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Review

The impact of certain neuropsychological disorders on residents' ability to engage in environmental education

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Abstract: Humanity is currently facing several global problems, such as global warming, air pollution, water pollution, deforestation, desertification, and land degradation, which are connected to the consequences of negative human activity. One of the possible and effective institutional tools for environmental protection is the environmental education of the general population. It is a relatively well-known and used environmental protection policy tool that governments of all developed countries have in their instrument mix. This qualitative analysis assigned itself the task of investigating whether the ability of environmental education can be affected by certain neuropsychological diseases in addition to thinking about the psychology of environmental education at large. To fulfill this main task, the authors asked themselves the following research questions: 1st—Is pedagogical psychology identical and applicable in the case of environmental education? And 2nd—What effect do some neuropsychological disorders have on the ability of environmental education? Based on the study, analysis, selection, and comparison of current professional scientific works obtained from the research activities of current researches on this topic, it is possible to accept the premise that the psychology of environmental education is basically the same as the general psychology of education and that neuropsychological diseases do indeed affect the ability of environmental education similarly to scholarly education. The main benefit of this qualitative review is the originality of the survey. There are no relevant and credible publications on the chosen topic, i.e., on the influence of selected neuropsychological diseases on the ability of environmental education of the population, to be found in the representative databases. Due to the importance of environmental education of the population, as one of the basic tools of environmental protection, the knowledge gained can gradually be incorporated into the politics, psychology, and didactics of education, to improve the technique of environmental education.

Keywords: environmental education; educational psychology; neuropsychology; neuropsychological diseases

1. Introduction

Humanity is currently facing a wide range of global problems, which are clearly the result of negative human activity (Shi et al., 2022). In terms of severity and other related problems, global warming appears to be the most serious and it is additionally associated with other global problems such as rising sea levels, melting glaciers, and the loss of organisms in ecosystems, among others (Mitchell, 2022). Individual states and some state groupings (EU) have different types of instruments in their environmental policy which they use in so-called instrument mixes for environmental protection, according to the specific environmental policy of the given state (Hájek et al., 2019). The group of environmental institutional tools also includes environmental

education of the population (Lesnikowsky et al., 2021). Several authors refer to this tool as contemporary and modern. In particular, the Nordic countries of the European Union have adopted this tool for a relatively long time and achieved very good results regarding the environmental education of the population, which logically and subsequently manifests itself in the good state of the environment (Phillips and Ertl, 2003). This work set itself the task of investigating, based on current published works, the influence of educational psychology and neuropsychology on the environmental education of residents. To fulfill this main task, the authors asked themselves the following research questions: 1) Is pedagogical psychology identical and applicable in the case of environmental education? And 2) What effect do some neuropsychological disorders have on the ability of environmental education? For these purposes, the authors carried out an extensive research activity of scientific research published on this topic. Specifically, electronic resources indexed in scientific databases Open Access, Web of Science, Scopus, and Web of Knowledge were used. Selected publications were studied, and compared by way of result comparison, and selected works were then included in the study. The basis for this publication was not our applied research, but rather a scientific research activity. Thus, this work must be marked as a review of professional literature. Due to the limited possibility of the scope of this publication—a professional article, it is not possible to include all professional literature in the research. As such, this review contains a thematically selected selection that forms a logically integrated whole.

2. Materials and methods

This chapter is divided into two sub-chapters, the first of which describes the research methods, and the second sub-chapter provides a general overview of the background of the research. Basic concepts important to research activities are explained in more detail here.

2.1. Methodology

The basic scientific method was the qualitative research activity of professional scientific publications of research carried out on the investigated issue. These publications were studied, and selected, and a mutual comparison and selection were made so that in the end it was possible to fulfill the assigned task and answer the research questions.

