Service-Learning (SL) is an innovative pedagogical practice that combines services addressing the needs of the community with learning opportunities offered to students, in the context of their civic development and participation. Recent analysis of the readiness and awareness toward SL practices at Babes-Bolyai University, which is one of the largest state universities in Romania, indicate an expressed need of the academic personnel toward SL training programs. A SL training curricula is currently being tested at BBU within an Erasmus + project (www.slihe.eu), with promising results in terms of the interest toward SL implementation of the first generation of trained academic members. The qualitative analysis of the post-SL training reflections indicate the need to include an interdisciplinary learning objective in the existing structure of the program, addressing the neurobiological and evolutionary explanations of the benefits of helping others. The aim of this paper is to perform a systematic analysis of the literature in order to outline an interdisciplinary learning objective to be included in the existing SL training curricula for academic personnel, that could facilitate not only a better understanding of the benefits of the community-oriented pedagogy, but also the motivation for social participation of academic staff and students. A systematic review protocol was used, following the procedures described in the literature. The reviewed articles were selected from the ISI Web of Knowledge, ProQuest and ScienceDirect, based on the searching keywords: “neurobiology of helping”, “evolutionary mechanism of volunteering”, “benefits of volunteering”, “benefits of SL”. A number of 14 articles were included in the final analysis. Following the qualitative literature analysis, the proposed learning objective (LO) refers to the interdisciplinary approach to the mechanisms behind helping others in the context of Service-Learning – from neurobiology to behavior. The LO introduces the idea of the endogenous opioid system (EOS) as a potential mediator of volunteering, with special attention on the structured type of volunteering, which is an important component of the SL practice. Models and empirical evidence of the mechanisms and adaptive value of helping unrelated others are discussed and integrated in the context of community-oriented pedagogy.

Keywords: Service-Learning training, neurobiology of helping, health benefits of volunteering.

1 INTRODUCTION

Service-Learning, also known as community-based learning [1], is seen as an emerging innovative pedagogical practice that combines services addressing the needs of the community with learning opportunities offered to students, in connection to the content of their competencies-based curricula and with clear reflection component on the activities and their outcomes. In terms of historical emergence, literature in the field indicates that experiential education is considered one of the academic parents of SL [2]. Most of the SL programs in the academic environment have tradition in the US space [3]. The community engagement history of the academic environment through SL can be found in a comprehensive presentation in the work of Dostillio [3], "The community engagement professional in the emerging field". According to Dostillio [3], some of the identified elements that are favoring the inclusion of SL programs in the strategic objectives of the HEIs are: reconsidering the students' potential as agents of social change and realigning the mission of universities with the needs of the community, existent scientific evidence of the effectiveness of SL practices on defined variables (individual, group, community partners etc.), the evolution of voluntary programs towards SL (curricular connection, reflection component, civic learning and civic competencies), outlining clear models of SL implementation at institutional level, with emphasis on the needs of teachers, students and the community [4].
In the context of SL implementation, the main components that define the competencies required for university teachers to connect their curricula with the needs of community are: knowledge (about SL, functional support from the University - departments, school, curricular openings, etc.), skills and dispositions [3]. The results of a recent survey of the readiness and awareness toward SL practices among the academic personnel of Babes-Bolyai University, which is one of the largest state universities in Romania, has indicated a strong need for training programs in Service-Learning [5]. In line with this, a SL training curricula is currently being tested at Babeș-Bolyai University, with promising results in terms of the interest toward SL implementation of the first generation of trained academic members. The SL training program was developed within the Erasmus Plus International Project (SLIHE), entitled Service Learning in Universities - Promoting the Third Mission of Universities and Civic Involvement of Students and civic engagement of students (www.slihe.eu). The SLIHE project includes a consortium of six European Higher Education Institutions institutions (Slovakia, Czech Republic, Romania, Germany, Croatia and Austria) and two non-European institutions. The idea of forming this academic consortium was based on reconsidering the position of universities towards their third mission, i.e. their social role, reflected in their involvement in community and society, considering that one of the pedagogical strategies to accomplish this mission is SL. The main purpose of the SLIHE project is to solidify the capacity of the Central and Eastern European universities to fulfill their social role by implementing the SL strategy tailored to the educational context (development of training tools and materials).

In the case of SL training delivery at Babeș-Bolyai University within the SLIHE project, the qualitative analysis of the post-training reflections indicates, among other aspects, the need to address in more details the benefits of participation in helping-others activities [5]. This identified need supports the idea of including an interdisciplinary learning objective in the existing structure of the SL-training program for academic personnel, that would address the neurobiological and evolutionary explanations behind the benefits of helping others through structured activities, such as volunteering and Service-Learning. The aim of this paper is to perform a systematic analysis of the literature in order to outline the components of the interdisciplinary Learning Objective to be included in the existing SL training curricula for academic personnel, that could facilitate not only a better understanding of the benefits of the community-oriented pedagogy, but also increase the motivation for social participation of academic staff and students.

