ASERS

Journal of Environmental Management and Tourism

Quarterly
Volume XIV
Issue 5(69)
Fall 2023
ISSN 2068 – 7729
Journal DOI
https://doi.org/10.14505/jemt

ASERS Publishing

Fall 2023
Volume XIV
Issue 5(69)

ASERS Publishing
http://www.aserspublishing.eu
ISSN 2068 – 7729
Journal DOI: https://doi.org/10.14505/jemt

Table of Contents:

Fall 2023
Volume XIV
Issue 5(69)

ASERS Publishing
http://www.aserspublishing.eu
ISSN 2068 – 7729
Journal DOI: https://doi.org/10.14505/jemt

Call for Papers
Winter Issues 2023
Journal of Environmental Management and Tourism

Journal of Environmental Management and Tourism is an open access, peer-reviewed interdisciplinary research journal, aimed to publish articles and original research papers that contribute to the development of both experimental and theoretical nature in the field of Environmental Management and Tourism Sciences. The Journal publishes original research and seeks to cover a wide range of topics regarding environmental management and engineering, environmental management and health, environmental chemistry, environmental protection technologies (water, air, soil), pollution reduction at source and waste minimization, energy and environment, modelling, simulation and optimization for environmental protection; environmental biotechnology, environmental education and sustainable development, environmental strategies and policies.

Authors are encouraged to submit high quality, original works that discuss the latest developments in environmental management research and application with the certain scope to share experiences and research findings and to stimulate more ideas and useful insights regarding current best-practices and future directions in Environmental Management.

Also, this journal is committed to a broad range of topics regarding Tourism and Travel Management, leisure and recreation studies and the emerging field of event management. It contains both theoretical and applied research papers and encourages obtaining results through collaboration between researchers and those working in the tourism industry.

The journal takes an interdisciplinary approach and includes planning and policy aspects of international, national and regional tourism as well as specific management studies. Case studies are welcomed when the authors indicate the wider applications of their insights or techniques, emphasizing the global perspective of the problem they address.

This issue has a special importance for us, marking a new stage in the history of this journal. So, starting with Issue 5(69), Fall 2023 **Journal of Environmental Management and Tourism** will be published in Open Access system. Journal of Environmental Management and Tourism' articles are published under the Creative Commons Attribution 4.0 International License BB CY, which permits unrestricted use, distribution, and reproduction in any medium, provided the original authors and the source are credited.

Journal of Environmental Management and Tourism is indexed in SCOPUS, RePEc, CEEOL, ProQuest, EBSCO and Cabell Directory databases.
Details regarding the publication in this journal are here: https://journals.aserspublishing.eu/jemt/about

Deadline for submission:	21st October 2023
Expected publication date:	December 2023
Website:	https://journals.aserspublishing.eu/jemt
E-mail:	jemt@aserspublishing.eu

To prepare your paper for submission, please see full author guidelines in the following file:

JEMT_Full_Paper_Template.docx, then send it via email at jemt@aserspublishing.eu.

DOI: https://doi.org/10.14505/jemt.v14.5(69).17

Analysis of the Environment Impact on the Inclusion of Children with Special Educational Needs

Marzhan TURLUBEKOVA
Karaganda University of Kazpotrebsoyuz, Kazakhstan
ORCID: 0000-0002-7609-1450
bestielts@mail.ru

Valeriy BIRYUKOV
Abylkas Saginov Karaganda Technical University, Kazakhstan
ORCID: 0000-0003-2712-8840; SCOPUS ID: 56658394100
v.biryukov@kstu.kz

Zulfiya MAGRUPOVA
Abylkas Saginov Karaganda Technical University, Kazakhstan
ORCID: 0000-0001-8190-5757; SCOPUS ID: 6508023810
mzm68@mail.ru

Galiya KISHIBEKOVA
St. Petersburg Humanitarian University of Trade Unions, Almaty, Kazakhstan
ORCID: 0000-0002-6491-6937 SCOPUS ID: 57191429717
kishibekova@mail.ru

Roza BUGUBAYEVA
Karaganda University of Kazpotrebsoyuz, Kazakhstan
ORCID: 0000-0002-3648-8365; SCOPUS ID: 57195346665
roza.bugubayeva@bk.ru

Article info: Received 22 May 2023; Received in revised form 17 June 2023; Accepted for publication 19 July 2023; Published 1 September 2023.

Abstract: This paper highlights the critical role of the environment in facilitating the inclusion of children with special education needs (SEN) in educational settings. The physical environment, social interactions, curriculum, instructional practices, and policy frameworks all contribute to creating an inclusive environment. Considering and addressing the impact of these environmental factors, educators, policymakers, and school leaders can promote the successful inclusion and participation of children with SEN, ultimately enhancing their educational experiences and outcomes. Further research is needed to delve deeper into specific environmental factors and their interrelationships to develop comprehensive strategies for promoting inclusive education.

Keywords: pollution; environment; inclusive environment; inclusive education; education system.

JEL Classification: Q52; I25; Q56; Q57; R11.

Introduction

A favorable environment is an environment whose condition ensures environmental safety and protection of public health, conservation of biodiversity, prevention of pollution, sustainable functioning of ecological systems, reproduction and rational use of natural resources. Environmental factors play a vital role in the support and development of children with special educational needs, which include the physical, social and behavioral characteristics surrounding the child, as defined by the International Classification of Functioning, Health and Disability (ICF) (Anabi *et al.* 2018).

Analysis of the factors influencing inclusive education is an important task for understanding and improving the educational system includes an assessment of how the environment and environmental factors can facilitate or create barriers to the successful integration of these children into the educational environment. Here are some aspects to consider in such an analysis:

- Physical accessibility. The environment must be accessible to all children, including those with physical disabilities. The availability of suitable infrastructural conditions, such as adapted buildings, accessible ramps, elevators, wide doorways, etc., allows children with special education needs (SEN) to move freely within educational institutions;
- Healthy and safe learning and living environment. The quality of the environment plays an important role in ensuring the comfort and safety of children with SEN. This includes the availability of clean air, safe drinking water, proper waste management, and physical safety in classrooms and school buildings;
- Accessibility of educational resources. Environmental factors can influence the availability and access to educational resources for children with SEN. This includes the availability of special educational materials, technologies and equipment, as well as access to information technology and the Internet;
- Natural environment and environmental education. Diverse natural environments such as parks, gardens, ecological reserves, etc. can provide unique opportunities for inclusive education. The development of environmental education programs that include children with SEN and encourage their participation in activities related to nature, promotes their integration and positive interaction with the environment.

