
INCLUSIVE SCIENTIFIC AND ARTISTIC ENVIRONMENT. THEORETICAL MODEL AND APPLIED STRATEGIES

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Abstract: This article explores the connections between culture, art, climate change, and social issues, analyzing their impact on artistic creativity in the city of Plovdiv, Bulgaria. Plovdiv, one of the oldest continuously inhabited cities in Europe, was designated as the European Capital of Culture in 2019. The city's transformation focuses on establishing it as a European cultural, ecological, and smart city. This evolutionary process is based on a combination of traditions and the development of new contemporary models rooted in science, ecology, and inclusion.

The article presents successful practices that highlight the role of art in improving the quality of life and promoting inclusion, while simultaneously advocating for environmental preservation and the return to ecological habitats for urban residents. Additionally, it explores the development of inclusive environments outside of traditional settings for creative and scientific endeavors.

Keywords: Social Inclusion, Creative Environments, Urban Transformation

1. INTRODUCTION

The approach to scientific communication is particularly important in the context of collaboration between art academies and scientific institutes. The arts play a crucial role in simplifying and visualizing complex scientific ideas, making them accessible to a broader audience and creating opportunities for public engagement with key topics such as sustainable development, ecological innovations, and social inclusion. Scientific communication not only informs and entertains, but it can also influence policies and provoke changes in societal attitudes (Okete, 2024).

Inclusive scientific communication focuses on removing barriers to knowledge access and transforming stigma into positive recognition. People who exceed social standards and possess qualifications that attract public attention are often perceived as inconsistent and face negative consequences of stigmatization (Erçetin, Güngör, & Açıklan, 2016). At the same time, the media can play a significant role not only in the negative portrayal of mental health issues but also in reducing stereotypes by offering alternative, more objective narratives (Livingston et al., 2025).

In their 2020 study, Canfield and colleagues identify three main characteristics of inclusive scientific communication: intentionality, reciprocity, and reflexivity. Intentionality is manifested in the awareness of the audience and the application of approaches that consider the cultural context of recipients, promoting active dialogue. Reciprocity emphasizes the collaborative development of practices for engaging with science, recognizing the value of expertise both from communicators and from their audience. Reflexivity provides a mechanism for continuous feedback and the adaptation of communication strategies to the evolving needs of the audience (Caulfield, Bubela, Kimmelman, Ravitsky, 2021).

Examples of social engagement through science and art can be found worldwide. Artists often use art as a medium to engage with social issues, disrupting established social norms to stimulate reflection and action (Hannes, Laermans, 2020). In a similar context, research teams demonstrate how aesthetic goals of design and art-inspired interventions in public spaces can be linked to social-cultural and health policies. For instance, Muñoz-Bellerín and Cordero-Ramos (2021) explore collective theatrical creativity in support of homeless people in Seville, Spain. Furthermore, Campagnaro et al. (2021) use design anthropology to transform caregiving spaces, thereby improving both the quality of life for users and the quality of services themselves.

The shared experience in our work is based on organized events for the communication of science and art in the city of Plovdiv, which have been taking place since 2010. These events were funded through projects such as the

"European Night of Scientists" competition and the "Green Culture – Green City" 2024 competition, supported by the Plovdiv 2019 Foundation. These events create opportunities for active interaction between the scientific and artistic communities, fostering innovation and social inclusion.

2. MATERIALS AND METHODS

The study employs a combined approach, based on observation and data analysis, to investigate the inclusive role of science and art in the popularization of scientific concepts and their impact on society. The methodology consists of the following key components:

Observation: The study begins with observations of events, seminars, and initiatives organized within the framework of collaboration between art academies and scientific institutes in the city of Plovdiv. These events are funded by competitions such as the European Researchers' Night ([link](#)) and the Green Culture – Green City program ([link](#)), which create platforms for knowledge exchange and experience between the scientific and artistic communities. The observation includes both direct participation in these events as well as the collection of data on public reactions and participant interactions.

Contextual Analysis: The method also includes a contextual analysis of the local socio-cultural environment of Plovdiv and the ways in which the local community responds to initiatives promoting inclusive science and art communication. This involves an analysis of specific projects and their impact on the local cultural context, including the influence of these initiatives on social attitudes towards science and art, as well as their contribution to addressing societal challenges.

The goal of this methodology is to provide substantiated data and insights for expanding opportunities for inclusive scientific communication through the integration of scientific and artistic practices, thereby creating a more accessible and engaged environment for public discussion of important social and ecological issues.