2 METHODOLOGY

A systematic review protocol was used, following the procedural steps described in the literature ([6]; [7]): needs analysis for review, formulation of research questions to be answered, keywords identification, and inclusion criteria for the studies. The reviewed articles were selected from the ISI Web of Knowledge, ProQuest and ScienceDirect, based on the searching keywords: “neurobiology of helping”, “evolutionary mechanism of volunteering”, “benefits of volunteering”, “benefits of SL”. A number of 14 full-text articles (published between 2000–2018) were included in the final analysis, allowing for the development of a new interdisciplinary learning objective to be included in the SL training curricula for academic staff.

3 RESULTS

The qualitative analysis of the papers included in this review has allowed the formulation of the following Learning Objective to be added to the existing SL training curricula: SL trainees should be able to understand the the neurobiological mechanisms behind the health-related benefits of helping others in need. The curricular elements that should facilitate the achievement of this LO are placed within the frame of the adaptive significance of human prosocial behavior, specifically of the tendency to help others in need. The qualitative review has allowed the identification of two main themes are believed to support the proposed LO, as it follows: (1) the neurobiological substrate of successful prosocial interactions in humans, and (2) activation of caregiving motivation in situation of helping others in need. It is important to mention that, along with other neurobiological and evolutionary models of the process of helping others, these two themes have been described in details in a chapter that could serve as theoretical support for the proposed LO, i.e. “Endorphins and volunteering: On the Evolutionary Significance of Helping Others” [9].
3.1 Neurobiological substrate of successful prosocial interactions

Across scientific disciplines, the study of the mechanisms behing the process of helping conspecifics in need have commonly focused on the adaptive significance of human prosocial behavior ([9]; [10]; [11]). Literature indicates that prosocial behavior is “a broad category of acts that are defined by some significant segment of society and/or one’s social group as generally beneficial to other people” [12]. According to this definition, volunteerism (and Service-Learning) fits into the category of prosocial behavior in humans. Moreover, volunteerism implies no expectation of pay or other material benefits to the volunteers [13]. Two types of volunteering are generally referred to in the literature: formal volunteering, which is done through some association and organizations; and informal volunteering, which is done directly, with no associations. Formal volunteering implies organized activities based on the identification of specific needs of the recipients, while informal volunteering is most commonly a spontaneous activity, often driven by immediate needs in a current situation [13]. Both types of volunteering are predominantly directed to unrelated persons and are considered succesful social interactions.

Part of the studies included in this review address the neurobiological substrate of successful social interactions in the context of prosocial behavior, such as offering and receiving help from others in situations of need (including community-oriented activities), point toward the rewarding value of these types of interactions for humans [14]. Specifically, several neurotransmitters and neurohormones are mentioned in relation to the health-related benefits of volunteering, i.e. psychological and physiological benefits. Hence, dopamine, which is a catecholamine produced in several areas of the brain, that functions both as neurotransmitter and as neurohormone, is one of the most commonly suggested candidates for the potential explanation of the phenomenon often referred as “volunteer’s high” or “helper’s high” [15]. This phenomenon is commonly described as a sensation of pleasure and subjective happiness associated with the participation in volunteering and charity activities.

Another neorobiological system which is mentioned in two of the reviewed studies to underpin the positive social interactions that involve direct physical contact in primates, i.e. grooming, is the engodegous opioid system ([16]; [17]). The endogenous opioid system (EOS) is one of the most studied pain-relieving systems, consisting of widely scattered neurons that produce three opioids: beta-endorphin, the met- and leu-enkephalins, and the dynorphins [18]. One can infer that, in humans, volunteering may promote social connectedness among large communities in the same ways as grooming in other species of mammals, such as primates [9]. Moreover, the existence of coordinated programs of volunteering means that this type of grooming-like behavior can be simultaneously directed to multiple members of the same community (e.g., activities in which help is being simultaneously offered in a coordinated manner to a whole community by volunteers belonging to the same organization).

While less direct evidence of the connection between the EOS and social behavior exists in humans, especially between EOS and volunteering, Launay et al. [17] identified areas of the brain with high concentrations of opioid receptors that are responsive to social rejection and acceptance [19]. In line with this, one of the studies included in the qualitative review indicates that experimental interference with EOS activity in humans can affect the perception of positive social stimuli [20].

Several studies suggest that volunteering can bring significant benefits to volunteers at subjective levels of well-being that have physiological underpinnings ([21]; [22]). There is an increasing body of research, including experimental and quasi-experimental studies (e.g., awareness programs and coordinated activities for students aiming to increase their civic participation), indicating that volunteers report more positive affects and higher self-esteem compared to non-volunteering control group participants ([22]; [23]; [24]). Nonetheless, research on the neurophysiological mechanisms hypothesized to underlie the reported benefits of volunteering is currently lacking. For example, dopamine is a neurotransmitter often associated with reward and pleasant emotions. The neural regions that produce dopamine have been found to be those that are most active when someone makes charitable donations [25], contributing to an assumption that dopamine may be responsible for the “warm glow” experience of giving [26]; however, there is no direct evidence for this. Conversely, there is evidence that those inclined to give may experience more subjective pleasure from charitable behavior than those who are not inclined to give [27].

