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From Metaphors and Complicated Approach to a Complex Pedagogical Method

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Abstract

The authors of the article have intended to examine the situation that has developed around the future of education and has begun to affect people with various unexpected turns and uncertainties in their daily lives. Education affects everyone and has an impact on the future of all people. Therefore, researchers of participatory ideas have addressed the uncertainties and problems of recent years in various situations and, with the techniques of reflexive hermeneutics of their lived experience, propose taking into account the uncertainties of using current complicated and complex approaches in understanding the complex nature of pedagogy. This could help divert the current wicked problems away from the dominant use of complicated approaches and mitigate the impact of the Anthropocene, as well as prevent the potential collapse of education under the conditions of the Anthropocene.

Keywords: Complex approach, complicated approach, intermingle, alloy, metaphors, floating concepts, participatory action research.

Lived Experience in Pedagogy

The idea for the article stems from its authors' interest in looking reflectively on their own pedagogical experience. This has been prompted by uncertainties that, in the authors' view, have arisen around education and its perspectives.

In this article, the authors return to some considerations on action research that emerged as personally meaningful insights gained through action research reflections and personal reflections on reorienting teacher education and higher education towards sustainable education through participatory action research. The research has been conducted by scholars at Daugavpils University via international collaboration for a long time. The Journal of Teacher Education for Sustainability (JTES) continues focusing on this tradition, without departing from the format of participatory action research and maintaining the participants' interest in the personally significant ideas concerning the implementation of an integrated approach to environmental education, eco-pedagogy, and sustainable education in local and global conditions. Since 2000, the authors have participated in deliberations on these topics, to the best of their ability, and have accumulated personally significant lived experiences selected for this article.

JTES publications have accumulated several articles that offer action research experiences on some other broader or narrower research cases studied at Daugavpils University, in which participants sought commonalities on the issues raised in the discussions [see JTES volumes from 2007 to 2025 at <https://reference-global.com/journal/JTES>]. Looking at the results of these discussions, one can see the path taken by the participants involved in collaboration: the diversity of experiences, the personally significant ones, and those postponed for later observation, a nonlinear, speculative goal-oriented approach towards the discovery and formation of the idea of ecological identity sought through reflexive action. These insights experienced in action become known, which influences the research process through the acceptance of insights and reflections at a personally meaningful level of reflection (Ware, 2025). Without this, a complex approach to pedagogy will not emerge.

The involvement of the authors in previous years was viewed more broadly, and looking back, we saw some inconsistency. In discussions concerning the reorientation of education towards sustainability, various participants use arguments and proposals that are explained on the basis of a complicated or complex approach. At the beginning of this century, the issue of sustainable development and the reorientation of education towards sustainability were affected by the uncertainties arising from the initially unnoticed impacts of the nature of Anthropocene (Adelman, 2018; Purser et al., 1995). The Anthropocene supported the limitation and even denial of the holism approach because the anthropocentric perspective was convenient for the new era. If the nature of the era has changed significantly regarding sustainability, the issue of reorienting education to the new conditions must also be reconsidered. Therefore, in this article we have decided to reconsider the meaning of the concept of "participation" in light of the current problems and uncertainties of education. In the authors' view, pedagogy is understood as inherently complex in a personally meaningful way, while in discussions one may encounter partners who see the basis for a complicated approach in pedagogy.

This can create intermingling situations. We have recognized the need to reconsider this previously unnoticed situation: that we need to rethink the issue of explaining the entire system and the complex processes taking place within it from the perspective of one common approach. This may not be noticed in discussions on important issues. The authors of the article have no doubts about the basis of the Earth system and the complex basis of pedagogy. The complex basis approved in science is suitable for use and can be used to predict the future of education and science.

Wicked Problems in Education

In this article, we will look at this lived experience through wicked pedagogical problems (Kopnina & Bedford, 2024), the solution of which has been delayed in education, in our opinion.

