Tale of Two Thinking Systems (ToTTS):

The initiative for teaching and learning art and science in the ways that brains work

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CDASH
Curriculum Development in the Arts, Sciences, and Humanities

CDASH is a compendium of art-science courses that allow for the study of the international impact of art-science teaching and provide a platform for instructors of art-science curricula.
https://cdash.atec.io/
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TASTA
TAlk Science Through the Arts

TASTA is an exploratory study to develop an innovative STEM educational program based on transdisciplinary collaboration and mentoring. TASTA consists of mentor-training programs offered to undergraduate students, graduate students and teachers in the spring semester, and summer workshops for young students (grade 6-10). https://cdash.atec.io/tasta-talk-science-through-the-arts/
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TICITA
Teaching Creativity and Innovation Through the Arts

TICITA focuses on;
- Creating a curriculum to teach innovation and creativity through the arts – especially to STEM and business students – in the required standard arts appreciation course for college Freshmen
- Obtaining the scientific evidence that such an approach enhances innovation and creative thinking
https://cdash.atec.io/teaching-creativity-and-innovation-through-the-arts/
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Tale of Two Thinking Systems (ToTTS)

WHAT is ToTTS?
- ToTTs is an initiative to teach and learn art and science in the ways that brains work.
- Art-based teaching of science or science-based teaching of art can encourage multi-layered thinking systems in our brains.
- Examples: Activating multi-modal sensory systems, engaging attention using novel and incongruent concepts or learning to take divergent paths of cognitive processing.
- This transdisciplinary teaching will bring more fruitful learning outcomes because it helps facilitate the way that our brains work.

WHY ToTTS?
- Previous studies suggest different ways of "thinking," for example, one is fast, intuitive and implicit thinking and another is slow, reason based and explicit thinking
- Traditionally, teaching science mainly focuses on slow, reason-based, and explicit thinking, while teaching art usually encourages fast, intuitive, and implicit thinking.
- This traditional pedagogical approach might not optimize the utility of how our brains actually work according to contemporary cognitive science.

HOW does ToTTS work?
- We have been developing and implementing programs, courses, and studies to pursue this transdisciplinary teaching and learning.
- Each program has or is developing an evaluation plan, and a large-scale evaluation will be developed also.
- We are currently planning to launch a large-scale initiative throughout the campus and toward extended communities.
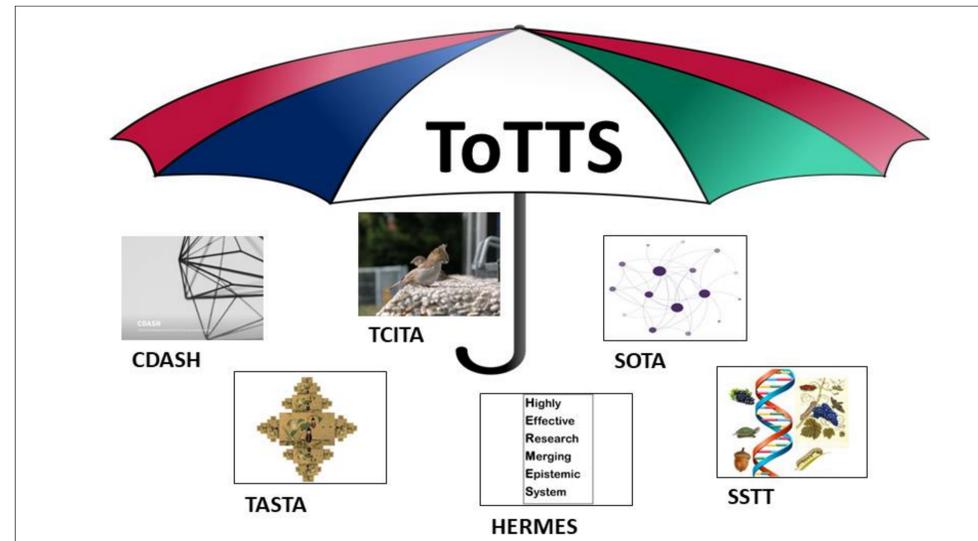

Figure 1. The Structure of the ToTTS Initiative

WHO work for ToTTS?

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Physics
Distinguished Professor of Arts and Technology

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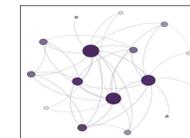## HERMES
Highly Effective Research Merging Epistemic Systems

(Highly Effective Research Merging Epistemic Systems)

- Project HERMES looks at how researchers and expert practitioners work together in interdisciplinary (across institutional departments) and transdisciplinary (across stakeholder communities) contexts through the framework of Transdisciplinary Intelligence.
- HERMES is currently underway internally at the University of Texas at Dallas among its 100+ research groups and will expand to industry partners in 2020.
- HERMES will become the basis of transdisciplinary training for graduate students.
https://cdash.atec.io/hermes-transdisciplinary-training-of-graduate-students/
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SOTA
Students Older Than Average/ The Salon

- SOTA offers aid to students returning to college from a wide variety of experiences to re-introduce them into the student community.
- The Salon concentrates on gathering students to socialize, discuss a variety of topics, enjoy good food, and spend an enjoyable evening together.
https://cdash.atec.io/sota-students-older-than-average-and-the-salon/
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SSTT
Study the Students, Teach the Teachers

- SSTT is a study using arts-based workshops as an intervention to enhance thinking skills in both high school and college student populations, and informing teaching practices.
- SSTT also aims to develop new evidence to guide arts integration in STEM to STEAM on a large scale.
https://cdash.atec.io/study-the-students-teach-the-teachers/
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