

## Education for Slowing Down the Transformation of Nature Resources on the Example of the University-Wide Subject Home Economics and Technologies

Joanna Kostecka<sup>1</sup>, Wojciech Walat<sup>2\*</sup>

<sup>1</sup> Department of the Basis of Agriculture and Waste Management, Institute of Agricultural Sciences, Land Management and Environmental Protection, College of Natural Sciences, University of Rzeszów, ul. Ćwiklińskiej 2, 35-601 Rzeszów, Poland

<sup>2</sup> Department of Teacher Education, Institute of Pedagogy, College of Social Sciences, University of Rzeszów, ul. Jałowego 24, 35-010 Rzeszów, Poland

\* Corresponding author email: wwalat@ur.edu.pl

### ABSTRACT

The paper points out the need to verify the vision of man's place on Earth, erroneously based so far on the anthropocentric concept. At present, it should result from a biocentric perspective, in which at the existential level man occupies an equal position with other organisms in nature, but using his capacities for rational thinking, he regulates environmental changes on a micro and macro scale so as to enable the development of civilisation and the simultaneous renewal of nature's resources. This can allow sustainable development to be achieved by harmoniously combining economic growth with environmental requirements and participation in civil society building. Adequate university-wide education in this area is needed to create sustainability. In a university, it should be conducted in every field of study. The aim of the publication is to show the global trend towards using the concept of a university subject for teaching sustainable development: home economics and technologies in the world with the possibility of implementation in Poland. The authors also propose a new take on the issue and a dissemination of the above considerations towards homo-ecocentrism.

**Keywords:** sustainability, homo-ecocentrism, retardation of resource transformation, environmental education/technical education, university education.

### INTRODUCTION

A person's relationship with the cultural heritage of their own region cannot be overestimated, and according to Książek [2000] they should be made aware of this from childhood in order to develop a sense of their own identity, which is the basis for later involvement in the functioning of the immediate environment and an authentic openness to other communities and cultures. Similarly, people should be made aware of their relationship with nature – the environment in which they live. This is particularly important as international assessments of ecosystem quality state that nature is under great threat, with 60% of its ecosystem services destroyed or used in

ways that do not ensure their sustainability [Millennium Ecosystem Assessment, 2005]. It is also necessary to recall and other dangerous facts: the technosphere of the Earth constitutes in the 21st century a mass of more than 50 kilograms for every square meter of the surface of the Planet, and the number of products of human technofossils, which will remain on Earth for a long time and will testify to the current civilization of the Anthropocene, exceeds the number of species of living beings on Earth [Zalasiewicz et al., 2016; Zalasiewicz & Williams, 2017].

The Union of Concerned Scientists and more than 1,700 independent scientists, including most of the living Nobel Prize winners in the sciences, have written and reiterate a *Warning from*

scientists around the world to humanity. Concerned professionals are calling on humanity to curb environmental destruction and warn that if we are to save the world from real problems, a big change is needed in the way we manage the Earth and the life that exists on it. They emphasize the urgency of fundamental changes to avoid the consequences to which the still current course of human socio-economic development has inevitably led [Ripple et al., 2017; 2020].

Apart from the natural ones, the living environment is laden by threats created and intensified by man himself: acid precipitation, the greenhouse effect, the ozone hole, eutrophication of water resources, steppe formation, deforestation of the globe, pollution of the environment with waste, including dangerous one, nuclear explosions, production of low-quality food and many others. All the above manifestations of degradation of the natural and social environment directly or indirectly cause also a tragic disappearance of the Earth's rich biological diversity - plants, animals and fungi. This results in the disappearance of ecosystem services, which are a set of benefits provided to society and the economy by the natural environment [Kostecka, 2013; 2019; Kostecka et al., 2013; Walat, 2015].

In these circumstances, the authors of the study are convinced of the need to verify the vision of man's place on Earth, erroneously based so far on the anthropocentric concept. At present, it should result from a biocentric perspective, in which at the existential level man occupies an equal position with other organisms in nature, but using his capacities for rational thinking, he regulates environmental changes on a micro and macro scale so as to enable the development of civilisation and the simultaneous renewal of nature's resources.