Long-term pedagogical experience can open a less common or previously unnoticed perspective, especially if the perspective of reflection changes the usual view. The personally meaningful gains of action research and the insights that researchers achieve in their research activities are not fleeting phenomena or getting obsolete. They are alive and are experienced via reality, through which the future of education is shaped and emerges in people's thinking. Long-term participation in the broader processes of life and education, sustained through personal interest, is supplemented by the experience of participation, the historical nuances of the process, and emerging contextual issues that open up a view to person's connection with and belonging to the system.

We have identified wicked pedagogical problems from our personally significant experiences formed in the process of participatory action research and from our understanding of the nature of the science of pedagogy, which has accumulated the evolutionary ecological experience of ontological development, which we actualize in the action research, referring to it conceptually or choosing frameworks for discussions about pedagogical approaches.

In participatory action research, the process of defining and explaining pedagogical problems is very important because it influences how research participants choose to address pedagogical problems. Choosing different perspectives leads to different approaches, each having its own set of potential outcomes and challenges.

Action research cases are familiar with the concept of a participatory integral approach, found in Ferrer's theory of integral transformative education (Ferrer et al., 2005). It seeks a fundamental basis in the integration of knowledge, love, and action.

From the perspective of pedagogical science, this core essential to participation indicates the goal for the formation of the flow of humanity essential to the mission of pedagogy (Salite, 2015), which can also be described as a complex, speculative, reflexive, and contemplative process of the formation of sustainable ecological identity. These are just some of the most important features used to identify pedagogical problems and select solutions. However, it becomes clear through these features that pedagogy is complex, and its theoretical basis must be sought in the theory of complex adaptive systems, in which the learning environment is a dynamic, nonlinear system, where the results of interaction are unpredictable, and where a feedback loop of continuous adaptation and

self-organization, which is deeper and more heterogeneous than the linear transfer of knowledge, exists at various levels.

Reversibility, sensibility and sensitivity in this belonging to the system provide a more sustainable quality of living, for which more natural and more balanced relationships are important. Therefore, if we are willing to understand the development of the planet Earth in a broader perspective and learn from the processes in the Earth's complex system, it is important for all of us to understand changes in the consciousness and identity of the human species in a broader evolutionary-ecological perspective and to understand the era-specific influences that accumulate in the human species/society as well as in individual lived experiences, culture, and education.

However, the nature of pedagogy is not only complex, but also speculative. This feature is typically not highlighted or referred to by its historical name as a speculative feature of pedagogy. However, it is speculative because of its goals and the mission of pedagogy. It cannot be viewed otherwise. Since Aristotle, this perspective has been known in science as observation, inspection, or reflection (Hall, 2019). Currently, its origin is traced to the Latin word "*speculari*" and is understood as thinking that is based on the observations of reason. "Speculative science" has been known since the time of Aristotle. It is a perspective of science that investigates the structures necessary to obtain certain experiences. Nowadays, authors of various scientific papers view the term "speculative" in the same way as thinking of necessity. It is already evident that "thinking of necessity" is interpreted as structural thinking about what is essential, and not just from a situational or emotional perspective. In our view, complex speculative thinking is becoming more relevant with the exacerbation of the wicked problems of the Anthropocene and the formation of various unprecedented crises and disaster nodes. Currently, thinking of necessity urges humanity to explore the true nature of the changes that have occurred through the flow of our own complex identity and the formation of thinking. Thinking of necessity is self-reflexive and contemplative and is dominated by the need for clear pedagogical goals and continuous deep reflection.

The situation in education challenges those working in this field to address the need to address issues concerning a pedagogical approach much more deeply and seriously, and thus broaden perspectives, which have been affected in recent years by the opacity of the theoretical heritage of pedagogy and its diminishing importance in education and education policy. The concept of an integral participatory approach addresses the aforementioned features of pedagogy, which are characteristic of the deepest layers of pedagogy, and from this perspective, it is possible to recognize the formation of various educational approaches through complex processes. In pedagogy, this deep perspective is natural.

