

"SANDPITS" AS AN INNOVATIVE METHOD OF TRANSDISCIPLINARY RESEARCH IN HIGHER MARITIME EDUCATION

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Abstract. The "Sandpits" is analyzed as a transdisciplinary research method in higher maritime education, which requires a paradigmatic transformation of the educational process, the development of students' exploratory competences, deductive and inductive skills and other. The article analyses the peculiarities of this approach, during which participants go through an intensive path of innovative, out-of-the-box thinking and brainstorming. The researchers find that the key ideas are not those that have been prepared before, but those that are developed from scratch at the event itself, created in a few days by participants who have just made contact. The results of the implementation show that participants are challenged in an interactive process with researchers from disciplines with which they do not normally collaborate. The authors determine that the implementation of collaborative activities can be effective if there is mutual involvement in key activities, such as defining research questions and problem solving, cooperation aimed at achieving an agreed common goal, and regular contacts between group members, during which they try to collectively influence the development of an unconscious common scientific identity. The publication emphasises that the implementation of the "Sandpits" opens up new avenues for scientific research, allowing it to be viewed in a new, interdisciplinary dimension.

Keywords: Sandpits, method, synergy, transdisciplinary approach.

Introduction

Nowadays, in the modern educational environment, in particular in higher maritime education, there is a need to innovate approaches to encourage and develop research competence for students. Modern scientific research is polyphonic in its essence, so many approaches and ideas could be considered. The most interesting of the approaches is synergetic (Haken H. 2006), which focuses on the enormous possibilities of transdisciplinary research. Nowadays there is a demand to explore innovative approaches to encourage different groups of researchers towards cooperation in addressing technical and humanitarian issues in higher maritime education. To effectively achieve a succession of tasks, it is advisable to implement joint interdisciplinary initiatives. The central place of interdisciplinary research in addressing the challenges of the XXI century is evidenced by a number of developments in theory and practice. Scientists perceive the task of interdisciplinary cooperation in effective integration, which takes into account the relevant norms and values of different communities sufficiently to enable collective action around specific research tasks. This can be accomplished through participatory research processes in which researchers address specific issues that arise around value contradictions. Studying this process as a collective scientific inquiry provides insight into the dynamics through which meaningful interdisciplinarity is formed in practice (Maxwell, Benneworth, 2018).

Modern pedagogical research devotes a lot of attention to the transdisciplinary approach in the educational process. Research indicates that the integration of academic disciplines, continuous scientific research and finding effective ways for future specialists to acquire theoretical knowledge and practical skills will provide a new consolidated basis for the implementation of vocational higher education requirements (Daneshpour, Kwegyir-Afful, 2022). This issue is very relevant in contemporary studies of pedagogy, philosophy and other social sciences and humanities, as it is

considered by such Ukrainian researchers as Ganaba, S., Dolska, O., Zabolotna, O., Zelinskiy, S., Lebid, A.

In foreign studies the issues of transdisciplinary, synergy stimulation and knowledge integration were studied by Osborn, T. Nicolescu, B., Klein, J. Th, Jantsch, E., Galvani, P. and others (UNESCO 2020). Thus, successful and coherent participation in interdisciplinary research, and now it is possible to speak about transdisciplinary research, requires participants to make assumptions in accordance with the standards established in at least two different research communities.

Actual issues of higher maritime education are actively pointing to the challenges and relevance of finding new transdisciplinary approaches to activities, in particular to the study of technical and humanitarian issues. Thus, O. Barylnyk-Kurakova argues that interdisciplinary links in the system of professional training of future maritime specialists are an integral part of the development of a modern maritime specialist, as it contributes to the training of highly qualified personnel competitive in the labour market (Korobova, Barylnyk-Kurakova, 2020).

The **object** of the study is "Sandpits" as an innovative methodology for researching technical and humanitarian issues.

The **aim** is to analyze the use of "Sandpits" to actualize changes in research practice in higher maritime education.

The **tasks** of the research are the following:

1. Identify the features of Sandpits as an innovative methodology for researching technical and humanitarian issues.

2. Analyze the experience of implementing "Sandpits".

3. Discuss the results of the implementation of "Sandpits" as an innovative methodology for researching technical and humanitarian issues in higher maritime education.

The research **methods** include: analysis of scientific literature (as a decomposition of the whole complex phenomenon into its components, simpler elementary parts and the allocation of individual sides, properties, connections), synthesis (as a combination of components of a complex phenomenon, that is, knowledge that expands previous experience, constructs something new), interpretation (interpretation of features and results), generalization (fixing common features and properties of objects, making the transition from the individual to the general, from less general to more general).

1. Sandpits methodology

"Sandpits" claim to be innovative determinants of generating ideas for solving vital technical, humanitarian, philological and other issues. "Sandpits" research, where an interdisciplinary group of researchers and practitioners come together for a limited time to generate new ideas on a specific topic, is becoming increasingly common as a way to encourage innovation and creativity in research. This intensive event aims to encourage the transition from individual researchers interested in a particular problem to the formation of teams that present more or less well-founded ideas to research councils. Typical "Sandpits": participants spend the first few days actively thinking without the usual institutional constraints to imagine how research could develop with a group of participants. All the following days are devoted to selecting and combining these creative ideas, turning them into ideas for concrete proposals that will be decided in a more traditional form afterwards.

The feature of such events is that:

- participants of "Sandpits" go through an intensive way of innovative, non-standard thinking and brainstorming;

- the key ideas are not those that were prepared earlier, but those that were developed from scratch at the event itself, created in a few days by specialists who have just made contact;

- participants are challenged in an interactive process with researchers from disciplines with which they do not normally collaborate;

- establish regular contacts between members of the group, during which they try to collectively influence the development of an unconscious common scientific identity.

