

Science and Art: A Phenomenological Approach to Developing a Dialogue in the Educational Context

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Abstract

In educational settings, communication represents many challenges for the interaction between scientists and artists. The nature of these challenges is given particular clarity when examining communication between artists and scientists with respect to pedagogical approaches which emphasize the importance of dialogue as part of the educational process. We approach this by analysing communication interaction between the two groups in the context of cross-disciplinary educational environments in which art and science are explored simultaneously. The main question was how communication among professionals across disciplinary borders of art and science in an educational setting could be characterised? The communication experience of nine interviewees, who had experiences with the Write a Science Opera method in Norway in 2015, were analyzed. Data collection and analysis was based on the Interpretative Phenomenological Analysis. Results show that the issue of effective dialogue between science and art practitioners and educators is perceived as central to successful realization of cross-disciplinary art and science projects in educational settings.

Key words: art, science, communication, dialogue, scientists, artists, educators.

1. Introduction

Art and science share many things in common, and it has been suggested that their relationship may best be described as a continuum rather than one in which the negotiation of separate domains is occurring (e.g.[13]). „Ironically, art and science differ most noticeably in the great trait they have in common: communication. While both art and science depend on successful communication, they differ in the direction in which they are communicating, as follows: Science begins with the physical, observable, the concrete occurrences in the world, and scientists generate abstractions that communicate their understanding of those phenomena. Artists begin with their abstract, often subjective perceptions, beliefs or feelings, and thereafter generate something specific and concrete based on those abstractions. Science creates new paradigms of thought and it is the process of creating an objective understanding of the world” [[10]]. The arts and sciences have the potential to develop new approaches by being implemented together in cross-disciplinary educational settings (e.g. [4]).

The Comenius project “Implementing Creative Strategies into Science Teaching” set out to develop practices and training materials based largely on cross-disciplinary thinking. One of the case studies was Write a Science Opera (WASO) (at Stord/Haugesund University College, Norway). WASO, as a meeting point of artists and scientists, also provides all stakeholders with an embodied and emotional understanding of the common impulses of science and art [[5]].

Our experience has pointed at a gap between the communication forms and styles of scientists and artists. We perceive this gap to be a result of several factors in addition to the different foundations of art and science as described above. The question of this research: *How can we characterize communication amongst professionals across disciplinary borders of art and science in an educational setting?*

2. Theoretical background

The communication process is a complex phenomenon which encompasses a number of components. In the communication process, a sender sends a fixed meaning to a hearer via the linguistic expression associated with that meaning. “On this account it is possible to objectively say what you mean, and communication failures are matters of subjective errors: since the meanings are objectively right there in the words, either you didn’t use the right words to say what you meant or you

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were misunderstood" [[8], p. 206]. Bakhtin [[1]] highlights: "The terminological imprecision and confusion in this methodologically central point of linguistic thinking result from ignoring the real unit of speech communication: the utterance. For speech can exist in reality only in the form of concrete utterances of individual speaking people, speech subjects [[1]]. Progressing from thinking to expressing (or utterance, according to Bakhtin), the following question arises: how does an artist and a scientist frame an idea, intercommunicate (it) and then communicate it to an audience? An artist uses a variety of tools such as words, sounds, visual images, signs/symbols, movements and melodies to communicate the particular message the creator wants to invoke. The scientist's communication with audience mostly consists of visual signs such as figures, tables, photos, maps and other conceptual diagrams.

Bakhtin has said, „[Dialogue] is the simplest and the most classic form of speech communication. The change of speaking subjects (speakers) that determines the boundaries of the utterance is especially clear here. But in other spheres of speech communication as well, including areas of complexly organized cultural communication (scientific and artistic), the nature of the boundaries of the utterance remains the same" [[1]]. In Bakhtin's approach to dialogue, the utterance interacts with several things simultaneously. Each utterance interacts with the speaker's past related traditions, while at the same time considering the listener's understanding, stance, etc. The possibility of the listener's understanding that utterance, however, requires that the people conversing share a context [[2]].