We considered this issue in reflection that actualized some ideas concerning participatory research, which created obvious uncertainties and remained for some time as vague, unanswered contextual questions during our reflective search. Such contextual questions contribute to the exacerbation of wicked problems in education and continue to generate uncertainties, which currently do not create confidence in the bright future of education and its purpose.

It is impossible to ignore the experiences of participatory action because the choice

of approaches is influenced by real uncertainties that often trigger reflective discussions, and in participatory action research they often serve as the concept of “uncertainty”, which creates contextual questions outlining the perspectives from which the strategic choices of the pedagogical approach are made, and the understanding of their deeper complex nature is achieved.

The current collapse of human–nature relationships makes it clear that education is one of the most complex systems that can be and is being undermined in the same way as the natural evolutionary ecological relationship between humans and nature has already been undermined. Society has experienced this, and we can observe convincing evidence of this in the changes that have become realistically visible and measurable as ecological relationships at the beginning of the Anthropocene era. These changes are ongoing, and humanity is beginning to realize that they are significant and dangerous, and that these are profound destructive changes in the relationship between nature and humans, which have already become inseparable from people’s mental health and sustainable development today.

The Trinity of Ecological, Sustainability and Mental Health Issues in Education

Through human experience, wicked problems give various signals of a great many uncertainties in social behavior and communication. In participatory action research, we have encountered cognitive stagnation, methodological superficiality, language degradation, intellectual complacency, falsehood towards self and others, and there is an infinite variety of other uncertainties in real life. These are the diverse lived experiences that are influenced by ecological, social, and mental health realities of everyday life and the overall qualitative state of the Earth system. To summarize the situation regarding the impact of the Anthropocene on the increase in wicked problems very generally, we believe that the most important basis can be found in the trinity of ecological, sustainability, and mental health issues.

The mutual inseparability and complementarity of the three issues in this structure highlights unsustainability, in which the relationship between nature and humans and issues concerning human mental health conflict with the goal of survival of the whole system. In recent years, the influence of the era has become more visible. Anthropocentrism is increasingly being supplemented by egoism of various levels and shades, which agrees well with unsustainability. There are also categorical research conclusions that healthy ecological relationships and mental health are not possible in the environment of unsustainable relationships (Salite et al., 2022). In the Anthropocene era, the trinity of ecological, sustainability, and mental health issues has raised many questions about how society addresses issues in education, politics, educational administration, and social relations. The answers often reveal that these questions illuminate a persistent situation, which demonstrates that the formation of wicked problems and attempts to solve them make these problems even more intractable. The aforementioned trinity of wicked problems is a convincing example of the current era’s attitude towards the relationship between humans and nature and the connection of the processes forming

this trinity to humanity. This relationship has now become unsustainable. Regarding ecological relations, the concept of “educational ecology” has recently emerged; it is an artificially created expression or, more often, a metaphor of recent years that has preserved hardly any ontological connection with the concept of ecology in its broader sense. Due to its egotistical competitive stance, this concept of ecology in the narrower meaning demonstrates terminological manipulation, sometimes conceptual reductionism, and often a conceptual tendency to use narrower meanings of the concept of “ecology”. It is a modern and beneficial anthropocentric tool that is convenient for educational administration or politics, and it is already used by politicians. The narrow meaning of educational ecology is often used metaphorically, institutionally, to justify educational reform goals or other more personal needs. This creates a terminological illusion that a holistic concept is being used; in reality, its narrower meaning is offered instead of the broader concept. Such broader or narrower use of concepts is becoming more common, and all such cases increase the ambiguities mentioned above and the generation of wicked problems associated with them.