Thus, we urgently need the recognition and dissemination of knowledge about the interrelationships and mechanisms between different ecosystem services, humans and their economies, and social problems, as this can improve the ability of service recipients to better manage natural resources, landscapes, or forest stands [Mizgajski, 2008, Cavender-Bares, et al. 2015]. The costs of the world's ecosystem services can be measured: the total value of the world's aquatic and terrestrial ecosystem services has been put at more than \$33 trillion per year (Constanza et al., 1997). Losses associated with biodiversity degradation can also be assessed. It has been estimated at 50

billion euros a year. It can be expected that by 2050 the financial losses associated with the loss of benefits could amount to about 7% of global consumption [TEEB, 2011].

Rockström et al [2009] identified nine global processes for which boundaries need to be set for safe human functioning on Earth. According to these authors, these limits have now already been exceeded in the systems of three processes (in addition to climate change and the nitrogen cycle biogeochemical flow boundary, which threaten human security, they point to the current rate of biodiversity loss).

Humanity receives further warnings, illustrated by the same and new alarming trends. We threaten our own future by our unrestrained, albeit geographically and demographically diverse, consumption and our failure to recognize relentless rapid population growth as a major causal factor in many ecological and even social threats [Crist et al., 2017]. The present situation thus forces a radical change in man's approach to nature if human civilisation is to survive. It seems that in view of further anthropopression, the loss of numerous ecosystems and the deterioration of many more, it is also necessary to try to update ethical norms and introduce new concepts such as violence on the natural environment into everyday human understanding and behaviour [Kostecka & Butt 2019]. Acceptance and understanding of this concept is shown so far by part of the group of students surveyed [Kostecka et al., 2019].

Revising the erroneous anthropocentric vision of man's place on Earth, we should replace it with a homo-ecocentric perspective, in which man does not occupy a distinguished existential position among other components of nature, but is obliged to care for sustainable development by harmoniously combining economic growth with environmental protection requirements and participation in building the civil society. These are the foundations of sustainable development, enshrined in the Polish Constitution of 1997 (Article 5). Adequate education must provide the basis for creating sustainable development. At university, one of the subjects predisposed to this is the technical education course.

The aim of the publication is to demonstrate the worldwide trend towards the use of the *Home economics* / technical education course in education for sustainable development. The following issues are highlighted in the paper: the evolution of the technical education course in Poland and in

the world, the philosophy of the technical education course, and education for global responsibility as an opportunity before the mentioned course. The issues presented in the article are important and relevant not only for students of pedagogy and teachers of technical education, but can also be an inspiration for teachers of other subjects, including, for example, subjects related to agriculture in its broadest sense, whose graduates can use the described data to expand their knowledge. Education for sustainable development is an important part of the infrastructure of knowledge, skills and competences of all citizens of the Planet.

## **EVOLUTION OF THE TECHNICAL EDUCATION COURSE IN POLAND AND IN THE WORLD**

In the European context, technical education is usually taught together with home economics in the subject Home economics and technologies and is one of the subjects in school and university where education for sustainable development is included in the general curriculum. The subject has ancient roots, but its aims and content have changed according to the stage of development of economics and politics, traditions, needs and priorities of daily life. The name of the course has also evolved: Handicraft, Practical Work, Home Economics, Household, Work Training.

Nowadays in European curricula Home economics and technologies has proven its importance in improving the quality of human life, and learners of this subject nowadays attach importance to the quality of the natural environment and want to acquire the ability to solve problems creatively in accordance with the concept of sustainable development [Lice-Zikmane, 2018]. These recommendations can be found in documents of the Commission of the European Communities [2008: Improving Competences for the 21st Century: An Agenda for European Cooperation on Schools] and UNESCO [2014: Education Strategy 2014–2021].

The development of this subject, e. g. in Latvia is very similar to the development in Estonia [Taar, 2015; Lice-Zikmane, 2018] where there is indeed an emphasis on the creative activity of the pupil and student. Home economics and technologies covers various topics related to sustainability [Lice and Reihmane, 2015]. One of the most important topics in the syllabus of the subject is

“craft / handicraft”, which students are introduced to from an early age. The program here includes making items from a variety of materials; for example, paper, cardboard, yarn, textiles and in various technologies, for example, gluing, folding, embroidering, weaving. Analyzing the activities of younger students, Volane [2016] points out that they are creative and active – they often create out-of-the-box artworks, surprising with their originality. At a higher level of education, students can already learn about more advanced technologies: textile, wood and metal technologies or other materials. Thus, they deepen their knowledge and improve their skills.