Hormones are also proposed as a neurophysiological mechanism of the benefits of helping others in need. Oxytocin is a neuropeptide implicated in positive social interactions, which would be logically associated with volunteering. Although there are studies indicating that nasally administrated oxytocin (compared to a placebo) was associated with an increase in motivation to donate in male participants
[28], there are not yet studies examining a direct connection between oxytocin release and volunteering behavior [22].

3.2 Caregiving motivation in situations of helping others

In their attempt to provide an integrative explanation of research on the connections between helping others and health benefits for the helper, Brown and Brown [29] propose a neurobiological model of prosocial behavior aiming to identify the neuronal substrates behind the health-related benefits of helping behavior. The model is referred to as a caregiving model, which, at its primary evolutionary significance, like the parental caregiving system [30], functions on a fitness-improvement logic (i.e., in the direction of achieving a safe social environment for the preservation of community).

Regarding the health effects of helping others in need, Brown and Brown [29] hypothesize that prosocial motivation (caregiving motivation) is part of a chain of interconnected biochemical events that function in the direction of stress and inflammation reduction. According to the neurobiological caregiving model, oxytocin, which reduces stress and inflammation through interaction with other hormones that regulate immunological functioning, modulates the neural circuitry behind caregiving motivation. The flow of the components of the model begins with the helper’s perception of distress, followed by recognition of need and/or vulnerability of the other individual. Subsequently, caregiving motivation is activated and acted upon. The model ends with the health and longevity benefits for the helper (for a detailed description of the model, see [29]). Regarding neural circuitry, the most important component in neurobiological caregiving model appears to be the medial preoptic area of the hypothalamus (MPOA), which is hypothesized to regulate the motivation for caregiving, in interconnection with the amygdala and other brain regions, as well as other neural and hormonal substrates (e.g., progesterone and oxytocin; [29]). The authors specify that the proposed model does not offer an all-encompassing theory of helping behavior, but rather an interpretation of other-directed motivation that can favor active helping of individuals in need.

Recent studies on the mechanisms of prosocial decisions and behaviors, such as the effects of the perceived social stress at individual level, indicate that there are situations where stress can promote prosocial behaviors, such as empathic behavior and altruism ([31]; [32]). In their multidimensional analysis of the idea that stress can lead to prosocial action in immediate need, Buchanan and Preston [33] discuss that the physiological stress response has evolved as an adaptive way to motivate behavior and release metabolic energy in acute need situations [34]. Sapolsky and colleagues [34] propose that this adaptive function is connected to the stressful experience of social living in humans, including overcrowding and exposure to the sufferance of others. Hence, stress in a social context can lead not only to aggressive reactions among individuals, but can also foster prosocial affiliative responses [33]. In line with this, Buchanan and Preston [33] present possible mechanisms for stress-induced altruistic aid- i.e. helping others in immediate need regardless of relation. These proposed mechanisms refer to the mammalian neural circuitry supporting offspring care, which largely overlap with those associated with the reward processes and motivational decisions in the mammalian mesolimbocortical system ([35]; [36]). In sum, by extending the neural system for offspring care to altruism in humans- i.e. helping unrelated others at a current cost to the helper- one might better understand the prosocial behavioral decisions of helping other people in need.

4 CONCLUSIONS

The aim of this paper was to perform a qualitative analysis of the literature in order to outline the components of the interdisciplinary Learning Objective to be included in the existing Service-Learning training curricula for academic personnel, that could facilitate not only a better understanding of the benefits of the community-oriented pedagogy, but also increase the motivation for social participation of academic staff and students. The qualitative analysis of the papers included in this review has allowed the formulation of the following LO to be added to the existing SL training curricula: SL trainees should be able to understand the neurobiological mechanisms behind the health-related benefits of helping others in need. The curricular elements that should facilitate the achievement of this LO are placed within the frame of the adaptive significance of human prosocial behavior, specifically of the tendency to help others in need. The qualitative review has allowed the identification of two main themes that are considered to support the proposed LO: (1) the neurobiological substrate of successful prosocial interactions in humans, and (2) activation of caregiving motivation in situation of helping others in need.
The emergence of coordinated activities of helping others in need, such as structured volunteering and Service-Learning, appears to be quite recent in human evolutionary history (e.g. volunteering in formal volunteer service programs date back only to the mid-1800s [37], cited in [9]). Due to the development of media, most humans are continuously exposed to suffering and threats to survival of other beings, including those who are not placed within their physical proximity, so they could offer immediate help. In conclusion, by presenting the neurobiological and evolutionary explanations of the process of helping others in need, the academic personnel enrolled a SL training have the chance to better understand that volunteering and Service-Learning (which connects community-based volunteering with education), might be one of the adaptive mechanisms evolved by humans to promote social connectedness in large groups of unrelated individuals. Such mechanisms could build and reinforce the neurocircuitry that might favor the probability of proactive social behavior at a community level [9].

REFERENCES