Despite a growing body of evidence on environmental impacts on child participation, little is known about the environmental barriers faced by preschool children with disabilities in Taiwan. Knowledge of environmental barriers will help develop environmental modification solutions or strategies to support children's access to and participation in daily activities (Kang *et al.* 2018)

1. Literature Review

The impact of environmental pollution cannot but affect human health. The most vulnerable groups of the population to harmful effects are pregnant women and children. The problem of the influence of harmful environmental factors on the health of children in Kazakhstan has been studied since the 90s, however, there are only a few works devoted to the study of the impact of harmful substances on children with special education needs (SEN).

Every child deserves to learn in an environment adapted to their specific needs. Inclusive education offers a wide range of benefits, from social and emotional to academic achievement.

There are numerous studies that have shown that inclusive education has its benefits in terms of the cognitive, social and emotional development of persons, arguing that inclusive education provides more opportunities for the development of social, emotional and behavioral skills not only in children who need additional support, but also in children with typical development (Magyar *et al.* 2020, Molina Roldán *et al.* 2021, van Kessel *et al.* 2021). Some studies show that students who have not experienced problems have positive attitudes, positive beliefs and a willingness to accept students with disabilities, along with a positive attitude towards co-education with them, which is a very important factor for successful inclusion (Radisavljevic-Janic*etal.*2018, Alnahdi and Schwab 2021).

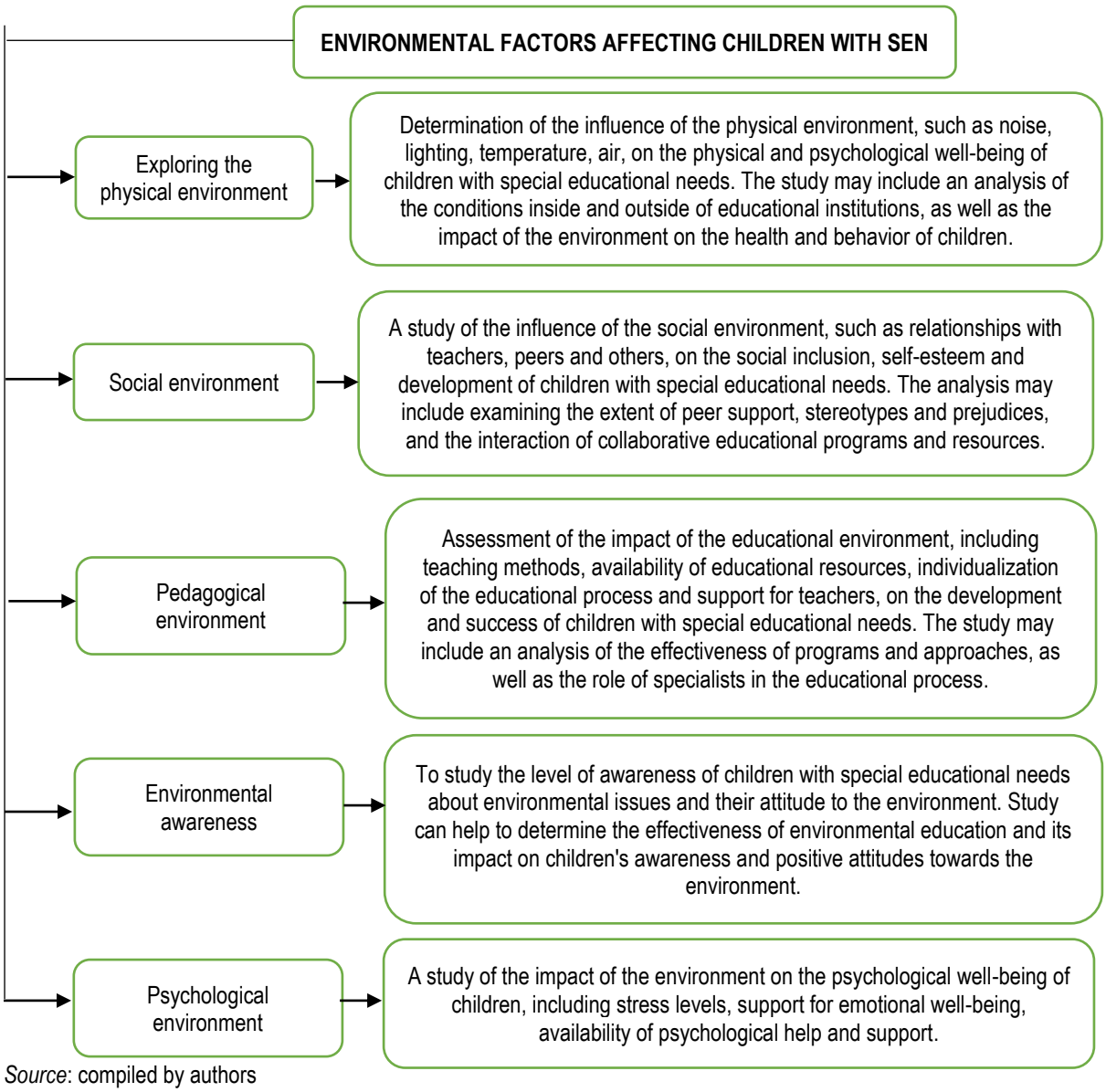
Changes in educational policy bring many positive results, avoiding discrimination of children with SEN (Artiles *et al.* 2020), creating equal opportunities in education, having some academic success (Gregorz *et al.* 2018), improving communication and social interaction. However, in reality, these benefits can be reduced due to various barriers in the educational environment, for example, the reluctance of some teachers, peers, parents or leaders to include these children in the educational process (Sedláčková *et al.* 2021).

The experience of students with different types of special educational needs (SEN) within the framework of inclusive education (IE) has been studied and repeatedly described in the literature by foreign scientists (Okyere *et al.* 2019, Sedláčková 2018).

Greenberg and Nielsen (2018) and Mitchell (2019) note that education systems can become places where collaboration, creativity, problem solving, communication, and critical thinking take place among diverse populations if they are truly inclusive. These end goals are qualitatively different from those at the heart of the placement debate, but are key to the evolution of inclusion because, as noted by Nikolić and Popović (2018) and Peters (2019), a child can be present in a regular school without actually being included in it. For many European countries, according to Meijer and Watkins (2019), changing the financing systems for inclusive education can still be considered as a key lever to achieve the goal of wider coverage of students with special educational

needs. The key guidelines of state support and directions of financial assistance in European countries are reflected in the series of documents (Lemechshenko *et al.* 2022).

