Academic Service-Learning as a Factor for the Development of Autonomous Learning Skills at Universities

Nataliya MUKAN¹,
Yuliana LAVRYSH²,
Oresta KLONTSAK³,
Olena MUKAN⁴,
Tetiana HOROKHIVSKA⁵,
Oleh STECHKEVYCH⁶

¹Sc.D. Professor, Department of Pedagogy and Innovative Education, Lviv Polytechnic National University, Lviv, Ukraine, nataliya.v.mukan@lpnu.ua

²PhD, Assoc. Prof., Department of English for Engineering, Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine, yulavrysh@gmail.com

³PhD, Department of Social and Humanities Disciplines, Andrei Krupynskyi Medical Academy of Lviv, Lviv, Ukraine, omulyak@yahoo.com

⁴PhD, Assoc. Prof., Department of Doctoral and Post-Graduate Studies, Lviv Polytechnic National University, Lviv, Ukraine, olena.v.mukan@lpnu.ua

⁵PhD, Assoc. Prof., Department of Pedagogy and Innovative Education, Lviv Polytechnic National University, t.gorohivska@gmail.com

⁶PhD, Senior Researcher, Department of Pedagogy and Innovative Education, Lviv Polytechnic National University, oleh.o.stechkevych@lpnu.ua

Abstract: In recent years, there has been a growing interest in the issues of academic service-learning in the system of higher education which is particularly important for modern pedagogical theory and practice. The article outlines the peculiarities of academic service-learning integration into the system of university education as autonomous learning fostering factor. The concept of “academic service-learning” has been specified in the article. It has been determined that academic service-learning is based on the principles of different scientific and pedagogical theories, including pragmatism, experimental learning, critical pedagogy, constructivism, social constructivism, and postmodernism. We employed an empirical method of the experiment data analysis to verify our hypothesis that service-learning fosters the development of autonomous learning. Participants from three Ukrainian universities took part in the research performing different community-engaged activities. Students’ level of autonomous learning skills was measured and compared at pre and post stages of the experiment. In order to practice the skills of autonomous learning, students had to carry out a social activity planned and organized themselves with partial educators’ support. Considering the results of the research, we developed recommendations on the successful integration of academic service-learning into higher education with the focus on autonomous learning skills development.

Keywords: *academic service-learning; autonomous learning; educational process; social activities; community engaged education.*

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1. Introduction

Currently, higher education of Ukraine is characterized by the implementation of reforms in accordance with the international tendencies in the transformation of education towards the needs of modern society. The main task of university education is the training of highly qualified specialists, involving young people in social life, developing students as active citizens of their country. Establishing the connection between university education and the development of civil society and involving future specialists in socially meaningful activities are becoming increasingly important.

Nowadays the combination of the educational process and social activities, which is known as academic service-learning, has gained widespread popularity worldwide. The goal of academic service-learning implementation at institutions of higher education is to acquire scientific, professional knowledge and skills in the process of performing socially meaningful activities. The use of this educational strategy not only augments the efficiency of the educational process, but also supports the training of specialists, develops their professional competence, and forms students' personal position in society. Students should study in order to build a democratic community, critically evaluate social problems, and make appropriate changes in public institutions. Supporters of an academic service-learning claim that a successful democratic society requires active citizens, which calls for new forms of education that are not always regulated and generated by educational establishments. In terms of a lifelong learning framework we all need a high level of self-directed or autonomous learning skills in order not to be lost in permanently changing and demanding realm. We strongly believe that intrinsically motivated autonomous learning is a key skill to ensure continuous professional development.

This research intends to determine the extent to which academic service-learning can enhance the development of autonomous learning skills. This study is designed to assess the hypothesis that if students participate in academic service-learning projects, they will improve their autonomous learning skills.