The process of teaching and learning handicrafts is also examined from the perspective of teaching for sustainability. For example, the use of different waste materials in crafts, their rational use, the teacher’s indication of pro-environmental and pro-social technologies is of great importance here. During craft lessons, students make specific goods on their own, learn skills and apply abilities in using new technologies, materials, and creating a project. Active learning, discussions and observations of each other’s work enrich them. Students also practice group and individual communication (craft learning is structured in small groups for efficiency). Exley and Dennick [2004] emphasize that in a small group it is much easier than in a large one to be encouraged to speak and act as well as to share one’s own knowledge and skills. Because communication is the heart of teaching, small group work is also a key step in creating teacher and student readiness.

By organizing the learning of crafts in small groups, students acquire many important skills for the future: self-organization, self-knowledge, self-management, thinking and creativity, cooperation, operability and participation as well as digital skills.

## **PHILOSOPHY OF HOME ECONOMICS AND TECHNOLOGIES COURSE**

Technical education should prepare both for the numerous tasks in the organization of society as a whole and for the excellent, sustainable organization of the home and everyday conduct. According to Mc Gregor [2012a, 2012b] those studying Home economics and Technologies engage in personal reflection and self-criticism so that their work is also morally justified. Their

**Table 1.** The influence of culture and philosophy of life on the main features of the shape of Home economics in different countries [Mc Gregor, 2012b]

Country	Characteristics
Canada	Transdisciplinarity, transformative, prosperity, focus on the human condition
USA	Reflective leadership, critical learning, qualities of life, shared practices
Europe and Scandinavia	Proper and thoughtful practice, sacred daily living, narratives, integral professionals
Australia	Carnival (esque), budding expert, beyond patriarchy, convergent moments, generational theory, future
Asia (especially Japan)	Visualization of human society, protection of people, home as a place to live, civilizational minimum

intention should be the deliberate acquisition of knowledge, skills and competences in such a way as to be able to organize well the functioning of social life at different levels. Due to the high level of competence required for e. g. home economics, the scope and purpose of these skills is on the one hand limited; however, good housekeeping requires complex knowledge and practice.

The training of students in home economics and technology is about the ability to optimize interpersonal relationships, manage household budgets and act pro-environmentally on a day-to-day basis. The philosophy of home economics is not the same all over the world, as practitioners of it in different countries are based on knowledge of different philosophies of life and culture shaped over generations (Table 1).

In our daily lives, we make ethical and moral decisions about problems facing humanity (often experienced in families) that may not have current solutions in our lives. So we need deeply held views about what should guide our mission-oriented practice that focuses on the morally charged, practical, perennial problems facing families, problems that span generations but require different solutions [Mc Gregor, 2012 a,b].

There has never been a more urgent time for teachers of technical subjects to feel the need to engage in the environmental humanities as well. This engagement should be both creative and critical because it touches on some fundamental questions of human survival strategies.

This need for action should be linked on the one hand to the unprecedented technological development that is known as the Fourth Industrial Revolution, but on the other hand to the acceleration of climate change, also known as the Sixth Extinction. This complex intersection of events produces multiple fractures, ethical dilemmas, affective disorders, political concerns, and critical lines of inquiry. They can be summarized as

convergent critiques of humanism on the one hand and rejection of anthropocentrism on the other. It is neither a simple nor harmonious intersection of critical lines, but rather an encounter full of painful contradictions and difficult problems [Braidotti, 2020].

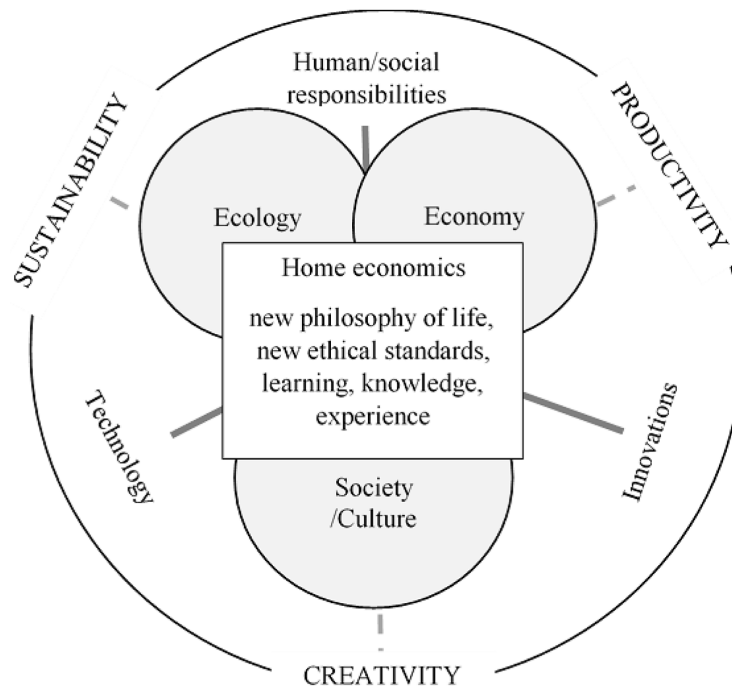
### EDUCATION FOR GLOBAL RESPONSIBILITY – AN OPPORTUNITY WITHIN THE HOME ECONOMICS / TECHNICAL EDUCATION COURSE