Figure 1. Environmental factors affecting children with SEN



Source: compiled by authors

The quality of the development of inclusive education raises many questions from researchers, including the inefficiency of the use of innovative forms of education in inclusive education, insufficient knowledge of international experience, and the impact of the environment. Environment can have both direct and indirect effects on children with special educational needs (SEN). Here are some ways that environmental factors can affect children with SEN:

- Health and well-being: Poor environmental quality, such as air pollution, water or soil, can negatively affect the health of children, including those with SEN. They may be more vulnerable to pollutants and be more sensitive to adverse environmental conditions.
- Accessibility and facilities: Some natural and public spaces may not be accessible or adequate for children with SEN. For example, the lack of accessible ramps, elevators, or accessible facilities can make it difficult for children with disabilities to get around and participate in activities.
- Social inclusion: Environmental factors may influence the opportunities for social integration of children with SEN. The inaccessibility or lack of adapted environments for play and interaction in the natural environment may limit the ability of children with SEN to participate in activities and interact with other children.

- Environmental education: The development of environmental education programs that include children with SEN can promote their active participation and education. Such programs can help children with SEN develop environmental awareness, participation in environmental projects, and a positive attitude towards the environment.
- Environmental support and adjustment: It is important to provide appropriate environmental support and adjustment for children with SEN. This may include adapted teaching materials, equipment and technology.

All these problems together require the solution and the combined efforts of all stakeholders and an integrated approach for its successful implementation in the country (Nurgalieva *et al.* 2018). As part of the study of environmental factors affecting children with special educational needs, there are certain tasks (Figure 1).

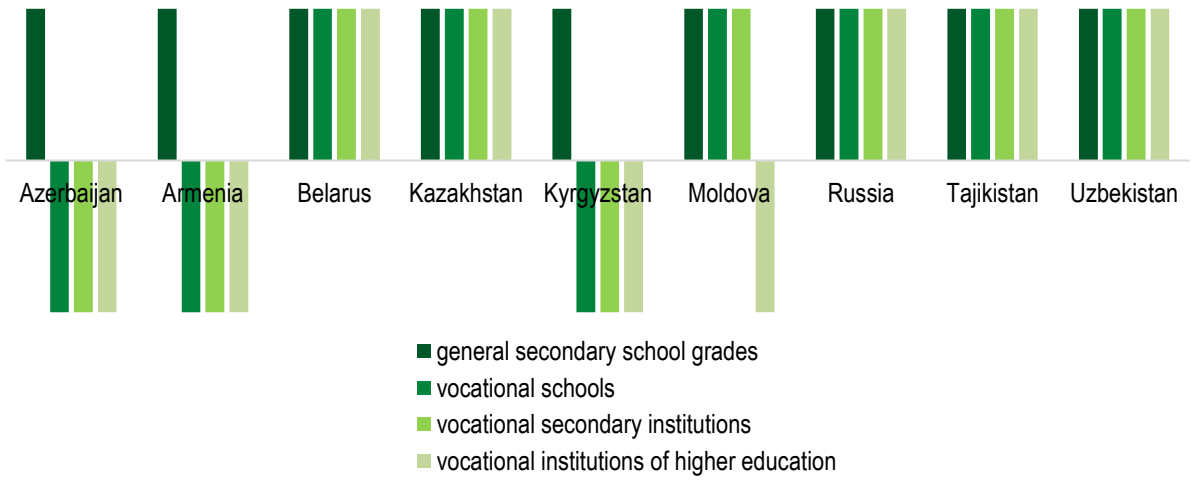
In this context, research related to the impact of the environment on the health and behavior of children with SEN will help identify key issues and offer recommendations for creating a supportive and supportive environment that promotes their health, development, and learning. The study of the influence of the environment on the formation of patterns of behavior and lifestyle of children includes an analysis of the availability of healthy food, opportunities for physical activity, environmental education and attraction to nature. Research into policies and programs aimed at creating a healthy and safe environment for children with SEN may include the effectiveness of existing interventions and suggestions for improving policies and programs at the community, school or state level.

2. Research Methodology for Influence of Environment upon Inclusive Education

The adoption of the UN Convention on the Rights of Persons with Disabilities approved the principles on which the state policy towards persons with disabilities should be built (UN Convention). In some Commonwealth countries, the "accessible environment" program has been adopted and is being successfully implemented, the purpose of which is to create conditions for a full life and integration into society of people with disabilities and other people with limited mobility. But, as cross-country analysis shows, conditions for inclusive education have not been created everywhere.

In accordance with Article 24 of the Convention, paragraph 1 “States Parties recognize the right of persons with disabilities to education. In order to realize this right without discrimination and on the basis of equality of opportunity, participating States shall ensure inclusive education at all levels and lifelong learning”. What you can’t really say, since the data indicate that there are certain problems in the coverage of inclusive education for children with disabilities and children with disabilities (Figure 2).

Figure 2. Educational institutions that have created conditions and ensured barrier-free access for the education of persons with disabilities



Source: compiled by authors according to https://www.cisstat.org

According to statistics, the number of registered disabled people in the Republic of Kazakhstan and children covered by inclusive education indicates that a fairly large number of parents of disabled children do not consider it necessary to develop, let alone educate a child. If we considered in the regional aspect, the number of

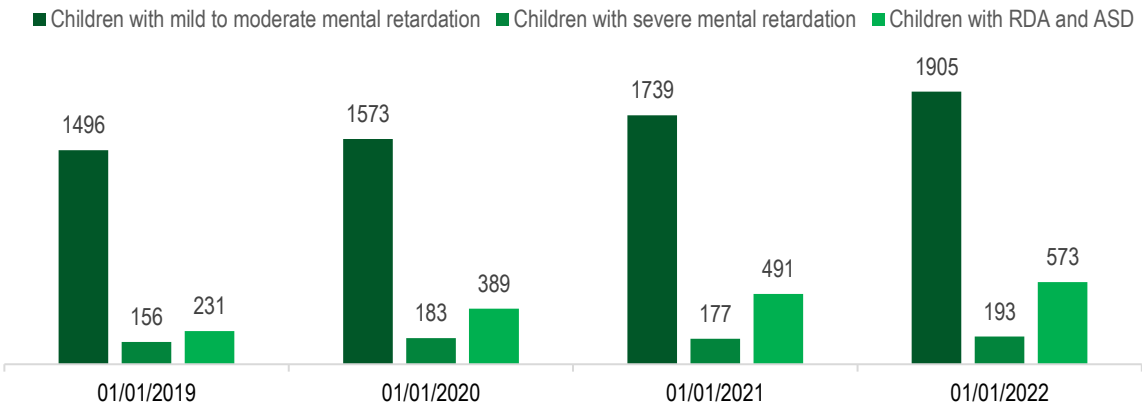
registered disabled children under 18 years of age has a certain upward trend, especially in such regions as the Almaty region, Turkestan, East Kazakhstan, Almaty, Astana. Some regions of Kazakhstan are known for their environmental problems, which can affect the health and behavior of children with SEN. Here are a few regions that may be affected:

- Karaganda region. This region is characterized by a developed industry, including metallurgical and chemical enterprises. Emissions and pollution associated with this industry can have a negative impact on the environment and the health of children, including children with SEN.
- East Kazakhstan region. The region is characterized by the presence of extractive industries, including the extraction of minerals such as coal and uranium. This may be accompanied by emissions of pollutants and negative impact on the environment.
- Akmola region. The capital of Kazakhstan, Nur-Sultan, is located in this region, which is a major center of industry, transport and infrastructure. A high level of motor transport and industrial enterprises can lead to air pollution and affect the health of children.
- West Kazakhstan region. The region is characterized by the presence of oil producing and oil refining industries. The emissions and pollution associated with this industry can have a negative impact on the environment and children's health.

Undoubtedly, the influence of ecology pays great attention to the development of children, and due to the fact that the ecological situation in the regions of Kazakhstan is deteriorating, the number of children with various degrees of disability increases every year. The existing practice of socialization of children with special educational needs at the moment in Kazakhstan is not sufficiently developed. This weakens the social position of the child and exacerbates his unequal social status. Despite the numerous government measures aimed at resolving this situation, the problem of unequal access to education in Kazakhstan exists and requires targeted action. This is evidenced by data characterizing the number of children with disabilities from 0 to 17 years old, including the number of children covered by inclusive education. Also, the influence of the environment has on such types of deviations as:

- mild and moderate mental retardation;
- severe and profound mental retardation;
- children with RDA and ASD (Figure 3 and Figure 4).

Figure 3. Total number of children with severe disabilities caused by environmental degradation



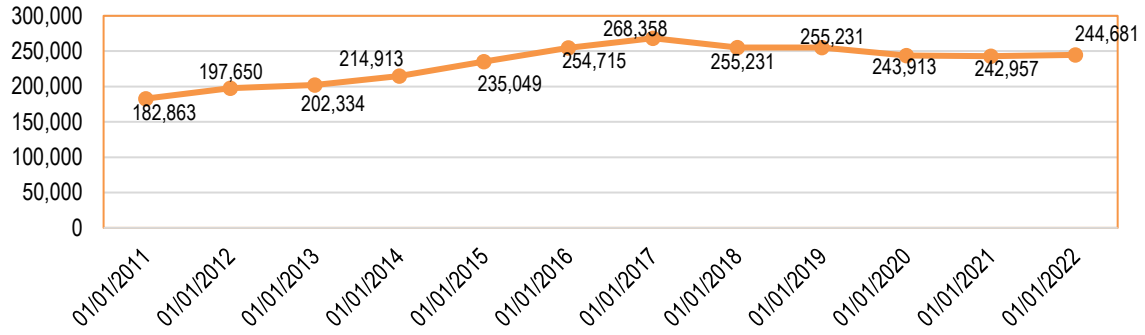
Source: compiled by authors according to https://www.stat.gov.kz

An increase in the number of stationary sources of pollution can lead to a number of negative consequences for the environmental situation. Here are some of them:

- Air quality deterioration: Stationary pollution sources such as industrial plants, power plants and factories can emit harmful substances and pollute the air. This can lead to an increased content of toxic gases, aerosols and other pollutants in the atmosphere, which adversely affects human health, flora and fauna.
- Water pollution: Some stationary sources of pollution may release waste and industrial effluents into water resources such as rivers, lakes and seas. This can lead to water pollution with toxic substances, oil products, chemicals and other harmful substances, which negatively affects the ecosystems of aquatic organisms and can cause problems for drinking water supply.

- Loss of biodiversity: The expansion of stationary sources of pollution can lead to the destruction and loss of natural habitats for many species of animals and plants. Environmental pollution can disrupt ecological balances, reduce populations and alter the biodiversity of a region.
- Adverse health impacts: An increase in stationary sources of pollution can increase the risk of disease in people living near such sources. Emissions of pollutants can cause problems with the respiratory and cardiovascular systems, as well as contribute to the development of cancer and other chronic diseases.
- Climate impact: Some stationary sources of pollution, especially those associated with energy, can contribute to the release of greenhouse gases such as carbon dioxide (CO_2) into the atmosphere. This can lead to an increase in the greenhouse effect and changing climatic conditions, such as global warming, changing weather patterns and other climate changes.

Figure 4. Number of stationary sources of pollution, units



Source: compiled by authors according to https://www.stat.gov.kz

In general, the increase in the number of stationary sources of pollution can lead to serious environmental problems that require the adoption of appropriate measures to control and reduce pollution, as well as to switch to more environmentally sustainable and cleaner sources of energy and production. It should also be noted that investments are required aimed at protecting the environment by types of environmental activities (Table 1).

Table 1. Investments aimed at protecting the environment by types of environmental protection activities, thousand tenge

Indicator	01.01.2019	01.01.2020	01.01.2021	01.01.2022
Investments aimed at protecting the environment	111.161.429	198.721.626	173.618. 612	171.165.359
including:				
- protection of atmospheric air and the problems of climate change	10.333.129	11.008.007	15.426.845	8.046.476
- wastewater treatment	6.179.506	2.909.014	11.775.069	31.016.559
- waste management	7.541.510	9.069.412	11.151.011	14.408.303
- protection and rehabilitation of soil, groundwater and surface water	9.882.630	8.775.234	7.108.863	10.485.558
- to reduce noise and vibration impact	16.584	x	-	x
- for biodiversity and habitat conservation	3.573.298	4.154.484	5.236.991	755.868
- for radiation safety	90.958	x	34.392	149.142
- for research work	323.022	82.229	475.202	327.785
- to other areas of environmental protection related to the "green economy"	73.220.792	162.722.471	122.410.239	105.952.068
of them:				
- investments in renewable energy sources	70.941.690	162.448.828	114.218.620	98.901.557
- investments in energy-saving technologies and energy efficiency	1.793.464	234.749	5.959.183	4.833.394
- investments aimed at reducing greenhouse gas emissions	105.610	399.190	65.385	31.988

Source: compiled by authors according to https://www.stat.gov.kz

Tighter environmental taxation can have a positive effect on improving the environment (Table 2).