However, this is not the biggest way of creating confusion due to incorrect use of broader and narrower concepts. In educational ecology and educational science, another way of defining ideas or concepts has emerged where elements and components are listed in the definition. However, there is no clarity about the recognition of complicated and complex approaches in participatory research and in publications by educational researchers. The enumeration of elements sometimes promotes the avoidance of complex and multi-level theories in educational science, which have proven their relevance in explaining complex issues. Technically oriented researchers do not always have a pedagogical or social knowledge base, so an ecology of elements may emerge instead of a complex one, and a systematic approach rather than a systems approach becomes popular. The “creation” of new, broader, or narrower versions of “different ecologies” leads to confusion if the meaning of these versions is not explained. Consequently, various unexplained and sometimes incorrectly constructed information accumulates both in daily interaction and in professional communication. This creates tension, intensifies uncertainty about ecology, and creates “false noises” through information, which disorients politicians and all people. This may lead to deception or the use of metaphors, which will not reduce the confusion, but may result in intellectual atrophy, “brain rot”, or the emergence of some health disorders in an unsustainable environment of relationships and education. The metaphor “brain rot” (Thoreau, 2004) refers to mental fatigue and cognitive decline, the deterioration of intellectual status after prolonged online or face-to-face contact with an unecological, unsustainable environment of relationships or unsustainable education (Newport Institute, n.d.). In 2024, “Brain rot” became the Oxford Word of the Year (Oxford University Press, 2024, December 2). “Cognitive overload” is a more scientific term for the phenomenon of “brain rot”, where the amount of information and stimuli exceeds the brain’s processing capacity, causing mental fatigue and reduced cognitive function. Unsustainability always indicates the possibility of mental health problems. Novès (2025) examines the phenomenon of brain rot as a complex transformation of human consciousness in the digital age through the transformation of cognitive experience and ontological essence by digital technologies. Excessive use of

technologies can affect brain development, learning, memory, mental health and increase the risk of early dementia (Neophytou et al., 2019); therefore, people need to better prepare their minds and society for the present and future by improving resilience to new technologies (Farkaš, 2024) and information overload (Klingberg, 2009).

Looking back at the trinity of ecological issues, sustainability, and mental health problems created by the Anthropocene, it must be taken into account that the current ecology of education is inherently unsustainable, and the question arises whether education will not face even more severe challenges in the near future, which could metaphorically be referred to as “educational dementia,” which will complement the development of the current unpredictable phenomena of educational ecology?

What Can We Learn From Floating Concepts?

In 2015, we used “floating concepts” (Knappett, 2005) in participatory action research, which enabled us to find a pedagogical approach that we began to call the “intermingle” approach. In social and educational sciences, “floating concepts” refer to concepts or terms that do not have strictly defined, generally accepted definitions. Depending on the context, these concepts “float” between different meanings. Ten years ago, we used “sustainability” as a floating concept in the discussion. We interpreted it as a sustainable phenomenon due to the mood of the discussions at that time and the holistic perspective maintained by the participants. It was unusual that we were already using the idea of the Anthropocene, which had not yet demonstrated its undoubtedly unsustainable nature at that time. Now, ten years later, the nature of the Anthropocene era has become more visible, and we are now identifying it by linking it to contexts of unsustainability and giving it a clear meaning of unsustainability, which stems from the inherent nature of the Anthropocene. Unsustainability has now affected ecological relations and influenced education and health issues which have developed around the current wicked problems that have mounted in education and other areas.

It was surprising that the holistic perspective and the participants’ orientations in the discussion created a clearly visible sense of sustainability in the concept, which has been used in the meaning of an unsustainable category in recent years. Thus, we found that floating concepts could change their meaning if the contexts around them changed. In the following years, we interpreted the floating concept of sustainability as an unsustainably oriented concept. However, due to this change in orientation, we understood that floating concepts could be unsafe if the content of a concept were studied without connection to environmental changes and changes in the structures of space and other phenomena around the floating concept, that concepts defined from a more autonomous perspective could create surprises with unexpected changes of other meanings.