As it has been mentioned many times, the present times require urgent education of citizens and equipping them with knowledge, skills and competences essential for building sustainable development (Figure 1). We need more engagement with this issue – this can also be undertaken within the Home economics / Technical education course.

Turkki [2012] showed a complex identification for Home economics. According to her, studying is an opportunity to combine personal development, healthy lifestyles, social responsibility, sustainable use of resources and cultural diversity. There is also a place for civic education and lifelong learning. By studying the subject, you can gain a foundation in several service professions relevant to individuals, families and communities.

Technical education in Poland, like Home economics and technology in Europe, has a chance to effectively build awareness of sustainable development and shape actions promoting beneficial solutions to social, economic and environmental problems. This is due to the fact that:

- is action-oriented – it can promote sustainable practical actions;
- in the theoretical part of the subject, the strong relationship between man and the environment



**Figure 1.** Organizational challenges of the 21st century human on the way to well-being in homo-ecosystems, using activities in the subject Home Economics (own elaboration based on: Turkki, 2012)

can be exposed, as can the relationship between the individual – family – society;

- the course syllabus may include a strategy for solving perennial practical problems;
- the course syllabus can highlight solutions for sustainable action at home, school and in businesses by showing the use of appropriate materials and technologies;
- there is room in the subject to highlight the balanced links with all sectors of society and the economy;
- the subject matter can be inter- and transdisciplinary, referring to the present and the future, drawing positive examples from past practice.

## DISCUSSION

The state of current human development requires joining forces and acting together holistically. Technologists need to expand their horizons of seeing the world to include environmental humanities. As geologists sound the alarm about humans’ treatment of the Earth, environmental humanists similarly seek to initiate a “conversation of humanity” that seems rarely to take place outside universities. Castree (2020) considers the future of environmental humanities, specifically their relationship to the earth sciences, whose messages animate much current humanities

research. It cautions against adopting too hastily the concept of a ‘global environmental crisis’. He advocates forms of interdisciplinary work that give humanists equal respect with geologists. And it suggests that a modified paradigm of global environmental assessment may be a viable vehicle for greater humanistic influence in the global public sphere. All the while, humanists must somehow balance trust in the Earth sciences with a critical approach to its basic messages about the changing Earth system. This position is rooted in democracy, the necessary political basis for all legitimate decisions about humanity’s future on Earth. Leading the environmental humanities will be challenging, given the need for humanists to maintain academic freedom while working together to make an impact outside the academic domain.

Counteracting the degradation of the natural environment is the main objective of many contemporary authorities in the field of sustainable development organizations of the world. The extreme view of Wilson [2016] advocates dedicating half the Earth to strict nature reserves. According to this author, only such actions in the current situation, can help save the biodiversity of the Planet for the benefit of humans themselves who enjoy ecosystem services. This implies a slowdown in economic development as previously understood [Kostecka, 2013; 2019].



The justification for the preservation of natural resources in an unimpaired state, and ultimately increasing their sustainability and quality, would therefore have to be understood and accepted by entrepreneurs, all employee groups, decision-makers and average citizen of all ages.

Meanwhile, so far, taking care of nature resources, e.g. in environmentally valuable areas (landscape parks, protected landscape areas or Natura 2000), is not treated with understanding by many and is perceived rather as a barrier to development, whereas preserving the benefits of ecosystems for humans is a necessary condition for improving the widely understood quality of life.

Much depends on the attitude of ordinary people. Most political leaders are responding to public pressure, and therefore scholars, influential media and ordinary citizens must gain the conviction to change the concept of global development and the basis of everyday life and conduct. They must press governments to take immediate action as a moral imperative to present and future generations of humans and other living beings. Through intensive and organized grassroots work, the fiercest opponents can be defeated and political leaders can be convinced to take the right action. This is also the time to review and change our individual behaviors, including reducing our own reproduction (preferably to replacement levels) and drastically reducing our per capita consumption of fossil fuels, meat and other resources.