Table 2. The indicators of environmental taxation (ET)

Type of ET	Unit	01.01.2017	01.01.2018	01.01.2019	01.01.2020	01.01.2021	01.01.2022
Energy taxes	thousand tenge	849052365,6	1213029733,2	1654232346,1	1706402804,8	881692071,6	1192382808,8
Transport taxes		50494764,9	64334 011,1	72060 566,9	78318 677,5	63439 188,2	77638335,0
Pollution taxes		67216275,7	72528 707,3	87125 547,6	100809 615,2	85593 121,1	110934387,7
Resource taxes		182369080,1	284612 858,7	335135 667,3	394415 327,2	359187 842,0	487890932,2
Total ET		1149132486,3	1634505310,4	2148554128,0	2279946424,8	1389912223,0	1868846463,7
Share of environmental taxes in GDP							
Energy taxes	in %	1,8	2,2	2,7	2,5	1,2	1,4
Transport taxes		0,1	0,1	0,1	0,1	0,1	0,1
Pollution taxes		0,1	0,1	0,1	0,1	0,1	0,1
Resource taxes		0,4	0,5	0,5	0,6	0,5	0,6
Total ET		2,4	3,0	3,5	3,3	2,0	2,2
Structure of environmental taxes							
Energy taxes	in % to total	73,9	74,2	77,0	74,9	63,4	63,8
Transport taxes		4,4	3,9	3,4	3,4	4,6	4,2
Pollution taxes		5,8	4,4	4,1	4,4	6,2	5,9
Resource taxes		15,9	17,4	15,6	17,3	25,8	26,1
Total ET		100,0	100,0	100,0	100,0	100,0	100,0

Note: ET- environmental taxes.
Source: compiled by authors according to https://www.stat.gov.kz

Here are some arguments supporting the need for tougher environmental taxation:

- Promoting environmentally responsible behavior. Higher taxes on pollution and emissions can provide incentives for businesses and individuals to reduce their negative environmental impact. This may encourage the development and implementation of cleaner technologies, energy efficient solutions and environmentally sustainable practices.

- Reduce pollution and emissions. Increased taxation can provide a financial incentive for companies and individuals to reduce pollution and emissions. Higher taxes on emissions encourage businesses to reduce their emissions or switch to cleaner technologies, which in turn reduces their negative environmental impact.

- Financing of environmental projects and programs. Additional funds received from environmental taxation can be used to finance environmental projects and programs, such as the development of renewable energy sources, the protection of natural reserves, the restoration of ecosystems and other initiatives that contribute to the improvement of the environment.

- Social responsibility and justice. Tighter environmental taxation can contribute to a more equitable distribution of environmental responsibility. Companies and individuals that pollute the environment more will pay more taxes, which is in line with the polluter pays principle. This can contribute to a more even distribution of the environmental burden.

Tightening environmental taxation can be one of the tools to help reduce the negative impact of human activities on the environment and promote the transition to more environmentally sustainable practices and technologies. However, such measures need to take into account economic, social and political dimensions in order to ensure the equity and sustainability of such changes. Despite the fact that there are regions where the largest number of disabled children is observed, in general, the situation in the development of inclusive

education has a negative trend. According to the data presented in Table 1, we observe an annual increase in children not covered by the right to develop inclusive education. This circumstance is facilitated by certain factors, among which are:

- lack of awareness of programs for the development of inclusive education in rural areas and villages;
- lack of interest of parents in the development and education of children with disabilities;
- insufficient subsistence level of the quality of life of parents of children with disabilities;
- insufficient state funding for children with disabilities and children with disabilities.

Analyzing Tables 1-3, in different regions of the Republic of Kazakhstan there is a certain number of benefits for disabled children ("+" / "-"), due to the fact that in some areas the industry is most developed, which has an adverse impact on the environment and public health (see Table 3)

Table 3. Impact on the environment and public health

Year	Republic of Kazakhstan		Almaty		East Kazakhstan		Karaganda		Turkestan		Astana	
	CD	Avg. SDA, tenge	CD	Avg. SDA, tenge	CD	Avg. SDA, tenge	CD	Avg. SDA, tenge	CD	Avg. SDA, tenge	CD	Avg. SDA, tenge
2011	149.043	14.863	7.597	15.009	12.309	15.139	12.547	14.973	41.525	14.559	5.126	15.007
2012	151.216	16.172	8.732	16.321	12.420	16.448	13.589	16.263	40.130	15.860	5.737	16.318
2013	148.652	17.310	9.767	17.476	12.322	17.642	13.484	17.411	35.819	16.956	6.228	17.420
2014	138.513	18.543	9.222	18.630	11.369	18.916	11.120	18.607	33.445	18.224	7.125	18.689
2015	141.952	20.753	10.061	20.799	12.651	21.157	11.035	20.822	32.415	20.443	7.927	20.909
2016	141.821	22.192	9.966	22.241	13.914	22.629	10.808	22.236	30.023	21.893	8.504	22.326
2017	144.783	29.684	10.527	29.700	15.208	30.223	8.904	29.677	28.362	29.333	9.297	29.836
2018	147.396	31.695	11.085	31.682	14.901	32.276	8.987	31.630	28.661	31.337	7.874	31.891
2019	153.230	39.897	11.914	39.837	14.998	41.613	11.183	39.523	20.051	39.142	7.557	40.023
2020	161.156	41.801	13.255	41.723	15.733	43.621	11.672	41.351	19.149	41.057	9.065	41.957
2021	161.826	46.011	14.579	46.036	15.528	48.080	12.879	45.428	19.475	45.150	11.453	46.242
2022	175.082	58.656	15.600	58.601	15.217	58.650	14.091	57.967	21.361	57.966	13.597	54.062

Note: CD- Children with disabilities; SDA – social disability allowances.
Source: compiled by authors according tohttps://www.stat.gov.kz

Accordingly, in these areas there is an increase in congenital diseases that have led to disability and limited opportunities. Among the possible causes and risk factors affecting congenital and acquired disability in children, a special place should be attributed to environmental pollution. Every year, a huge number of pollutants is emitted into the atmosphere, including from stationary sources, and hazardous waste is generated.