2.2. Basic concepts

Environmental education of the general population is one of the basic institutional tools of environmental protection. It is carried out and organized by state administration bodies and local governments, and its goal is to educate residents on environmental issues to improve and maintain the environment (Chiwpreecha et al., 2022). The leaders of environmental education in Europe are the Nordic countries, which already have a relatively long tradition in this area (Phillips and Ertl, 2003). Among European Union countries, environmental education can already be found in the institutional education of pre-school-aged children via education about the sorting of household waste, for example. In elementary schools, this education is already part

of the curriculum (Barrero García, 2020; Cohen and Bloom, 1999).

Educational psychology, also called the psychology of education, is a borderline scientific discipline that draws knowledge from psychology and pedagogy (Fojtíková Roubalová, 2018).

In Pedagogical psychology, the regularities of educational processes are investigated to apply psychological knowledge in pedagogical practice, i.e., in the teaching and upbringing of children, youth and adults (Fojtíková Roubalová, 2018).

Neuropsychology is a scientific discipline that stems from the close interdisciplinary relationship between neuroscience and psychology. It deals with the connections between the central nervous system and the human psyche, thus dealing with both behavior and experience. This field is traditionally studied from a primarily clinical point of view by analyzing the impact of brain lesions of various etiologies especially cognitive psychological processes (Kulišťák, 2003). Neuropsychology studies diseases such as dementia, Alzheimer's disease, aphasia, amnesia, ADHD, and others that have been proven to affect cognitive functions and negatively affect the ability to learn material related to environmental education (García-Campos et al., 2020; Pestun et al., 2019).

3. Results

At the beginning of the research, it is necessary to think about education in general, its institutional organization, and then about Pedagogical Psychology, i.e., about the regularities of the educational process. Subsequently, the specifics of environmental education can be sought and compared based on Pedagogical Psychology, and the theoretical influence of selected neuropsychological dysfunctions on the ability of environmental education can be explored.

In his publication, which was published in the Czech translation of Oldřich Selucký in 1998, Yves Bertrand proposes to narrow down many classifications of educational theories to these seven—spiritualistic, personalistic, cognitive-psychological, technological, socio-cognitive, social and academic (Bertrand, 1998). Due to the focus of this work, it will be appropriate for this publication to deal more significantly with cognitive psychological theory. Bertrand further states that cognitive psychological theories study the student's development of such cognitive processes as reasoning, analysis, problem-solving, creation of representations, preconceptions, mental images, etc. The foundations of these educational theories must very often be sought in cognitive psychology research by which they each cover different aspects of learning. According to this theory, the teacher must consider the learning processes and the previous knowledge of the individual learning. They must additionally find out what their models, representations, and ways of processing information are. It is also necessary to assume that this knowledge may conflict with the scientific knowledge that is learned at school (Havlíková and Bertrand, 2017).

The following two ideas are also based on this theory, which will be discussed in more detail in this work. The first of them is the educational processes of pedagogical psychology, which can be used to influence a successful cognitive process, and the second is the effect of certain neuropsychological diseases on an individual's ability to learn.

Pedagogical psychology deals with the laws of educational processes (Mareš, 2013). Daniels et al. (1996) examine the influence and possibilities of different types of upbringings and education on undesirable deviations of people. In pedagogical psychology, the personality of the pedagogue and their characteristics, knowledge, erudition pedagogical abilities, and disposition are also of fundamental importance. Research on this issue was published by Akhmetzyanova in the journal Social and Behavioral Sciences. This research focuses on the specifics of higher education and demonstrates the importance of the pedagogue in the process of university education (Akhmetzyanova, 2015). Cristea's (2015) research also brings interesting insights into the methodology of general didactics. Here, the author deals directly with the methodology of classroom management and its influence on the educational process.

