



ArtSci

A method based on the interaction between art,  
science and technology



ArtSci

## **GOALS**

To train young researchers and entrepreneurs to be creative,  
critical and capable of solving complex problems

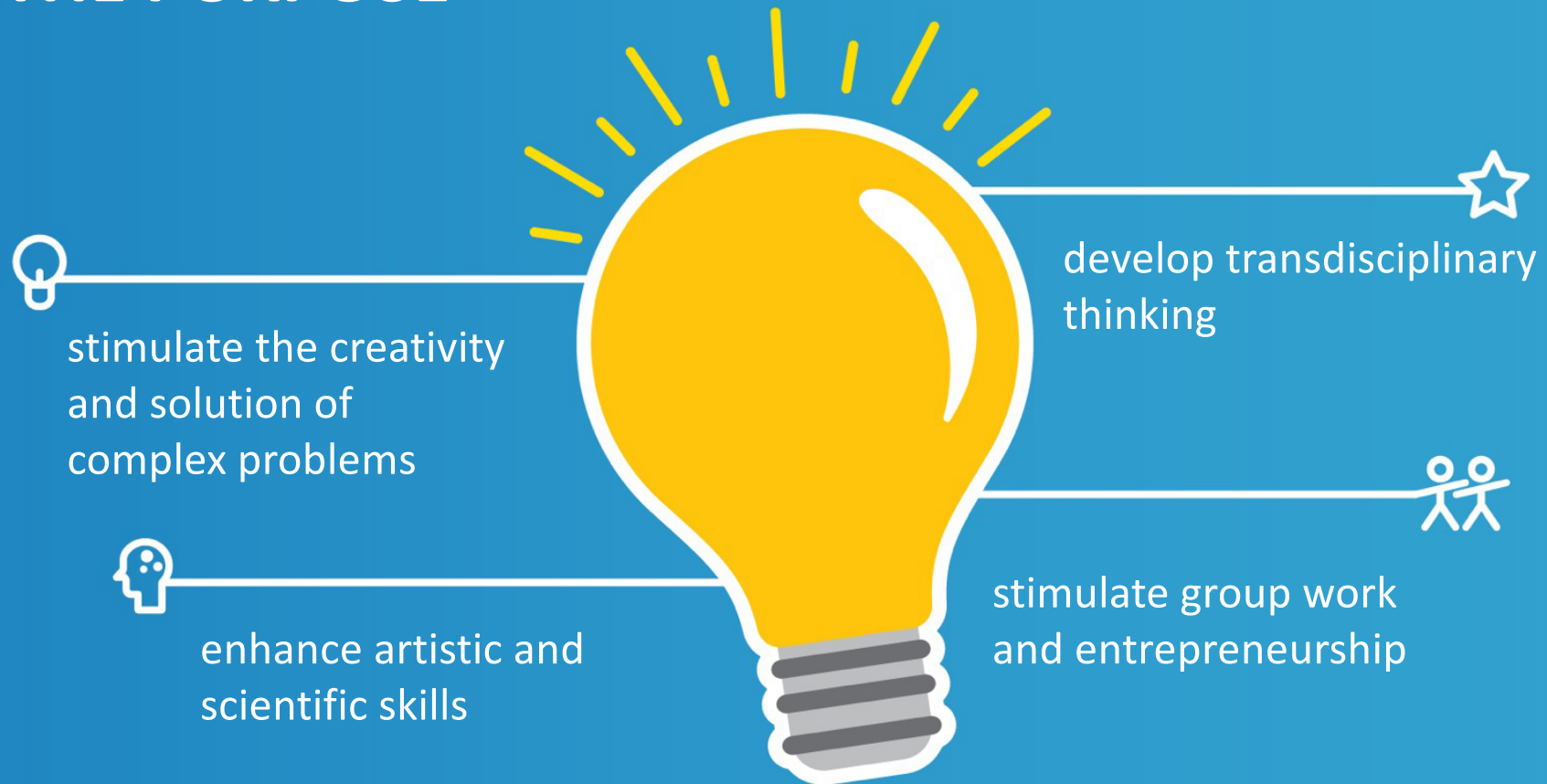
## **TARGET AUDIENCE**

middle and high school students



ArtSci