Table 4. Dynamics of the considered indicators

Year	Number of registered disabled children under 18, in people	Air emissions of pollutants from stationary sources, in thousand tons	Hazardous waste generation, thousand tons
01.01.11	49.349	168.712	303.117,0
01.01.12	61.196	182.863	420.668,3
01.01.13	65.844	197.650	355.952,5
01.01.14	69.111	202.334	382.214,3
01.01.15	72.574	214.913	337.414,8
01.01.16	75.712	235.049	251.565,6
01.01.17	79.662	254.715	151.390,1
01.01.18	83.462	279.997	126.874,6
01.01.19	86.956	278.911	149.962,4
01.01.20	91.573	262.716	180.506,7
01.01.21	94.660	266.703	211.051,8
01.01.22	97.745	240.751	42.090,0

Source: compiled and calculated by authors

Let us put forward and test a hypothesis about the existence of a relationship between the indicator "Number of registered children with disabilities under 18 years old, pers." and the following factors:

- atmospheric emissions of pollutants from stationary sources, thousand tons;
- generation of hazardous waste, thousand tons.

To test the hypothesis, we use the correlation-regression analysis. The statistics used for the analysis are presented in Table 4.

The results of the regression analysis applied to the growth rates of the initial data show that there is a statistically significant and reliable relationship between the considered indicators (Table 5).

Table 5. Growth rates of the considered indicators

Year	Number of registered disabled children under 18, %	Air emissions of pollutants from stationary sources, %	Hazardous waste generation, %
01.01.12	24,007	8,388	38,781
01.01.13	7,595	8,086	-15,384
01.01.14	4,962	2,370	7,378
01.01.15	5,011	6,217	-11,721
01.01.16	4,324	9,369	-25,443
01.01.17	5,217	8,367	-39,821
01.01.18	4,770	9,926	-16,194
01.01.19	4,186	-0,388	18,197
01.01.20	5,310	-5,807	20,368
01.01.21	3,371	1,518	16,922
01.01.22	3,087	5,805	3,446

Source: compiled and calculated by authors

The results of data approximation using the least squares method are presented in Table 6.

Table 6. Results of data approximation

R	0,855
R^2	0,731
Adjusted R^2	0,654
Fisher test	9,508 (p – value = 0,010)
Variables	
Growth rate in the number of registered disabled children under 18, % - dependent variable	
Constant	2,291
Growth rate of air emissions of pollutants from stationary sources, %	0,989***
Growth rate of hazardous waste generation, %	0,244***
* p<0,1; ** p<0,05; *** p<0,01	

Source: compiled and calculated by authors

Analysis of the obtained parameters of the multiple linear regression equation allows us to draw the following conclusions:

- an increase in the growth rate of emissions of pollutants into the atmosphere from stationary sources by 1% will contribute to an increase in the growth rate of the number of registered children with disabilities by an average of 0.989%.

- an increase in the growth rate of hazardous waste generation by 1% will contribute to an increase in the growth rate of the number of registered children with disabilities by an average of 0.244%.

Thus, the hypothesis put forward by the author about the impact of atmospheric emissions of pollutants and the formation of hazardous waste on the number of registered children with disabilities is confirmed. This hypothesis confirms that patterns of disability in a given country are influenced by trends in the development of pathological conditions, as well as trends in the development of environmental factors. It becomes obvious that the current legislation of the Republic of Kazakhstan focuses on violations of the functions of the human body as the main cause of disability (without taking into account environmental and social factors), but with special attention to the issues of correction, restoration of impaired functions.

Taking into account international recommendations on the need to switch to new standards for measuring disability, the Ministry of Health and Social Development of the Republic of Kazakhstan is currently carrying out appropriate work to amend and improve legal and by-laws in order to reflect the biopsychosocial model underlying the ratified Convention on the Rights of Persons with Disabilities.

Thus, the tasks of developing inclusive education include identifying the driving force behind the social development of different children (young people) included in a single space of educational activities, determining indicators and criteria that allow evaluating the results of development, the level of adaptation of a “special person” to life in society. Identification of the patterns of human development in the context of inclusive education, the role of the environment of an inclusive class (a group of a preschool institution or a university) in the formation of a personality, in the development of a child's intellectual experience of educational activities, the experience of social interaction can play a decisive role in introducing the ideas of inclusion into the work of educational organizations (Akhmetova *et al.* 2018).

Increasing emissions of pollutants into the atmosphere is undesirable from a public health point of view. There is a significant amount of research that demonstrates the negative impact of air pollution on various aspects of children's health, including respiratory diseases, allergies, asthma, developmental delay and other problems.

In order to ensure the health and well-being of children, it is necessary to strive to reduce emissions of pollutants into the atmosphere and take measures to improve the quality of the environment. This includes:

- application of modern technologies and methods for cleaning emissions,
- development of effective standards and regulations for pollutants,
- conscious consumption and use of resources, taking into account environmental consequences.

It is important to note that addressing the health of children with SEN and the environment is complex and requires the cooperation of various stakeholders, including government agencies, scientific and research institutions, public organizations and society as a whole.

Conclusion

Environmental factors, including air pollution, water pollution, increasing amounts of chemicals and climate change, are becoming increasingly important for protecting the health of children as the most vulnerable group. Approaches are being developed to protect children's health from environmental harm within the framework of international human rights processes, including the international legal regime of the Convention on the Rights of the Child, the activities of specialized organizations on the issue of human rights obligations regarding the use of a safe, clean, healthy and sustainable environment.

The analysis demonstrates that the environment significantly impacts the inclusion of children with special educational needs. The physical environment must be accessible and conducive to their learning and participation. The social environment should foster acceptance, positive peer relationships, and reduce barriers to inclusion. The instructional environment must be adaptable, utilizing differentiated instruction and inclusive teaching practices. Additionally, involving parents and the community enhances the overall support system for inclusive education.

The development and implementation of strategic environmental programs aimed at reducing the rates of children with special educational needs (SEN) in the Republic of Kazakhstan (RK) is an important task that requires an integrated approach and cooperation of various stakeholders. Here are some possible policy measures and programs that could be implemented:

- Environmental quality monitoring: Develop and implement a system for monitoring the quality of air, water and soil, as well as other aspects of the environment that may have a negative impact on the health of children with SEN. This will allow more accurate identification of problem areas and sources of pollution.

- Air Pollution Reduction: Develop and implement strategies and programs to reduce pollutant emissions from various sources such as industry, transport and domestic heating systems. The introduction of energy efficient technologies and the use of renewable energy sources can also help reduce air pollution.
- Improving the quality of drinking water: Implementation of programs to ensure access to clean drinking water, including the construction and modernization of water supply and water treatment systems. This will reduce the risk of diseases associated with water pollution, which can have a negative impact on the health of children with SEN.
- Environmental Education and Awareness: Develop and implement environmental education programs aimed at raising awareness among children, parents, teachers and society at large of the importance of the environment for children's health and well-being. This may include conducting lessons, seminars, campaigns and other educational activities.
- Support for environmentally responsible initiatives: Encourage and support the development of environmental initiatives and projects that aim to reduce environmental pollution and create a safe and healthy environment for children with SEN. This may include financial support, assistance in the organization and promotion of such projects.