2. Literature review

There is a large number of published studies that describe philosophical foundations, the characteristics of the development of academic service-learning. Giles and Eyler believe that the present strategy

of academic service-learning is based on Dewey's educational philosophy. They also found that there were almost 150 definitions of the concept of "academic service-learning" in American scientific literature (Eyler, 2002). American scholar Pacho (2015) supports this idea and states that "the theoretical and pedagogical principles of service-learning are rooted in John Dewey's theory of experience and education, including his ideas of democracy as a way of life, where everybody has to participate in order to bring democratic values to life, the idea of learning from experience and linking the school to the community" (p. 8). Some American educators highlighted students' active role in the educational process and social life; the importance of internal motivation formation, the sense of responsibility for their own educational and socially significant activities (Kerins, 2010; Pacho, 2015).

To date, a number of studies have demonstrated organizational and self-organized facets of academic service-learning in higher education in the framework of the personal transformations (Eyler, 2002; Tinkler, et al., 2014). Thus, Goodhue (2017) focused on the impact of academic service-learning on the development of a personality. Umpleby and Rakicevik (2008) paid their attention to obstacles to implementing academic service-learning, including cultural differences; faculty motivation; curriculum limits. Thus far, several authors considered the peculiarities of civic education and students' engagement in social activities (Bringle, Clayton & Price, 2009).

Academic service-learning is a modern strategy in the US and European systems of education including university education. It provides an active involvement of students into the implementation of the curriculum through community service and the purposeful combination of the educational process with social activities according to the aim and objectives of higher education and provides the formation of professionally competent specialists with critical, creative thinking as well as committed citizens' education; promotes the development of a democratic society.

According to Galston (2001) "Service-learning – a combination of community-based civic experience and systematic classroom reflection on that experience – is a promising innovation, but program evaluations have yielded mixed results" (p. 217). The researcher also states that "over the past decade, the most rapid growth occurred in a different form of civic education, called service-learning" (Galston, 2001, p. 229). Westheimer and Kahne (2004) state that the formation of a civic position in a democratic society involves more than teaching kindness and decency, it involves focusing efforts on solving complex social problems (p. 237).

Based on the analysis of scientific sources we have found that academic service-learning is based on the principles of different scientific and pedagogical theories. The main pedagogical objectives, principles of philosophy of pragmatism, experimental learning, critical pedagogy, constructivism, social constructivism, and postmodernism laid the foundation of an academic service-learning organization at universities. Having analyzed the literature, we found out that the system of academic service-learning comprises individual, psychological, interpersonal, and socio-cultural aspects, and its structural components include the student's personality; defining the task; experience; critical reflection; mediated learning; formation of integrated concepts by the student.

Community-engaged learning can be integrated into a variety of courses demonstrating its universal character, usefulness, and feasibility. Thus, Heffernan (2001) differentiated six models of academic service-learning: discipline-based model, problem-based model, capstone course model, service internship model, action research model, and extra credit model. The author also suggests ways and forms of academic service-learning implementation. Among these forms are group projects included in the curriculum as practical sessions; some parts of coursework substitution with a community-based component; participatory action research addressed to the solution of community needs; interdisciplinary projects as a summative assessment to demonstrate the acquired knowledge at hand.

An efficient implementation of academic service-learning requires not only a high level of hard skills but also a wide range of soft skills such as critical thinking, creativity, communication, leadership, and self-directed learning skills. Students are able to develop those skills being out of classes by performing some socially meaningful activities. Therefore, students need an understanding of how to organize their self-directed learning and how to reflect on the results of such kind of learning. The confirmation of the positive impact of autonomous learning on students' personal and cognitive development is found in the research of Kim et al. (2014) who see the distinctive nature of autonomous learning through the combination of such characteristics as flexibility (freedom of choice and designing own learning); learner ownership; learner empowerment (access to meaningful resources, content, and technologies). The wide range of literature sources suggests a great number of views on key personality traits and abilities for a self-directed learner. Among such specific personal traits, Wang & Holcombe (2010) and Zimmerman (2008) outline intrinsic motivation, persistence, determination, responsibility, and curiosity.

With this in mind, we consider that properly organized academic service-learning provides students with the above-mentioned abilities and knowledge to become a self-directed learner.