The following works, following the general theory, quite significantly point to the fact that environmental education is only a subcategory of general education and is governed by the same principles and rules. Among the research published on this topic, we can mention the work of Miloevi Adamovi (2022), in which he reflects on the necessity of cooperation between parents and preschool-type facilities in the field of environmental education. Ronnen and Kerret (2020) published a study in the International Journal of Environmental Research and Public Health that examines the possibility of integrating positive psychology into environmental education. A very interesting monograph, which could fulfill the aspiration of one of the best works in Asia on the topic of environmental education with an overlap of the psychology of environmental education, was published by Fang et al. (2023) in which they examine the aspects and conditions of environmental education relevant in Asia. The subsequent works are all devoted to psychology and other issues of environmental education. Research by Konakchieva (2016) deals with the methodology of children's environmental education. In this case, it is a case study. The publication by Fang et al. (2016) examines the psychological aspects affecting pro-environmental behavior. The authors examine different models of access to undergraduate environmental education. Another work published research on the issue of the development of environmental culture among future teachers during professional training (Honcharuk, 2020). A survey of teachers' opinions on the integration of environmental education and sustainable development in primary schools was published by Pehoiu (2019). The topic of environmental education and its interpretation is also addressed in an article by Howard (1998). The correlation between teaching psychology and environmental education and sustainable development is addressed by Koger and Scott (2016). A study on motivating and guiding school-aged children to relate to nature as part of the culture of life and environmental protection was published by Audley and Stein (2017). Research based on the questionnaire method in the field of environmental design education was published by Roske (1978) and research on moderating and influencing attitudes, attitudes, and behavior towards environmental protection and recycling by Schultz and Oscamp (1996). The context of all the above-cited publications in this block, is already stated in the previous part of the thesis. Environmental education is a subcategory of general education, in which social-environmental sciences, educational psychology, and didactics are intertwined. Based on the details, it can be stated that the didactics and psychology of environmental education are essentially identical to those of general education.

The discipline in which other social sciences such as didactics, psychology, deontology, history, logic, semantics, and environmental sciences are intertwined, is environmental ethics (Kolářský and Suša, 1998). "In contrast to ethical education perceived from the perspective of a practical philosophical discipline that works with virtues, positive behavior occurs through the development of social skills—the means of psychology" (Vyvozilová, 2011). Psychology, as an applied social discipline, also extends to philosophical ethics, especially as a tool for knowing the motivation and behavior of an individual in the decision-making process when accepting an ethical judgment. Its use is also quite evident in the way of thinking brought about by the descriptive method of ethics (Klimsza, 2013). Based on the previously mentioned ideas, it is possible to document the overlap of educational psychology with environmental education and the associated use of psychology in ethics itself and its subcategory—environmental ethics, or ethics of life sciences.

The following part of the research is devoted to some neuropsychological diseases and their influence on the individual's abilities in the educational process, and conversely, the possibility of the benefit of education in a positive effect on some types of neuropsychological diseases. For example, the following studies were published on the topic of the possible contribution of the educational process to neuropsychological diseases: Cavaco et al. (2015) examines the influence of the educational effect in patients with advanced sclerosis, and Klepac and Trkulja (2009), which deals with the effect and possibilities of education in patients with Parkinson's disease of the non-demented type to reduce depression and increase their quality of life. Pavlik et al. (2006) published research on the effect of premorbid IQ and education on the progression of Alzheimer's disease. The above-mentioned studies point to the positive influence of education on the state and course of some neuropsychological diseases. In this case specifically on sclerosis, Parkinson's disease, Alzheimer's disease, and incipient psychoses. The following part of the research examines the problem from the reverse point of view and will focus on publications that deal with the limiting effects of some neuropsychological diseases on the educational abilities of an individual.

Research that dealt with aspects of education for late-life dementia and Alzheimer's patients was published by Kovacich et al. (2006). McDowell et al. (2007) then deal with sessions and educational opportunities for patients affected by dementia. The publication published by Sobral and Paúl (2013) directly examines the extent of the possibility of educating patients with Alzheimer's disease. The relationships between education, cognitive functions of the brain, and Alzheimer's disease are also investigated by Honjo et al. (2022) using an inventory neuropsychological questionnaire. They also take age and level of education into account. Similar topics are addressed by Groot et al. (2022) and in their research, they deal with the relationships of education and intracranial volume with cognitive trajectories and mortality rates in the continuum of Alzheimer's disease. Wang et al. (2022) then published a study in which they deal with the possibilities of reading in cognitive deficits caused by Alzheimer's disease. Research examining the relationship between cognitive function and mortality in a population-based sample of older citizens, stratified by gender and education. Sotsky (2022) deals with the effects of Lyme disease in psychiatry, its symptoms, the state of cognitive functions, and educational opportunities. Foucard et al. (2021) then examine short-term memory and self-learning

ability in patients affected by Alzheimer's disease. In their work, Happawana and Diamond (2022) also reflect on the relationship between learning and Alzheimer's disease, and we can also mention an interesting study by Wolters (1995) that deals with the effect of HIV in children on cognitive functions and the educational process.