In the current era of uncertainty, many such floating concepts have accumulated: “democracy”, “justice”, “security”, “freedom”, etc. These concepts have emerged both through politics and through the incoherence of various political uncertainties. We would like to add “participation” to them. With normative and controlling tendencies in organizing and implementing action, the deeper meanings of these fluid phenomena will clearly not be touched. However, the complex system of the planet is dynamic. What

will happen if such phenomena lose their original meanings in reality due to changes in surrounding conditions? How will this affect education, and what uncertainties await humankind in the processes of forming humanity as an adaptive integral flow? From the perspective of a complex approach, the answer is: collapse.

In the context of the current wicked crises, the problems are caused by education and science, which have been focusing too long on mastering the elements and understanding normative and measurable goals. Reality is more complex, and it is impossible to predict the mixing of water and sand in a sea wave. Any particle can connect with any other. Knappett (2005) argues that “floating concepts” are a problematic conception because meanings and cognitive processes are never autonomous or abstract; they are always embodied in material practices and relationships between people and things, thus making material culture an active participant in thinking rather than a passive backdrop.

The discovery of floating sustainability as a form of unsustainability sparked our interest in the phenomenon of intermingle. Now we have started to develop an interest in the idea of alloy (alloy, amalgam). It is rooted in Paracelsus’ view concerning the connection between man and nature, which he saw in the phenomenon of alloy. Philosophically, this idea can be seen as an ontological basis, where the components of alloys are not separable, but they also do not turn into one homogeneous mass. They retain the structure of heterogeneous relationships and develop and retain the properties of heterogeneous identity. If we look at the results of processes, in alloys the results are not reducible to components. The idea of alloy can be seen as a metaphor for alloy, but it is more indicative of a complex process method.

The current intermingle and alloy approaches that emerged from the participatory action approach are a kind of slightly more specific level cases of the complicated and complex approaches. Essentially, both approaches look more closely at what happens in complicated and complex processes. This insight can also shed light on the answer to the question of what sustains the non-recognition of the complicated and the complex. In our opinion, something similar can also be found in the non-recognition of the interdisciplinary and transdisciplinary and in the thinking of current global and regional leaders at various levels. It stems from the perspective of the complicated approach to activities viewed from the perspective of the Anthropocene. However, in the era of educational problems, it is essential for the future of education and the adaptive integration of humanity to implement a complex understanding of education and to use complex methods and tools for its implementation.

Conclusions

The perspective on the future of education is based on the researchers’ lived, personally meaningful experiences gained through participatory action research. A perspective for examining the issue has been developed within a broader evolutionary ecological context, in which the complex planetary system is viewed as an open, dynamic, and adaptive system affected by the changes occurring at the beginning of the Anthropocene era.

At the beginning of the Anthropocene, the evolutionary ecological, holistic perspective diminished due to changes in the ecological intensities of humans and nature and other

complex flows. The changes have come with unexpected ambiguities of identity and difficult wicked problems.

The authors connected the complex nature of pedagogy with the current situation in reality, in which they referred to the problems of sustainability, humans and the environment, and mental health, which were seen as essential in the current situation of collapse, and the challenges that accompanied the avalanche of human-made problems.

The review of experiences focused on the choice of pedagogical approaches, the most typical views of teachers and education professionals, as well as politicians. In the Anthropocene, most people still do not see the differences between complicated and complex educational approaches. Based on the experience of the study participants, some cases have been identified, reminding the researchers that participatory action research can reveal unexpected shifts from sustainable to unsustainable concepts, and that it is important to pay attention to the use of educational approaches and tools for their implementation.

The authors have used their conviction about the complex nature and mutual correspondence of pedagogy and the planetary system and see that in the current period of uncertainty and human-made crises it is necessary to switch to the use of complex approaches and complex methods in education to avoid further unexpected process collapses. Complex education should use complex methods, which are its fundamental basis. Currently, the use of metaphors concerning education and the use of complicated approaches externally create the impression that these are short-term (temporary) patches that will not resolve the issues concerning the correspondence of education to its complex nature and the goals of humanity, which constitute the aims of pedagogy and education.

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