3. Research methodology

We presume our action research key issues are of explanatory (how) and mediating essentiality (tools for improvement). Thus, we decided to perform our research in the framework of the Design Research Methodology (Blessing & Chakrabarti, 2009). This methodology reflects the main principles of the research (applicability, authenticity, evidence-based) and consists of four stages: Research Clarification, Descriptive Study I, Prescriptive Study, and Descriptive Study II. The research clarification stage implies the critical analysis of the literature sources, finding pieces of evidence, and open questions, making the assumption that induced the formulation of the research goals. The second stage is for the empirical data collection and analysis, outlining a current situation to find out what are the causes of the problem and what should be improved. The third stage, prescriptive study, works on the substantiation and testing of initial assumptions and interventions. The last stage, descriptive study II, is applied for the evaluation of the efficiency, feasibility, and conditions of the best practice and interventions described in the previous stage.

3.1. Research data collection

In the process of selecting the data collection tools we chose those which could contribute to the solution to the research problem. Therefore, we used the following data collection methods: documentation review, interviews, observation, discussions with field experts and community members, questionnaire for autonomous learning skills level assessment, and reflective learners' logs. The reflection of students' logs included participants' activities and reflective perception of successful and problematic issues. Documentation review (syllabus, teachers' and community leaders' reports, rubrics for assessment, action plans, project agenda) was used for analysis and comparison of the data from all participants of the project. This tool equipped us with extra information about skills development dynamics. At the end of the projects we carried out unstructured interviews with open-ended questions among students and community members. The personal students' and community members' opinions were influential to perceive the challenges and perspectives of the experiment. The data collection tools were correlated with four stages of the research methodology. Observations, discussions with field experts and

community members as well as reports were collected during all four stages; documentation review was performed during the research clarification and prescriptive stages; interviews were held during the two last stages; level tests were carried out during the first and last stages.

The process of autonomous learning skills level questionnaire design and performance requires some clarifications. As a tool to assess the level of learners' autonomy we took as a background the scale developed by Bei et al. (2020). The valid psychometric scale consists of two subscales: personal and educational. There is a wide range of autonomy level measurement scales, however, we chose the mentioned one due to its reflection of the autonomy essence that highlights the correlation of personal and education autonomy dimensions. In order to match this scale with the goals of our research we added the subscale about students' perception of academic service-learning and our questionnaire included the following questions:

1. Personal dimension:
 - I understand my learning needs and can choose what and how to study.
 - I know my learning abilities.
 - I am aware of the problems that might arise during new knowledge acquisition but I can cope with them alone.
 - I am ready to face educational challenges.
 - I regard my mistakes as experience.
 - I am self-organized.
2. Educational dimension:
 - I know how to choose educational resources that match my goals.
 - I am able to find an alternative solution to my educational problems.
 - I am able to perform self-monitoring of my academic results.
 - I can plan my studying.
 - I can identify my educational problems and apply to a teacher in case I need support.
 - I take responsibility for my academic achievements.
3. Social learning dimensions:
 - social learning contributes to my professional education;
 - social learning increases my motivation for additional self-initiated field-related learning;
 - due to social learning I can monitor the level of acquired knowledge and find gaps;

- social learning develops my adaptability and flexibility skills;
- social learning helps me to control my negative emotions in case of a mistake or a failure.

3.2. Research data analysis tools

The Likert scale was employed to analyze questionnaire answers. Students had to answer in accordance with the scale to what extent they agree or disagree with the statements: 1-strongly disagree, 5-strongly agree. To assess students' reflective logs, documents, and interviews we applied the method of the modified content analysis Fraenkel and Wallen (2003), as a measurement tool to define tendencies and categorizing data (words or specific frames) obtained through interviews, literature review and observations. We created a code list with more than 45 coding frames that could be identified in participants' reports (self-initiated learning, academic service-learning, social work, autonomy, self-assessment, self-monitoring, responsibility, planning, learning needs, etc.). We performed the content analysis by means of ATLAS software.