4. Discussion and conclusion

A new study released by The Lancet Neurology shows that, in 2021, more than 3 billion people worldwide were living with a neurological condition. The World Health Organization (WHO) contributed to analyzing the Global Burden of Disease, Injuries, and Risk Factor Study (GBD) 2021 data. The overall amount of disability, illness, and premature death (known as disability-adjusted life years, DALYs) caused by neurological conditions has increased by 18% since 1990 (WHO, 2024). Based on the above, it can be illustrated that the number of neuropsychological diseases is rising, and with this increase, the importance of research into the effect of this type of disability on the ability to further education, including environmental education, is also increasing.

The systematic review focused on the connection between the psychology of environmental education and general education, as well as the potential impact of certain neuropsychological diseases on environmental education opportunities.

In all representative databases, enough relevant sources were found that deal with research on the topic of educational psychology and the influence of selected neuropsychological diseases on educational ability. It can be stated that no relevant research was found on the psychology of environmental education and the influence of neurological diseases. However, the method of logical deduction can be used, and if we accept the premise that environmental education is only a subcategory of general education, we can, based on published research, apply general knowledge to a specific category of education, in this case to the environmental education of residents. We also must state that no other published review of the professional literature was found in the conducted research, which would examine the issue of the influence of neuropsychological diseases on the ability of environmental education. Among the published reviews on the topic of neuropsychological diseases and education, one can find systematic expert reviews on cognitive function training in neurological diseases, such as the systematic review by Fava-Felix et al. (2022) or a review by Rodrigues (2019). Contrarily, the possibility of educating patients with neuropsychological diseases is dealt with in systematic reviews by authors Dias Bernardo (2018) or Tarver et al. (2004). As part of the comparison with the reviews mentioned above, it can be stated that in all cases, these are systematic reviews that deal with the relationship of cognitive function training to the course and state of neuropsychological diseases, or conversely, the possibility of education in neuropsychological diseases.

As mentioned in the previous section, the primary advantage of this qualitative review is the originality of the survey. There are no relevant and credible publications on the chosen topic, specifically on the influence of selected neuropsychological diseases on the ability of environmental education for the population, that can be found in the representative databases. We can accept the premise that as time progresses, more works on this topic will become available and mutual comparison of the achieved

results will be possible. Due to the importance of environmental education of the population, as one of the basic tools of environmental protection, the knowledge gained can gradually be incorporated into the politics, psychology, and didactics of education, to improve the technique of environmental education. Of course, it can be argued that neuropsychological diseases affect only a small fraction of the population, however, some diseases are already observed in children of preschool age, and with the progress of medicine, the life expectancy and the need for education for older citizens are also increasing.

It can be qualifiedly estimated that with increasing research on the topic of the influence of neuropsychological diseases on the ability of environmental education of the population, over time there will be more relevant works in representative databases, and it will be possible to update this presented review.

This review has set itself the task of reflecting on the psychology of environmental education based on research activity and among published research—professional articles and e-books to explore the relationship between neuropsychological diseases and environmental education. To fulfill this research task, we asked ourselves the following research questions: 1) Is pedagogical psychology identical and applicable also in the case of environmental education? And 2) "What effects do certain neuropsychological disorders have on the ability to engage in environmental education?"

Based on the review, it can be concluded:

1st—Environmental education is a subcategory of general education.

2nd—Pedagogical psychology can also be applied in environmental education.

3rd—Neurological diseases affect the possibility of educating people, which also applies to the possibility of environmental education.

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