3. RESULTS

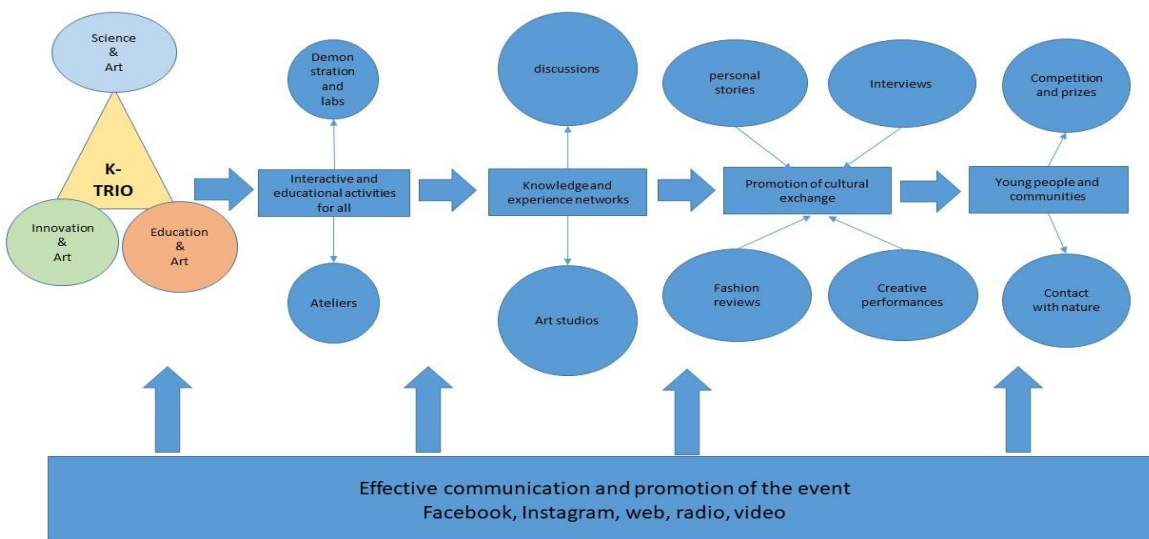
This study examines the inclusive role of science and art in engaging the public, with a particular focus on young people, with scientific and artistic concepts in the context of Plovdiv, Bulgaria. The research is based on the collaboration between two key organizations: the Center of Plant System Biology and Biotechnology (CPSBB) and the Academy of Music, Dance, and Fine Arts (AMDFA) "Prof. Asen Diamandiev". CPSBB is an innovative independent research organization that has rapidly established itself as a leading institute in plant science in Bulgaria, contributing to fields such as bioinformatics, biotechnology, genetics, genomics, metabolomics, and systems biology. AMDFA is a well-established higher education institution specializing in music, dance, and fine arts, also playing an important role in promoting the arts within the scientific context.

A key element of the study is the concept of the Knowledge Triangle, which emphasizes the interaction between research, education, and innovation. Special attention is given to the channels of interaction between these three domains. The study draws from theoretical frameworks such as the Triple Helix, Quadruple Helix, and Pentagonal Spiral models, aiming to trace the evolution of these models in the context of integrating arts into the innovation ecosystem. It explores the importance of local and regional participants in stimulating innovation and discusses mechanisms for engaging a broader society in the knowledge economy.

Etzkowitz, Lundvall, Jackson, and other researchers highlight the interdependence of science, education, and innovation with the structure of the national or regional innovation ecosystem. Their studies preceded the development of subsequent functional models and concepts, such as the Triple Helix, Quadruple Helix (Etzkowitz, 1983, Lundvall, 1992, Jackson 2011.)

The study proposes a strategy to increase stakeholder engagement in Plovdiv, which includes combining various forms of events and initiatives to attract young people to science, knowledge, and the arts. The strategy encourages ecological thinking and active public participation. Through these collaborative initiatives and events, the aim is not only to increase engagement with scientific and artistic processes but also to support the green transformation in Europe. Ultimately, the study seeks to create an inclusive and sustainable environment that fosters the dissemination of knowledge and active participation in scientific and artistic endeavors.

Figure 1. Concept for increasing stakeholder engagement in the city of Plovdiv



Source: Authors' research (Presented at CULTURS <https://ces.uc.pt/en/>)

This concept integrates scientific rigor with artistic freedom, providing spaces for active interaction, inspiration, and the exchange of ideas among diverse social and professional groups. Participants had the opportunity to directly engage in scientific experiments, such as DNA isolation, enzyme work, 3D printing, and other laboratory activities, effectively involving various stakeholders. Special attention was given to presenting scientific processes in an accessible and engaging manner. Workshops in painting, decoupage, and other artistic forms attracted not only art enthusiasts but also scientists, who were inspired by the opportunity to merge scientific and artistic creativity. Discussions and round tables, combining representatives from different scientific and artistic fields, allowed participants to exchange ideas and experiences. This format not only attracted young people but also professionals, fostering broader networks. Fashion shows, focused on themes like environmental responsibility, raised awareness about both ecological issues and creative expression. Additionally, involving students and PhD candidates in concerts and artistic performances highlighted the dynamic nature of contemporary art. Photo contests and creative competitions with prizes engaged a wider audience. Involving children and young people through various competitions contributed to long-term engagement, fostering new interests and skills. Initiatives like planting palm trees or other plant species with public involvement provided not only personal satisfaction but also a sense of community solidarity in addressing important environmental and scientific matters.