3.3. Research Procedure

The research consisted of three parts: pre-test for autonomous learning skills level, service project performance, and post-test for autonomous learning skills level. The project's idea was to help retired teachers of mentioned universities to get acquainted with modern technology to become active members of modern society through the program 'Country in a smartphone' initiated by the Ukrainian government. This program gives the opportunity to arrange a doctor's meeting, to check payments, to get access to medical facilities. Elderly people experience some difficulties with digital innovations and require help. Students were suggested to perform diagnostics of community members' needs and choose their own teaching strategies, set goals, plan steps, outline outcomes, and assess their own resources and possibilities. The duration of the project was one month. Previously, students had some experience in community-engaged activities and took part in some short-termed service initiatives: a field – related discussions with pupils at schools to promote specialty, conducted lectures for pupils about robots, and sustainable development. But all those cases were teacher-led and students had to perform given tasks without an opportunity to organize or change the content of the activity. Before and after the project students answered the questionnaire about the level of autonomy skills, during the projects students could consult with teachers or community leaders to solve problems or get in time support. At

the end of the project we arranged a feedback interview with teachers, students, observers, and community members regarding positive and negative issues of the project, challenges and achievements, perspective of such projects, and possible implementation into the curriculum.

3.4. Research Participants

The research participants involved (100) bachelor engineering students of the third courses from Lviv Polytechnic National University (45), Igor Sikorsky Kyiv Polytechnic Institute (30), and third-year medical students from Andrei Krupynskyi Lviv Medical Academy (25). Our students were involved in the government initiated a program of digitalization that was arranged for all people of Ukraine, and a lot of elderly people needed digital assistance in many Ukrainian cities. Therefore, we, as teachers of humanitarian disciples (pedagogy, language, and psychology), organized the project in three institutions of higher education to embrace more people who experience troubles with assimilation into digital society and service. We decided to engage third-year students because according to the syllabus they had the field-related subject and had enough theoretical background to integrate it into practice. Students' participation was voluntary and they were provided with all necessary information about the experiment procedures, purposes, and outcomes. Except for participants, we had internal observers from universities and external observers from the local community. The observers' task was to perform monitoring of the process and define problems.

The data collection has been performed according to general standards of research ethics as recommended by the Academy of Pedagogical Science and was approved by the Research Board of every University. Before the experiment started, participants were informed about the nature of the experiment, the confidentiality of the observation data, their right to familiarize themselves with the experiment results, and were asked for their permission to publish the results of the experiment. Students could stop participation at any time without any academic consequences. It was emphasized that results did not deal with individual abilities assessment and data would not influence academic performance.

4. Results

In order to find evidence-based on our hypothesis, we performed pre and post questionnaires to assess students' autonomy learning skills. Table 1 below illustrates the comparative data of two questionnaires

according to three dimensions. We collected responses and applied descriptive statistics to identify the most common responses to each statement and the dispersion of the responses. We calculated the median value for every dimension as was suggested by **Kostoulas** (2014).

Table 1. Autonomous learning skills assessment

Dimensions	Strongly disagree		Disagree		Undecided		Agree		Strongly agree		Median	
	1	2	3	4	5							
	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post
Personal dimension: (n=100)												
I understand my learning needs and can choose what and how to study.	16	8	13	10	36	22	20	34	15	26	2,3	3,5
I know my learning abilities.	11	5	18	10	42	30	19	33	10	22	3	4
I am aware of the problems that might arise during new knowledge acquisition but I can cope with them alone.	5	3	17	13	39	21	27	46	12	17	2	3,3
I am ready to face educational challenges.	6	4	23	15	41	27	22	42	8	12	2,2	4
I regard my mistakes as experience.	3	0	27	8	17	11	35	57	18	24	3	5
I am self-organized.	10	5	35	15	15	10	27	47	13	23	3,3	4,4
Educational dimension:												
I know how to choose educational resources that match my goals.	13	5	16	10	36	22	20	38	15	25	3	4
I am able to find an alternative solution to my educational	5	4	19	13	41	30	23	42	10	12	2,3	3,3

