

EMOTION BEHIND THE MASK: A NEUROHUMANITIES EDUCATIONAL APPROACH TO JAPANESE NOH THEATER

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Abstract

Neurohumanities refer to the field that studies how cultural artifacts shape human neural perception. In this theoretical proposal, we map out in a lesson plan how Japanese Noh Theater masks connect to embodied cognition and affect. The scope of this educational intervention is to consider the impact of the introduction of neurohumanities on interdisciplinary thinking in undergraduate education. Through a series of learning activities, students will be able to interact with historical objects and identify their neural signature in the living human brain (namely, brain structures involved in processing Noh theater masks), as well as their literary imprint, thereby gaining an understanding of the relationship between neuroscience and culture. The teaching intervention is aimed at higher education; to be held on the World Theater Day (27th of March) and is intended for university students in the sciences and the humanities. This is a three-fold intervention: first, students will be introduced to the field of neurohumanities and its implications to neuroscience and cultural forms literacies. Second, a Noh Theater mask workshop will take place, drawing on digital and analog artifacts. Lastly, in the context of theory and criticism of literature, the interplay of reading, storytelling, creativity, empathy and memory are explored. Assessment will take place via a content knowledge challenge and an evaluation report focusing on student experience. This educational approach promotes interdisciplinary thinking, neuroscience literacy, intercultural understanding and cognitive empathy.

Keywords: *Neurohumanities, neuroscience, Noh theater masks, theory and criticism of literature, higher education.*

1. Introduction

Neurohumanities is an emerging, interdisciplinary field that bridges neuroscience with the humanities, aiming to explore human experience by linking the arts, culture, aesthetics, and history with neural processing (Carew, 2020). The Noh theater, one of the most prevalent art forms in Japan, uses distinctive face masks whose vivid expressions reflect cognitive brain processes (Homma, 2006). Functional Magnetic Resonance Imaging (fMRI) studies have demonstrated that observation of Noh masks results in right amygdala activation (Osaka, 2012). Moreover, observation from a varied angle perspective may elicit an illusion of varied expression (Lyons, 2000). These findings suggest that, aside from being a valuable historical artifact, Noh masks represent affect and embodied cognition and may promote observer empathy. The proposed lesson plan that may take place on World Theater Day (March 27th) investigates the interplay between neuroscience and the humanities. This lesson aims to offer a cultural perspective to science students and a neuroscientific background to students from the humanities.

2. Methodology

Subject: Neuroscience and the Humanities – Topic: Noh theater masks– Age group: Higher education students – Duration: 2 hours.

2.1. Educational goals

By the end of this lesson plan, students will be able to: (1) Bridge two academic fields (i.e. cognitive neuroscience and the humanities) and explore interdisciplinary interactions, (2) Appreciate the cognitive effect of Noh masks, (3) Improve their oral, writing and communication skills, (4) Advance their media literacy and literary analysis, (5) Identify neural correlates of emotion and neural processes, (6) Promote intercultural literacy.

2.2. Materials

Projector, 3D printed masks, table lamps, classroom with internet access.

2.3. Procedure

This lesson plan comprises three activities and an evaluation phase. The duration of the lesson is approximately two hours in total.

2.3.1. 1st Activity – Introduction to Neurohumanities (Duration: 35 min). Introduction to the implications of Noh theater performance on neuroscience and cultural forms literacies.

1. Warmer: Students are introduced to Noh theater performances by means of a video documentary by the Museum of Fine Arts in Boston (<https://www.youtube.com/watch?v=xRL6FujVDAs>) (duration: 12 minutes).
2. Students are presented with video excerpts and record the different emotions that the masks convey. Then, they are introduced to basic neuroscience terms that are relevant to Noh theater. More specifically, the role of brain's amygdala in emotion processing is discussed, particularly its involvement in processing social cues and perceived threats.
3. A plenary discussion will be carried out, focusing on how Noh masks limit vision (Salz, 2010), forcing the actor to rely entirely on balance to navigate the stage. The lecture will conclude by discussing the concept of neuroplasticity. The instructor explains how decades of repetitive, slow-motion training physically re-wires brain's motor cortex (Mawase, 2017), allowing the performer to achieve the "*Hana*", i.e. the ideal of aesthetic beauty (de Boer, 2025).

2.3.2. 2nd Activity – Shadow Play Workshop (Duration: 40 minutes). Explaining how Noh masks engage neuroscience processes.

1. During the workshop, the class is divided into groups of 4-5 people. Each group is provided with analog and digital Noh masks, asked to interpret the emotional tone expressions formed under different lightings and angles.
2. Students are asked to interpret why the emotional experience in the Noh theater feels so intense and subjective, in connection with the above point.
3. Groups present their findings to the class, and the instructor answers potential questions that might arise (answer: face perception processing and high cognitive load contribute to heightened emotional interpretation).

2.3.3. 3rd Activity – Literature Analysis (Duration: 35 minutes). Analyzing excerpts from a classical Noh play to interpret the function of the protagonist mask transformation.

1. Students are introduced to a famous Noh play called "*Atsumori*" and are provided with necessary vocabulary and definitions; *Teru* (bright/sunny) and *Kumoru* (cloudy/dark) are terms used to refer to techniques used for manipulating the Noh masks expressions through lighting and angle.
2. It is explained that by tilting the mask up (*terasu*) or down (*kumorasu*), performers create subtle changes in emotion, often turning a neutral mask into one that smiles or shows sadness (Miyata, 2012). Then, students are asked to identify metaphors in two curated text excerpts (<https://drive.google.com/drive/u/3/folders/144rczKNnrV-gw9Ar5OBjzU9TH9k1N2T3>) that mirror the physical "tilting" (*kumoru* and *teru*) of the mask.
3. Students are asked to think about the reason why a static object, like the mask, is interpreted by the brain as a non-static object and as a result this is interpreted as emotion (answer: predictive coding and embodied cognition are at play). The mirror neuron system is explained, and how this affects embodied empathy.
4. Finally, students are required to draft essays on the meaning of the play "*Atsumori*", analyzing the interactions of storytelling, creativity, empathy and memory.

Figure 1. Japanese Noh theater masks. (a) Exhibit in the Tokyo National Museum, Tokyo, Japan. This work is in the public domain., (b) Image licensed under the Creative Commons Attribution 4.0 International license (<https://creativecommons.org/licenses/by/4.0/deed.en>); no changes were made. Source: ColBase-Integrated Collections Database of the National Museums, Japan.



2.3.4. Evaluation (Duration: 10 minutes). The effectiveness of the proposed lesson plan is assessed through a content knowledge challenge and an evaluation report. More specifically, students are asked to respond to the following questions: “Which brain processes are relevant to Noh masks’ uncertain expressions?”, “How did the masks make you feel?” and “Which specific element of Japanese culture that you learned today surprised you?”.

3. Discussion

The proposed lesson plan employs the Noh Theater in the framework of neurohumanities, aiming to promote interdisciplinary thinking by bridging the gap between neuroscience and cultural heritage. By addressing embodied cognition and empathy, the theoretical proposal in this lesson plan aims to increase student motivation and participation.

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