engineering Education Transformations*, 27(4), 46–56.
<https://doi.org/10.16920/jeet/2014/v27i4/53300>
- Rutter, R. A., & Newmann, F. M. (1990). Community service to enhance civic responsibility. *The Education Digest*, 55(8), 33.
- Saylor, J., Hertsenber, L., McQuillan, M., O'Connell, A., Shoe, K., & Calamaro, C. J. (2018). Effects of a service learning experience on confidence and clinical skills in baccalaureate nursing students. *Nurse Education Today*, 61, 43–48.
<https://doi.org/10.1016/j.nedt.2017.11.009>
- Stanton, T. K., Giles Jr, D. E., & Cruz, N. I. (1999). *Service-Learning: A Movement's Pioneers Reflect on Its Origins, Practice, and Future*. Jossey-Bass Higher and Adult Education Series. ERIC.
- Sudhakara Reddy, S., Rajeswaran, N., & Kesava, V. K. V. (2018). Strategic Planning to Promote Engineering Projects in Community Service(EPICS) in Engineering Institutions. *2018 World Engineering Education Forum - Global Engineering Deans Council (WEEF-GEDC)*, 1–4.
<https://doi.org/10.1109/WEEF-GEDC.2018.8629759>