Science Learning Through Embodied Performances in Elementary and Middle School

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To watch a videoclip and see an image, please scroll down to the right area of the poster section where additional files are located.

Findings
- Forms of Embodied Generative Engagement
  - Enactments as spaces of question generation (Closed and Open Circuits Videoclip; Gases and How They Become Solids Videoclip)
  - Enactments as places of collaboration (Filteration to Clean Water Videoclip)
  - Enactments as enhanced performances after revision (Water Videoclip)
  - Enactments as generating multiple dimensions and connections (Impact of Air Pollution on Human Body Videoclip)
  - Enactments as showcasing representational diversity (Planets Videoclip)
  - Environments in home settings (Life Cycle Videoclip; Plant Growth Videoclip)

- Teachers’ Roles in Enacting
  - Leading theater games (How Air Sounds Videoclip)
  - Encouraging enactment and narration (Weathering Videoclip)
  - Developing capacity for movement-building body skills (Stretching to Get Ready Videoclip)
  - Connecting students’ ideas (Viscous Liquids Videoclip)

- Identity Performances and Narratives
  - Identities in practice (Being a Chef Videoclip)
  - Narrated identities (Understanding More by Moving Videoclip; I Like Doing Enactments Videoclip)

- Project STAGE Theoretical Frameworks
  - Social semiotics and multimodality (Spool, 2004; Besse & van Leeuwen, 2001; Varelas, et al., 2003)
  - Embodied mind and dramatizing (Skinner, 1984; Ryley, 2010; O’Herron & Post, 2015; Henry, 2005; Nagel, 2013; Varelas et al., 1991; Warren et al., 2003; Wun, 2009)
  - Master narratives and control of bodies (Culwee, 2014; Burns & Ros, 2016; Espinosa & Vergara, 2010; Freire, 1987; Varela, & Hoshal, 2015; D. Varelas, 1994)
  - Expansive science learning (Cullnado, 2002; Meckley & Molcikofsky de Rappaport, 2005; Varelas, et al., 2012; Varelas, 2009; Varelas, et al., 2017/18)

- Data Sources
  - Lesson recordings and fieldnotes
  - Lesson artifacts (student work, teacher lesson plans)
  - Recordings and writings on identity reflections
  - Teacher meeting recordings

- Project STAGE Focus
  - We call our project STAGE (Science Theater for Advancing Generative Engagement) to bring together sciences, identities, literacies, and theater.
  - The focus is on...
    - Making embodiment an integral part of learning science in elementary and middle school classrooms
    - Exploring the affordances and challenges in doing that in classrooms of students of color and other marginalized groups including multilingual learners

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- Project STAGE Design Highlights
  - Body being a place of sensing science ideas and dramatizing science ideas taking on roles of science entities in micro and macro levels
  - Disciplinary knowledge of science education and literacy education being meshed within theater practices and ways of knowing the world
  - Working with teacher colleagues and teaching artists to design performances for classrooms that took two broad forms: classroom-based work (Teacher Talk Videoclip) and science plays developed for larger audiences (Science Play Videoclip)
  - This year (and part of last year), due to the COVID-19 pandemic, classroom-based work mostly happened in the context of remote teaching, and science plays in the form of digital-media productions

- Project STAGE Study Highlights
  - Our design and analysis has been centering on how science ideas are represented through movement and performing (individually and in groups) and emerging
  - Multiplicity of meanings and relations between movements and movements
  - Generativity of embodied performances
  - multimodal literacies involved
  - How science ideas are constructed and reconstructed during such experiences

- Analytical Steps
  - Summarizing lessons—1st pass in capturing both unfolding of a lesson and enactments taken place, and identify moments, students, interactions/engagements with the project focus
  - Deepening analysis by...
    - watching back interesting excerpts
    - focusing on science learning, multimodal literacies, and identity construction
    - examining other lesson artifacts (e.g., notebooks)
    - conducting multimodal discourse analysis, LBMS movement analysis, content analysis

- Citing Ideas for Multimodal Discourse Analysis

- What is it?
  - Speech
  - Written language
  - Visual image
  - Transduction
  - Emotions expressed
  - Spatial relations (e.g., body moves, spatial layout)
  - Language reference
  - Intercultural meaning

- Feedback processes
  - Alignment with scientifically accepted idea
  - Change over time

- Theater Practices
  - For developing capacity for movement, and for expressing and advancing ideas through movement, artists’ primary tools (and associated skill are)
    - Body skills: gestures, gesture awareness, gesture training
    - Movement skills: movement vocabulary
    - Voice skills: channeling, narrating, singing
    - Imagination: skills: engaging, role play, viewpoint, cross-cut, change, scale, take a perspective

- Quotations
  - "naming game, theatre games, ensemble work, matching & harmonizing"

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  - Teaching Arts
  - Graduate Research Assistants (Education)
  - Undergraduate Research Assistants (Teacher and Education)
  - Ph.D. (Education/curriculum & Instruction, Teacher)

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