The path to sustainability can take many forms, but they all require civil society pressure, scientific evidence, political leadership and a deep understanding of policy instruments, markets and other drivers [Ripple et al., 2018].

The role of teachers and educators following current needs of social development based on education becomes invaluable here. Currently and for a long time, the need and opportunity for cooperation between teachers of different subjects in the field of education for sustainable development in its broadest sense has been emphasised. Janhonen-Abruquah et al. [2017] indicate that all teachers should see the power of interdisciplinary collaboration.

## CONCLUSIONS

Technical education in Poland and Home economics and Technologies in Europe provide an excellent platform for cooperation. Teachers are the

main actors in this process, which means that they have to share information, negotiate with those responsible for accepting subject syllabuses and be really present in designing and integrating the implementation of sustainability into everyday life.

In designing the scope of teaching technical education, handicrafts should occupy an important place. At a time when most everyday objects are manufactured industrially, thus encouraging the waste of resources and the destruction of ecosystems, the skills of repairing and making many everyday objects on one's own, including from waste materials, are again of great value from the point of view of the natural, social and economic foundations of sustainable development and green economy.

## REFERENCES

1. Braidotti R. 2020. "We" May Be in This Together, but We Are Not All Human and We Are Not One and the Same. *Ecocene: Cappadocia Journal of Environmental Humanities*, 1(1), 26–31. DOI: 10.46863/ecocene.31
2. Castree N. 2020. Speaking for the Earth and Humans In the "Age of Consequences". *Ecocene: Cappadocia Journal of Environmental Humanities*, 1(1), 32–43. DOI: 10.46863/ecocene.32
3. Cavender-Bares J., Balvanera P., King E., Polasky S. 2015. Ecosystem service trade-offs across global contexts and scales. *Ecology and Society*, 20(1), 22.
4. Commission of the European Communities. 2008. *Improving Competences for the 21st Century: An Agenda for European Cooperation on Schools*. Retrieved from: EN (europa.eu) (23.08.2022).
5. Constanza R., d'Arge R., de Groot R., Farber S., Grasso M., Hannon B., Limburg K., Naeem S., O'Neill R.V., Paruelo J., Baskin R.G., Sutton P., van den Belt M. 1997. The value of the world's ecosystem services and natural capital. *Nature*, 387, 253–260.
6. Crist E., Mora C., Engelman R. 2017. The interaction of human population, food production, and biodiversity protection. *Science*, 356, 260–264.
7. Exley K., Dennick R. 2004. *Small Group Teaching: Tutorials, Seminars and Beyond*. London: Routledge Falmer.
8. Janhonen-Abruquah H., Posti-Ahokas H., Palojoki P. 2017. Teaching and learning in Home Economics education. *International Journal of Home Economics*, 10(2), 4–5.
9. Kostecka J. 2013. Self evaluation on the way to retar-dation of pace of life and resources transformation.