It is important to note that the successful implementation of strategic environmental programs requires the active participation of state bodies, scientific and research institutions, educational institutions, public organizations and the public in general.

Acknowledgments

We would like to thank Karaganda University of Kazpotrebsoyuz for supporting this research. We would also like to thank our colleagues who gave insight and knowledge that considerably aided the research.

Credit Authorship Contribution Statement

Marzhan Turlubekova wrote the conceptualization, investigation, formal analysis of the paper.
Valeriy Biryukov wrote the methodology and literature review according to statistics of Kazakhstan Republic.
Zulfiya Magrupova wrote the project administration which includes environmental quality monitoring, air pollution reduction, improving the quality of drinking water, environmental education and awareness, support for environmentally responsible initiatives.
Galiya Kishibekova wrote data curation and validation according to the Convention on the Rights of the Child, Statistics, https://www.cisstat.org.
Roza Bugubayeva added review and editing, visualizing, writing, funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

[1] Akhmetova, D. Z., Chelnokova, T.A., Migranova, G.V., Korvyakov, V. A., and Mukhambetov, D. G. 2018. The use of distance learning technologies for teaching people with disabilities. Almaty: AESA, 173 p.

[2] Alnahdi, G. H., and Schwab, S. 2021.Special education major or attitudes to predict teachers' self-efficacy for teaching in inclusive education. *Front. Psychol.*12. DOI: https://doi.org/10.3389/fpsyg.2021.680909

[3] Artiles, A. J., Harris-Murri, N., and Rostenberg, D. 2020. Inclusion as social justice: Critical notes on discourses, assumptions, and the road ahead. *Theory into Practice* 45(3): 260–268. https://doi.org/10.1207/s15430421tip4503_8bank.org%2Fcurated%2Fen%2F614161468325299263%2FInclusive-education-achieving-education-for-all-by-including-those-with-disabilities-and-special-education-needs

[4] Anabi, D., Lowe, M., Koster, W., Bedell, G., Hetani, M, Avery, L., and Teplicki, R. 2018. The mediating role of the environment in explaining the participation of children and youth with and without disabilities at home, in school, and in the community. *Arch. Phys. Med. Rehabil* 95: 908-917. DOI:https://doi.org/10.1016/j.apmr.2014.01.005

[5] Biktagirova, G. F., and Khitryuk, V. V. 2018. Formation of Future Pre-School Teachers Readiness to Work in the Conditions of Educational Inclusion. *International Journal of Environmental & Science Education* 11(3): 185–194. DOI: https://doi.org/10.12973/ijese.2016.302a

[6] Cobello, S. 2019. When society does not see the future – What does «disability» mean? *Journal of Educational and Science* 138(9): 153-165. DOI: https://doi.org/10.17853/1994-5639-2018-9-153-165

[7] Dyssegaard, C. B., and Larsen, M. S. 2018. Evidence of inclusion. Copenhagen: Danish Clearinghouse for Educational Research, 55 p.

[8] Giangrego, M., and Doyle, M.B. 2018. Integrazion scolastica in Italy: A Compilation of English-Language Resources. *International Journal of Whole Schooling* 8(1): 63-105.

[9] Greenberg, A.D., and Nielsen, A.H. 2018. The role of education in building soft skills: Putting into perspective the priorities and opportunities for teaching collaboration and other soft skills in education. Duxbury, MA: Wainhouse Research, 335 p.

[10] Gregorz, S., Smogorzewska, J., and Karwowski, M. 2018. Academic achievement of students without special educational needs in inclusive classrooms. A meta-analysis. *Educational Research Review* 21: 33–54. DOI:https://doi.org/10.1016/j.edurev.2017.02.004

[11] Kang, L. J., Xie, M. S., Liao, H.F., and Hwang, A.W. 2018. Environmental barriers to participation in preschool children with and without physical disabilities. *Int J Environ Res Public Health* 14(5):518. DOI:https://doi.org/10.3390/ijerph14050518

[12] Lemechshenko, O., Nakipova, G., and Akhmet, G. 2022. Improving the Program-Targeted Management Methodology and Its Practical Application for the Sustained and Environment Development of Agro-Industrial Complex. *Journal of Environmental Management and Tourism* 13(3): 769-781. DOI:https://doi.org/10.14505/jemt.v13.3 (59).16

[13] Magyar, A., Krausz, A., Kapás, I. D., and Habók, A. 2020.Exploring Hungarian teachers' perceptions of inclusive education of SEN students.*Heliyon,*6. DOI: https://doi.org/10.1016/j.heliyon.2020.e03851

[14] Meijer, C. J., and Watkins, A. 2019. Financing special needs and inclusive education – from Salamanca to the present. *International Journal of Inclusive Education* 23(7). DOI:https://doi.org/10.1080/13603116.2019.1623330

[15] Mitchell D. 2019. Education for respect and understanding – inclusion and equity. Cambridge, UK: *Commonwealth Education Partnerships,* 2018 p. www.cedol.org%2Fwp-content%2Fuploads%2F2012%2F02%2F55-57-20091.pdf

[16] Molina Roldán S., Marauri J., Aubert A., and Flecha R. 2021. How inclusive interactive learning environments benefit students without special needs. *Front. Psychol.* 12. DOI: https://doi.org/10.3389/fpsyg.2021.661427

[17] Nikolić, G., and Popović, Z. 2018. Examining educational achievement of students with disabilities in schools. Education, 1: 25–39

[18] Nurgalieva, S. A., Popova, M. V., Espolova, G. K., and Dyusembinova, G. K. 2018. Conditions and mechanisms for improving the quality of inclusive education in Kazakhstan. Bulletin *PGU* 2: 163-167.