# THE PURPOSE





# HOW IT WORKS

Problem based learning + Artscience



scientific topic  
e.g:  
neurological  
diseases

+

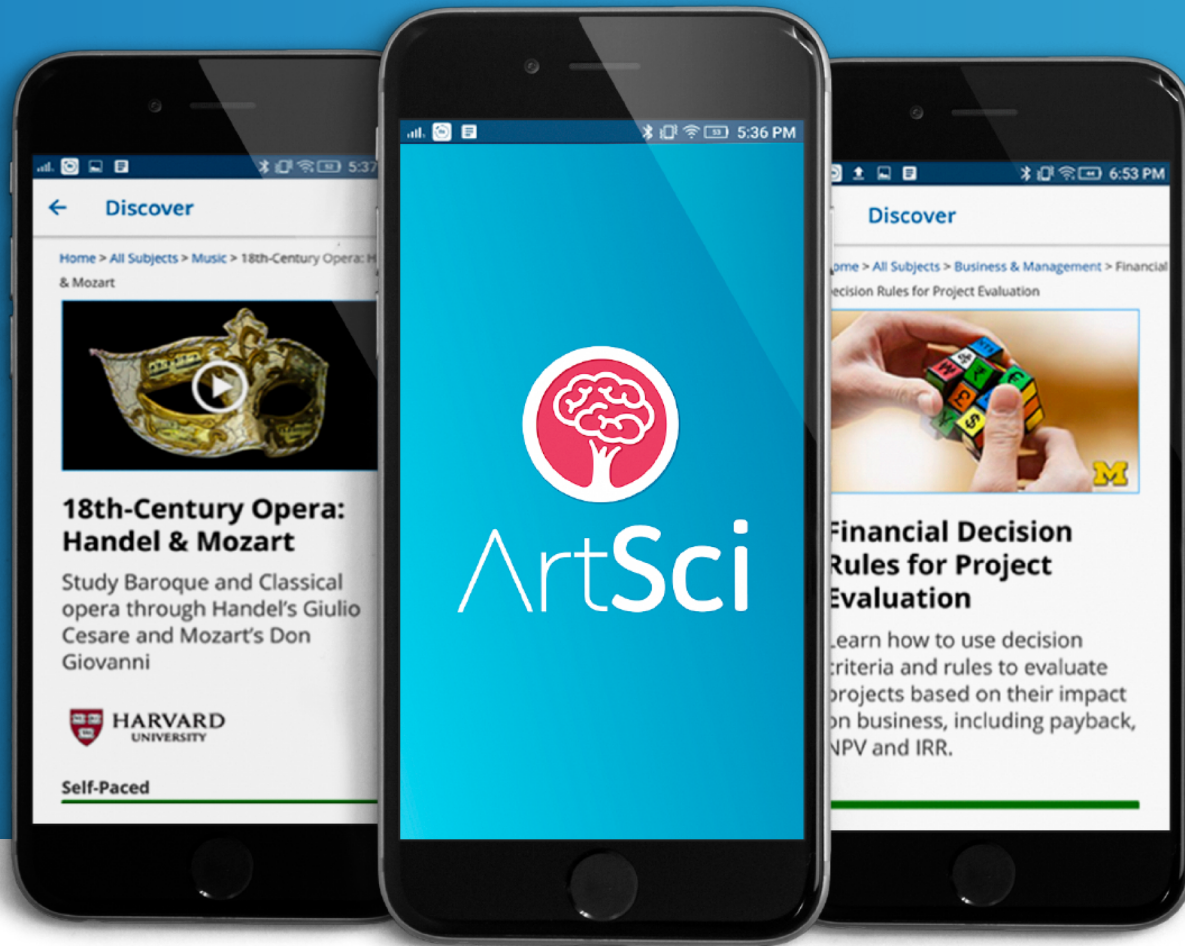


artistic area  
e.g:  
theater or  
drawing

=



artistic learning  
scientific learning  
new ideas



- basic guidelines
- report on each step of the process
- share experiences during the process