- Problems of Sustainable Development, 8(2), 93–102.
10. Kostecka J. 2019. Ecological Engineering – a View on Tasks and Challenges. *Journal of Ecological Engineering*, 20(10), 217–224. DOI: 10.12911/22998993/113538
  11. Kostecka J., Butt K.R. 2019. Violence on the Natural Environment. “Problemy ekorozwoju – problems of sustainable development”, 14(2), 183–189.
  12. Kostecka J., Cyrankowska M., Podolak A., Kowalska B. 2019. Elements of reflection on education for sustainable development in 30 years from the Bruntland report. “*Studia Ecologiae et Bioethicae*”, 17(1), 5–17. DOI: 10.21697/seb.2019.17.1.01
  13. Kostecka J., Mazur-Pączka A., Jasińska T., Batóg K. 2013. The concept of “ecosystem services” and its role in education for sustainable development (on the example of elderberry *Sambucus nigra* L.). *Engineering and Environmental Protection*, 15(4), 405–417.
  14. Książek W. 2000. Ministry of National Education about regional education – cultural heritage in the region. Reform Library no. 24. Warszawa: MEN.
  15. Lice I., Reihmane S. 2015. Education for Sustainable Development at Home Economics. In: V. Dislere (Ed.), *The Proceedings of the International Scientific Conference Rural Environment. Education. Personality (REEP)*, 8. Jelgava: LLU, TF, 230–236. Retrieved from <http://llu.lv/conference/REEP/2015/Latvia-Univ-Agricult-REEP-2015proceedings-230-236.pdf> (23.08.2022).
  16. Lice-Zikmane I. 2018. Handicraft in the Context of Sustainable Education. In: *Rural Environment. Education. Personality*. Jelgava 2018, 11, 296–303.
  17. McGregor S.L.T. 2012a. Home economics philosophy(ies). Plenary at the Fifth International Scientific Conference. *Rural Environment. Education. Personality (REEP)*. Jelgava, Latvia: Latvia University of Agriculture, Institute of Education and Home Economics.
  18. McGregor S.L.T. 2012b. The role of philosophy(ies) in home economics. From: [latvia\\_home\\_ec\\_philosophies\\_keynote.pdf](http://latvia_home_ec_philosophies_keynote.pdf) (consultmcgregor.com) (23.08.2022).
  19. Millennium Ecosystem Assessment. 2005. *Ecosystems and Human Well-being*, Island Press, Washington, DC.
  20. Mizgajski A. 2008. Landscape management as an aspect of environmental management. *Landscape classification. Theory and practice. Problems of Landscape Ecology*, XX, 147–151.
  21. Polish Constitution of 1997. *Dz.U.* 1997 nr 78 poz. 483.
  22. Ripple W.J., Wolf Ch., Newsome T.M., Galetti M., Alamgir M., Crist E., Mahmoud M.I., Laurance W.F. 2017. “World Scientists’ Warning to Humanity: A Second Notice.” *BioScience*, 67(12) (December): 1026–1028. <https://doi.org/10.1093/biosci/bix125>.
  23. Ripple W.J., Wolf Ch., Newsome T.M., Phoebe B., Moomaw W.R. 2020. “World Scientists’ Warning of a Climate Emergency.” *BioScience*, 70(1), 8–12. DOI: 10.1093/biosci/biz088
  24. Rockström J., Steffen W., Noone K., Person A., Chapin S.F., Lamin E.F., Lenton T.M., Scheffer M., Folke C., Schellnhuber H.J., Nykvist B., de Wit C.A., Hughes T., van der Leeuw S., Rodhe H., Sörlin S., Synder P.K., Costanza R., Svedin U., Falkenmark M., Karlberg L., Corelli R.W., Fabry V.J., Hansen J., Walker B., Liverman D., Richardson K., Crutzen P., Foley J.A. 2009. A safe operating space for humanity. *Nature*, 461, 472–475.
  25. Taar J. 2015. Home Economics Curricula in Estonia. In: H. Janhonen-Abruquah, P. Palojoki (Eds.), *Creative and Responsible Home Economics Education*. Helsinki: Helsingin yliopisto, 164–175.
  26. TEEB (The Economics of Ecosystems and Biodiversity) (2011). *TEEB Guide for Cities: Ecosystem Services in Urban Economy*, Polish edition, Sendzimir Foundation, Kraków.
  27. Turkki K. 2012. Education for Global responsibility. A challenge for Home economics. *REEP Jelgava 2012*.
  28. UNESCO. 2014. *Education Strategy 2014–2021*. Retrieved from UNESCO education strategy 2014–2021 – UNESCO Digital Library (23.08.2022).
  29. Volane E. 2016. Pupils’ Creative Action at an Elementary School: Problems and Solutions. In: V. Dislere (Ed.), *The Proceedings of the International Scientific Conference Rural Environment. Education. Personality (REEP)*, 9. Jelgava: LLU, TF, 195–201. Retrieved from Pupils’ Creative Action at an Elementary School: Problems and Solutions (llu.lv) (23.08.2022).
  30. Walat W. 2015. Humanistic technique as a new paradigm of education [in:] *Around mechatronics IV*. Red. L. Leniowska. Wyd. UR, Rzeszów, 61–74.
  31. Wells G. 2004. The Role of Activity in Development and Education. *Journal for the Study of Education and Development*, 27(2), 165–187.
  32. Wilson E.O. 2016. *Half-Earth: Our Planet’s Fight for Live*. Liveright Publishing Corporation. New York-London.
  33. Zalasiewicz J., Williams M. 2017. The Earth’s technosphere shows how humans are permanently reshaping our planet. <https://soundcloud.com/university-of-leicester>.
  34. Zalasiewicz J., Williams M., Waters C.N. 2016. Scale and diversity of the physical technosphere: A geological perspective. *The Anthropocene Review*. DOI: 10.1177/2053019616677743