[19] Okyere, C., Aldersey, H.M., and Lysaght, R. 2019. The experiences of children with intellectual and developmental disabilities in inclusive schools in Accra, Ghana. *African Journal of Disability* 8: 1–11. DOI:https://doi.org/10.4102%2Fajod.v8i0.542

[20] Peters, S. 2019. Inclusive education: Achieving education for all by including those with disabilities and special education needs. Washington, D.C.: WorldBank, 102 p. https://www.researchgate.net/deref/http%3A%2F%2Fdocuments.word

[21] Radisavljevic-Janic, S. V., Bubanja, I. R., Lazarevic, B. J., Lazarević, D. A., and Milanović, I. T. 2018.Attitudes of primary school students towards inclusion in physical education classes. *Teach Educ.*67: 235–248. DOI: https://doi.org/10.5937/nasvas1802235R

[22] Sedláčková, D. 2018. Pupils with physical disabilities and their experience with inclusive education. International Multidisciplinary Scientific Conference on Social Sciences and Arts. Sofia: STEF92 Technology Ltd, 673–680 pp. DOI: https://doi.org/10.5593/sgemsocial12018/3.5

[23] Sedláčková, D., and Kantor, J. 2021. The Lived Experience with Inclusive Education: A Case Study of a Teenager with Diabetes, His Mother, and His Teacher. *Clinical Psychology and Special Education* 10(2): 183–220. DOI: https://doi.org/10.17759/cpse.2021100211

[24] Shevlin, M., and Banks, J. 2021. Inclusion at a Crossroads: Dismantling Ireland's System of Special Education. *Educ. Sci*. 11: 161-170. DOI:https://doi.org/10.3390/educsci11040161

[25] Timo, S. 2018. How Common are Inclusive Educational Practices Among Finnish Teachers? International *Journal of Inclusive Education* 22(5): 560–575. DOI: https://doi.org/10.1080/13603116.2017.1390001

[26] Tsediso M. M., and Burmistrova V. 2020. Funding inclusive education for equity and social justice in South African schools. *South African Journal of Education* 40(4): 37-45. DOI:https://doi.org/10.15700/saje.v40n4a2037

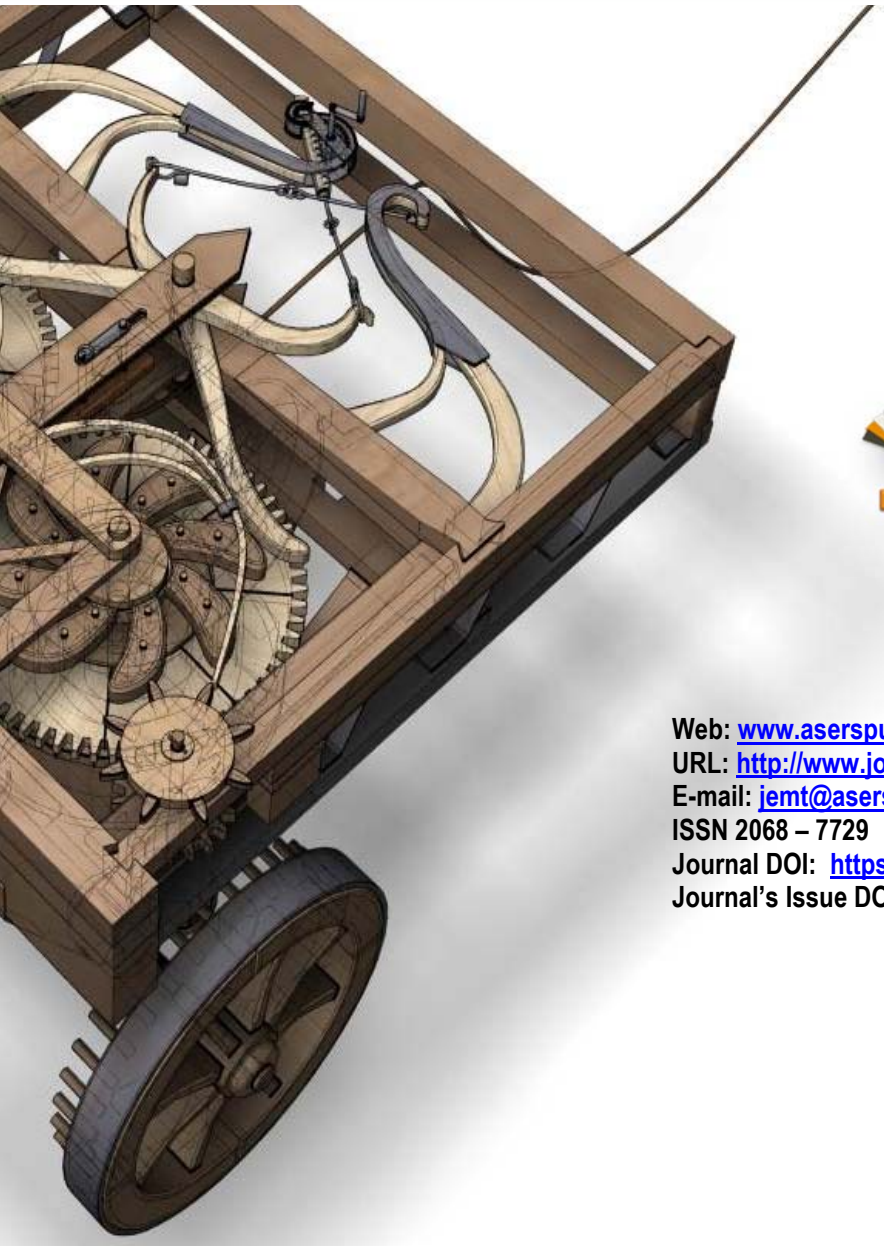
[27] van Kessel, R., Hrzic, R., Cassidy, S., Brayne, C., Baron-Cohen, S., and Czabanowska K. 2021. Inclusive education in the European Union: A fuzzy-set qualitative comparative analysis of education policy for autism.*Soc. Work Public Health* 36: 286–299. DOI: https://doi.org/10.1080/19371918.2021.1877590

[28] *** Official resource of the Data of the Committee on Statistics of the Republic of Kazakhstan for 2010-2022. https://www.stat.gov.kz

[29] *** Official resource of the statistical practice of the CIS countries and other countries of the world on disability issues. 2020. Moscow, 30 pp. https:////www.cisstat.org/

[30] *** Official resource of United Nation Convention on the Rights of Persons with Disabilities, adopted by General Assembly. https://www.ohchr.org/RU/HRBodies/CRPD/Pages/ConventionRightsPersonsWithDisabilities.aspx#preamble

ASERS



ASERS Publishing

Web: www.aserspublishing.eu
URL: http://www.journals.aserspublishing.eu/jemt
E-mail: jemt@aserspublishing.eu
ISSN 2068 – 7729
Journal DOI: https://doi.org/10.14505/jemt
Journal's Issue DOI: https://doi.org/10.14505/jemt.v14.5(69).00