In realizing the inter-disciplinary art and science education, we are providing the context for individuals of different disciplines (science and art) to *converse*. According to Bakhtin, "complexly structured and specialized works of various scientific and artistic genres, in spite of all the ways in which they differ from rejoinders in dialogue, are by nature the same kind of speech communication." [[1]]. At the same time, the individuals from these differing domains are each interacting with their own past traditions. Indeed, Bakhtin wrote, Text lives only by making contact with another text (context) which in turn creates interaction between personalities. This represents the phenomenological view of communication as dialogue between self and others.

3. Research methodology

The research question fits within the strategy and intentions of the phenomenological research paradigm. And phenomenology is ideal for investigating personal experiences [[14]]. It is based on the philosophical works of Husserl, Heidegger and others [[3]] and seeks to reveal the essence of the phenomenon, which is unique and distinctive [[14]].

Phenomenology has many branches and deviations, among which is Interpretative Phenomenology Analysis (IPA), presented by J. A. Smith. "IPA combines an empathic hermeneutics with a questioning hermeneutics. Thus, consistent with its phenomenological origins, IPA is concerned with trying to understand what it is like, from the point of view of the participants, to take their side" [[12], p. 54]. The research was thus devised to understand the nature of the communication phenomenon driven from artists' and scientists' experiences of communication in educational practice. Communication and language are intertwined, and hermeneutics offers a way of understanding such human experiences captured through language and in context [[15]].

The research is based on phenomenological interview, which is used as a means for exploring and gathering of narratives of lived experiences. Interviews allow participants freedom to respond to questions, and to narrate their experiences without being tied down to specific answers. Also it is a vehicle which can be used to develop a conversational relationship with the participant about the meaning of an experience [[15]].

The interviews were conducted in January, February and August. Data analysis was based on IPA principles [[11]].

4. Overview of Research Findings

Research findings indicate the characters of dialogue between scientists and artists in the educational settings. We identified **four** major themes: *The difference in perspective; Art as a communication tool for science; Artists becoming better researchers through dialogue with scientists; Scientists becoming better communicator through interaction with Art*. We described these themes through two parallel dimensions: artistic and scientific experiences. In this article we present only the first theme.

4.1 The difference in perspective

Artistic thinking is born from inspiration and intuition which are often not bounded by factual and empirical evidence of the kind employed in science. Looking from an artistic perspective, communication with science starts with intuition and symbols culled from a variety of sources of

nature. Scientists examine problems from different angles and interpret scientific information/knowledge in a creative language. The artists are expressing both intuition and emotional concepts and perspective to seeing the scientific world in a different position than before. They indicate that art is much more than a *tool* in science. The personal contact/dialogue with science helps them to change their approach and look more deeply and widely into what is “going on” between science and art. While scientific thinking is a practical guide to inductive reasoning that implies the sort of reasoning that is commonly used in scientific activity such as performed by a scientist [[9]]. The scientist who works intuitively and expresses himself logically is in some ways an artist. However, differences exist: the scientist’s approach is more practical, and he looks to the art from a more pragmatic perspective. But they appreciated the value of the artistic activity for the increased understanding of the scientific content.

The scientist thinks methodically, using a set of principles, called the scientific method, to solve problems, often including the brainstorming of ideas about the current situation. Moreover, scientists seeking contact with an audience, they would like to engage in dialogue with an audience because they acknowledge that scientific language sometimes looks incomprehensible and boring.

There is evidence to suggest that, to a certain extent, communication in art and science is built upon different perspectives of thinking. It would seem that there are several areas in which scientists and artists have different communication practices, and which lead to differing perceptions within the interdisciplinary educational context. *Scientific* and *artistic* perception differences are not the only dimensions within which practitioners have different communication practices. It would, therefore, help to deepen our knowledge of the intersection between the disciplines.

5. Final Remarks

Language is a mediator [[7]]. As Hegel [[6]] wrote, language creates the way to know the community among all people, to understand the other and myself. The dialogue between arts and sciences should offer the needed skills towards developing clear messages, including the ability to communicate, solve problems, obtain and process information and analyze data in such a way that terminologies and approaches within both art and science are understood on both sides of the disciplinary borders. The role of communication is central to the successful integration of fields in cross-disciplinary work amongst science and art practitioners in educational settings. There is no aim of overly conflating science and art or to argue that artistic and scientific processes can be substituted for one another. We seek to note similarities between these two fields that have deep histories of shared understandings [[10]].

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