problems.													
I am able to perform self monitoring of my academic results.	13	5	16	13	42	27	19	33	10	22	3	4	
I can plan my studying.	3	0	7	2	10	5	48	56	32	37	4,4	4,5	
I can identify my educational problems and apply to a teacher in case I need support.	5	3	19	15	37	21	28	46	11	15	3,3	4,5	
I take responsibility for my academic achievements.	4	0	9	2	33	9	30	57	24	32	3,4	5	
Social learning dimension:													
Social learning contributes to my professional education.	15	2	27	10	24	10	24	53	10	25	2,3	4,5	
Social learning increases my motivation for additional self-initiated field-related learning.	7	4	24	15	49	33	12	35	8	13	2	3,4	
Due to social learning I can monitor the level of acquired knowledge and find gaps.	11	5	20	8	42	30	19	35	8	22	2,2	3,3	
Social learning develops my adaptability and flexibility skills.	12	5	45	15	15	10	17	47	11	23	2	3	
Social learning helps me control my negative emotions in case of a mistake or a failure.	7	3	21	16	35	23	25	43	10	15	2,3	4	

With a view of visualizing our findings, we counted the average point of median value increment for three dimensions of the autonomous learning by means of academic service-learning and created a bar chart (Figure 1) to demonstrate the dispersion of the trends. The changes of median between pre and post findings were as follows: personal dimension increased of 7.5 points; education dimension increased of 5.5 and social service dimension increased of 7 points.

Figure 1. Autonomous learning skills increment by dimensions

Regarding the content analysis performed during the experiment and after it, we distributed documents, interviews, and students' reflexive logs into four specific categories: positive connotations, negative connotations, mixed and neutral connotations. The finding demonstrated a wide range frequency of mixed ($n = 291$), positive ($n = 262$), and negative ($n = 187$) connotations to learners' autonomy and academic service-learning while the number of neutral connotation was less than 100.

Taken together, these results suggest that there is a connection between autonomous learning skills enhancement and academic service-learning. The next part of our paper provides some discussion and a possible explanation of this interrelation.

5. Discussion

The findings of our research confirm that academic service-learning comprises the process of planning, informing students about the content and procedure of educational and social activities, familiarizing students with the organization of further activities based on specific examples, preparing the necessary resources, participating in discussions and conferences, recognizing the students' success (obtaining scholarships, publications in scientific journals), regulation of the process of learning and social activities by monitoring, evaluating the results (obtained knowledge, skills, impressions). Our results support the idea of Pereira and Arriaga (2020) that academic service-learning is an important component of university education since it promotes not only the effective formation of knowledge, skills, and abilities of future specialists but also provides their cognitive, emotional, social and personal development.

As it was hypothesized academic service-learning contributes to the development of autonomous learning and the results of the experiment described above confirm our assumption. Nevertheless, the reason for our interest in learners' autonomy should be justified. The project was developed by teachers of not major engineering or medical disciplines but humanitarian ones. The idea of the experiment was connected with recent social changes and the digitalization of our community services. Moreover, teachers of humanitarian disciplines not only improve language, psychology, or pedagogical competence but also try to develop students' soft skills of communication, collaboration, teamwork, critical thinking, creativity, etc. We consider the skills of autonomous learning as crucial soft skills that are necessary for a future successful career in any profession. Autonomous learning is a strategy that enhances students' responsibility for their learning process results in the same as the results of their future professional solutions. The strategy implies learning needs identification, setting learning goals, selection of learning strategies and resources, achievements assessment. The core idea of autonomous learning is expressed by Brookfield (2013) "Learning in which decision around what to learn, how to learn it, and how to decide if one has learned something well enough are all in the hands of learners" (p. 90).

First, we would like to mention that before our research most students did not regard themselves as self-directed learners and knew little about academic service-learning. Moreover, some of them indicated disagreement with the statement that academic service-learning would impact their field-related knowledge and skills. However, opinions seemed

to be divided concerning educational autonomy and many respondents agreed with the idea that they were able to choose, monitor, and plan their studies themselves.