Implementation of joint activities can be effective provided that mutual involvement in core activities such as defining research questions and problem solving; collaboration aimed at achieving an agreed common goal.

Through this "Sandpits" format, however, it was hoped to bring together different disciplines and stakeholders to generate new ideas, learn more about opportunities, and provide participants with the opportunity to make connections that can continue into the future. A constant feature of the discussion with the participants and a frequent point of reference for personal reflection (as "Sandpits" coordinators) concerned the question of how, and if so, to what extent, disciplines can interact.

Thus, "Sandpits" open new ways for scientific research allowing us to consider them in a new, interdisciplinary dimension.

2. Empowering Sandpits in practice

The event was attended by 10 first-year cadets of the Faculty of Navigation. The language of the event was English. They were faced with a number of challenges: the search for effective sea routes. The cadets had to work out on their own the peculiarities of the geographical location of territories and ports, to know the requirements for the technical condition of the vessel to pass this zone and to take into account all the factors that may affect the passage. Two teams were organized, each team had to develop the most dangerous ways of the vessel and prove the effectiveness of the implementation of such a way, taking into account the technical features of the vessel, the specifics of geographical zones, etc. The experimental work took place during several days: the first day was the acquaintance of students with each other, communication in order to understand each other's preparedness, exchange of thoughts and ideas (2 hours). The second day: the direct solution of the task (3 hours).

In order to determine the effectiveness of this event and the personal impression of the participants, we conducted a survey.

The followings questions were suggested:

- A. Was the format of the training convenient/not convenient / undecided?
- B. Did you feel comfortable/not comfortable / undecided?
- C. Was the learning process using the scientific research method "Sandpit" interesting/not interesting/undecided?
- D. When working in a team, was I heard/not heard/not included in the process?

3. Outcomes of the event

Most participants assessed the event as effective, which was determined by a number of indicators, which included:

a) convenient format of engaging participants in cooperation (allowed ensuring the balance of interests between researchers and creative and active practitioners). Thus, 5 (50%) of higher education applicants noted the convenience of the format of work, 4 (40%) of higher education applicants did not feel comfortable in the process of work. 1 (10%) student has not decided on the specifics of working with this methodological tool;

b) each participant felt comfortable, and each participant's opinion was of equal value to the opinion of other participants. Thus, 9 (90%) of higher education applicants confirmed the feeling of comfort while working in the Sandpit. 1 (10%) applicant could not say for sure whether he or she felt comfortable while working or, on the contrary, it was uncomfortable;

c) all participants acknowledged that the learning process using the Sandbox method is interesting, all 10 (100%) of higher education students noted that this method makes it easier to perceive and remember information, because during the work, attention, memory, motivation to find the answer as quickly as possible, even a certain degree of competition are maximally involved.

d) as a result, the event was quite inclusive and the opinions of the participants were properly reflected. 8 (80 %) of higher education students confirmed that their opinions and ideas were taken into account in the process of work and created conditions for a comprehensive analysis and critical evaluation of the proposed solutions to educational problems. 2 students (20%) could not decide on

a specific answer or whether they were able to get involved in the work process. Perhaps, the main role here was not played by the ability to work in a team, but this is the task of another study, which has significant prospects not only for studying the specifics of the scientific sandbox method, but also issues related to the formation of teamwork skills.

The participants suggested launching a series of "Sandpits" following the main series of events, using the following methodology:

- the initial stage is to identify the dominant problem and secondary issues that objectively arise in the process of deduction;
- the second stage - determination of effective ways of further epistemological search using the inductive method;
- the third stage is the organisation of management and implementation of the identified ways through the explication of the results obtained on all key components of the educational problem to be solved;
- the final stage is the discussion of the results, their verification, validation and extrapolation of the developed solutions.

Conclusions

The analysis of the study on the implementation of the "Sandpits" as an innovative methodology for researching technical and humanitarian issues and for actualising changes in the scientific practice of higher maritime education has made it possible to draw certain conclusions.

1. The study revealed certain features of the "Sandpits" as an innovative methodology for researching technical and humanitarian issues. In more details, using research "Sandpits" as a teaching method in higher maritime education, it is possible to actively develop basic general scientific competences, such as fundamental knowledge of the peculiarities of the scientific process of cognition, understanding of the cause and effect relationships of the development of the process of scientific cognition and the ability to use them in professional and social activities. To develop and improve social and personal competences, especially teamwork and interpersonal communication skills: the ability to interact with other members and work in a team, the ability to form interpersonal relationships in a team, to defend one's own position during a discussion; a positive attitude to the "dissimilarity" of thinking and research and, at the same time, sociability, responsibility, dedication, ability to self-development and self-improvement. Thus, sandbox research creates an opportunity to deepen the knowledge of higher education students, as they have to master a number of issues, prepare for the event, and form their own vision of the situation.

2. Having reviewed the experience of conducting "Sandpits", it was concluded that these competences can be actively developed through the use of a transdisciplinary approach, which creates a number of challenges for students in terms of the level of development of communication skills, the availability of a certain theoretical level of training in a number of disciplines, etc. Thus, the proposed methodology can be reasonably used as an active tool for the formation of the creative personality of a higher education student.

3. The results of the implementation of the "Sandpits" as an innovative methodology for researching technical and humanitarian issues in higher maritime education as presented in the study are the first tentative effort to explore the specifics of the proposed methodology and give reason to assume that the use of research "Sandpits" in the educational process in higher maritime education will have significant prospects for the development of the educational process.

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