All of these activities and observations were part of the European Researchers' Night events held between 2018 and 2023, as well as the K-TRIO project (<https://night.nauka.bg/>), which focused on fostering interdisciplinary collaboration between science, education, and innovation. These initiatives played a key role in promoting public engagement and knowledge-sharing across the community, bridging gaps between scientific and artistic domains.

Figure 2. CPSBB - Examples of collaborative work



Source: Vesela Kazashka

Figure 3. CPSBB - Examples of collaborative work



Source: Vesela Kazashka

Another key initiative that affirms the concept is the project "Permaculture – Spaces and Art" from the "Green Culture – Green City" competition by the Plovdiv 2019 Foundation. The project highlights the role of imagination and cultural tools in finding solutions to global environmental issues. Its goal is to raise public awareness and encourage collaboration to strengthen the connection between people, the city, and nature within the ecosystem of Plovdiv. The project focuses on urban sustainability in the face of climate change and the importance of awareness and responsibility within communities for environmental preservation and improving quality of life.

This project emphasizes the role of imagination and the tools of arts and culture in developing conceptual proposals that address global environmental problems. It explores the intersection of culture, the arts, and the Anthropocene, examining climate change and the social and humanitarian crises triggered by it, as well as how these issues are expressed through art. The project raises questions about our choices, contributions, resistance, and support, striving to transform the present into a foundation for a healthier and more prosperous future.

The selected locations for the events were iconic and emblematic places in Plovdiv, which the city is proud of. Through art and cultural activities, visitors were encouraged to reflect on whether we are giving enough to our surrounding environment to allow it to thrive, and how small, everyday choices can create a cleaner and greener space. The aim is to work together to transform Plovdiv into a better place to live, both for the present and future generations.

Figure 4. Permacultura



Source: Yuskan Adem

4. DISCUSSIONS

The two projects presented exemplify the evolution of science, art, and innovation from the "Knowledge Triangle" concept to the "Quadruple Helix" and "Quintuple Helix" models. These examples highlight the collaboration between two organizations and demonstrate the synergy between scientists, researchers, artists, the business sector, government, and society at large in support of an ecological and spiritual way of life.

The transformation of the economy and lifestyle in favor of ecology, new technologies, and globalization are significant factors influencing our way of life. However, these changes begin with a shift in thinking and a reimagining of the future. The projects demonstrate that this transition does not solely rely on technological advancements but also on how we shape and communicate our collective vision.

Our goal, through science and art communication events, is to redirect attention to the creation of conditions for prosperity and environmental protection. These events serve as a platform for engaging society, government, businesses, and other stakeholders in fostering sustainable practices and ecological awareness. The integration of science and art not only enriches public discourse but also opens pathways for innovative solutions to global challenges.

5. CONCLUSIONS

Collaborative initiatives between organizations from diverse scientific fields, the business sector, and local authorities continue to draw a successful and progressive path for the future. These initiatives are essential for the development of smart and sustainable cities, as well as the creation of knowledge that can guide future policies. By focusing on the intersections of culture, ecology, and innovation, we can contribute to building a more harmonious relationship between humanity and the environment, ensuring long-term sustainability.

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REFERENCES

- Campagnaro, C., Di Prima, N., & Ceraolo, S. (2021). Co-design and the collective creativity processes in care systems and places. *Social Inclusion*, 9(4), 130–142.
- Caulfield, T., Bubela, T., Kimmelman, J., & Ravitsky, V. (2021). Let's do better: Public representations of COVID-19 science. *FACETS*, 6, 403–423. <https://doi.org/10.1139/facets-2021-0018>
- Erçetin, Ş. Ş., Güngör, H., & Açıklan, Ş. N. (2016). Different sides of a reality: "Positive stigma". In *Handbook of research on chaos and complexity theory in the social sciences* (pp. 125–132). IGI Global.
- Etzkowitz, H. (1983). Entrepreneurial scientists and entrepreneurial universities in American academic science. *Minerva: A Review of Science, Learning and Policy*, 21, 198–233.
- Hannes, K., & Laermans, R. (2020). Среца с артистични изследователски практики: Анализ на техните критични социални потенциали. *Art/Research International: A Trans-disciplinary Journal*, 5(1). <https://doi.org/10.18432/ari29533>
- Jackson, D. J. (2011). *What is an innovation ecosystem?* (White paper). Arlington, VA: US National Science Foundation.
- Livingston, V., Jackson-Nevels, B., Davis-Wagner, D., Jameson, D., & Joyner, C. (2025). Dignity in mental health—examining the dynamics of mental health stigma: A narrative review. *Academia Mental Health and Well-Being*, 2(3). <https://doi.org/10.20935/MHealthWellB7837>
- Lundvall, B.-Å. (1992). *National innovation systems: Towards a theory of innovation and interactive learning*. London: Pinter.
- Muñoz-Bellerín, M., & Cordero-Ramos, N. (2021). Citizen art and human rights: Collective theatre creation as a way of combatting exclusion. *Social Inclusion*, 9(4), 106–115.
- Okete, W. (2024). Promoting inclusion in science communication through the infusion of art. *The Biochemist*, 46(3), 7–10.