Considering findings of content analysis, we observed that students, whose narratives in logs and interviews were marked as positive, demonstrated abilities to construct meaningful learning environment for themselves and community members, expressed respect, compassion, and patience while teaching elderly people to use smartphones. Students with negative connotations, as a rule, could not organize their learning and demonstrate less motivation during the experiment. However, when they received support from community members, students changed their behavioral patterns and tried to be more responsible and careful. Those changes contributed to the improvement of academic achievements in field-related disciplines due to the growth of personal self-confidence. The most frequent narration discourse was mixed that was associated with achievements (positive), failures (negative), and personal attitude of students towards academic service-learning activities. It was unexpected that neutral connotations were not frequent. In our opinion, it is explained by the fact that academic service-learning evoked emotional engagement in students and did not leave them indifferent to their activities.

Speaking about activities and tasks, students had to choose a topic for teaching according to community members' needs. All activities were out of classes in students' free time, so it was a challenge for us to motivate students to perform these activities. So, we involved those students who demonstrated motivation to perform such kind of social work and were ready to share their time helping elderly people. Among the learning needs students singled out: how to use smartphones to check the bank account and operations, how to pay for public utilities, how to use browsers, how to arrange a visit to the hospital or register medical documentation, how to adjust medical software to control health indicators. Students developed the plan of teaching, selected and adapted resources and ways of communication with community members. On average the teaching process took three weeks and one week for self-practice without students' active participation but with their distant support. The total number of students was 100 and the number of community members was 135, so some of them were distributed into groups according to their needs. All of the community members were satisfied with the teaching process as well as the students themselves. Among challenges students mentioned the problems with communication strategies development, planning of the process according to individual learning abilities, choosing educational resources and methods to teach and

low level of their process management and organizational skills. We would like to emphasize that all the mentioned challenges reflect students' problems in terms of autonomous learning skills. Therefore, while completing the task, students explicitly developed and trained their self-directed learning skills.

Despite the evidenced efficiency of academic service-learning towards autonomous learning, one of the issues that emerge from these findings is how to integrate academic service-learning and motivate students to participate in it. According to Heffernan's (2001) classification of service-learning we adopted a problem-based model that was related to the objectives of our research. Students work with community members to understand their needs and suggest solutions that are based on the integration of cumulative knowledge in real-life issues. Students did not perceive these projects as studying a discipline but rather as assistance and support and it influenced their motivation. Another important point is reciprocity that implies equal and respectful relations among students, teachers, and community members as colleagues that empowers students with self-confidence and fosters self-organization skills.

In order to support students and help them with the project we carried out discussions during our lessons, in particular lessons of the English language where students could share with their ideas and worries. These discussions facilitated reflection not only with a teacher but with peers as well. We analyzed ethical cases, communication strategies, and management of the process so students did not feel isolated and helpless. Also, during discussions students performed a self-assessment on how effectively they match learning and community objectives. It should be mentioned that self-monitoring and assessment skills are fundamental skills for personal and educational autonomy (Saenko & Lavrysh, 2020). At the end of our project we organized a reflective discussion with all participants of the projects where students and their mentees presented the achievements of mutual learning and shared their recommendations and experience.

Apart from autonomous learning skills development, we singled out some more benefits of community-engaged learning integration both for students and faculty. Among students benefits there is rising self- and personal efficacy, demonstration of the field-related course content relevance, leadership skills, development of social responsibility, personal and cognitive development. Due to academic service-learning, faculty as well as teachers receive improved students retention and academic achievements and outline new perspectives for future research and publication. Despite all

the above-mentioned benefits, we cannot omit some challenges we encountered with: time-consuming process of the project coordination, unexpected and unpredictable effects of a human factor, and personal intolerance, the system of students' progress evaluation due to the absence of grades. To overcome these challenges we recommend: apply to the most urgent community need, establish a trustful supportive partnership between students and community, create flexible project design, set realistic expectations for project goals among community members, they should clearly understand students' capacities, evaluate students' impact, not exact skills.

6. Conclusions

The most obvious finding to emerge from this study is that academic service-learning can significantly improve autonomous learning skills. The present study adds to the growing body of research that indicates the endless benefits and opportunities for academic service-learning integration. Further studies regarding the connection of academic service-learning and students' motivation to study or carry out research would be worthwhile.

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