**CREATED AT HARVARD  
AND IMPROVED IN BRAZIL**



**HARVARD**  
UNIVERSITY

# OUR EXPERIENCE

more than 10 articles published in specialized magazines + practical experience outside the academy



**Da Ideia ao Aplauso - O passo a passo da criação de um espetáculo de dança e música inspirado em um tema de ciências**

by Joao Silveira e CRISTINA MAIA

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Creative connections are so essential to the innovation model that organizations considered know... more

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**What Is the Evidence that Art-Science-Technology Collaboration Is a Good Thing?**

by Joao Silveira and Alex Garcia Topete


IN RECENT YEARS, the subject of integrating arts, design and the humanities into the STEM discipl... more



**Arte e ciência no SciELO: estudo de resumos de artigos que utilizam as palavras "ciência" e "arte" no Brasil**


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**A CIÊNCIA E A POÉTICA DO MOVIMENTO: ULTRAPASSANDO AS FRONTEIRAS DO CONHECIMENTO EM UMA PRÁTICA EDUCACIONAL FORA DO COTIDIANO ESCOLAR 1**

by Joao Silveira e Ericka G Telles



**Ciência e arte em linguagem metafórica: o conhecimento científico aberto a subjetividades e a práticas interdisciplinares**

by CRISTINA MAIA e Joao Silveira

Esta trabalho relata a criação e o desenvolvimento de um espetáculo de dança e



**An emerging role for design methods in transdisciplinary practice**

by G. Mauricio Mejia, Alex Garcia Topete, andres roldan, Priscila Farias, R0 Joao Silveira

This paper is a follow up to some of the authors' ISEA 2017 paper "Towards an

EDITORIAL

## What Is the Evidence that Art-Science-Technology Collaboration Is a Good Thing?

IN RECENT YEARS, the subject of integrating arts, design and the humanities into the STEM disciplines (science, technology, engineering and math), often referred to as "STEM to STEAM" in the U.S.A., has gained traction. Using the insertion of the catchall "art" to represent multiple disciplines in the acronym, STEAM has been growing in policy, education and business debates around the world. The E.U. STARTS program, Science Technology and the Arts also promotes this approach. The current discourse in business regarding "T-shaped" professionals echoes this discussion. We are witnessing a multi-century articulation between disciplinary and multi-disciplinary approaches, previously targeted via historic studies, integrative studies, creative industries and so on. More recently the argumentation of R0 Mitchell et al's National Research Council (NRC) report "Beyond Productivity" Today, the core question is: What evidence exists of benefits from such integration or collaboration?

Different stakeholders obviously seek different evidences. Robert Root-Bernstein has summarized the evidence that since mid-century artists and engineers have intersections in the arts in greater proportion to those often concerned purely. Sometimes these correlations are clear, but the routes of causation lie close. Within the educational literature the evidence for near-and-distant skill transfer remains debated. Kathryn Evelyn's recent comprehensive study on STEM majors' take-up, and second-degree courses reflections these debates.

Another simple piece of evidence is "examples," or put more word, high-quality examples of work demonstrating benefits of the disciplinary combination that led to their creation. For instance, the collaboration between a geologist and designer who were educated as architects. Their findings moved back the animal fossil record more than 90 million years before the ice ages and suggest that some animals thrived survived the "snowball Earth." A simple kind of evidence, for example, is the growing number of patents filed by artists or with artists.

The STEAD Exemplars project aimed to collect and catalog a diverse array of examples. Covering a range of transdisciplinary projects, with the purpose of presenting them as evidence often-offs, effects and outcomes of STEM to STEAM practices. We have relied on the nominations of professionals who are known for relevant work, respected among their peers and appropriately credentialed. More than 100 examples were submitted by a nomination during a month call. Collaborators analyzed these exemplars according to disciplines, demographics, work models and funding sources. The result is a curated showcase of exemplars, diverse in geography, practice and discipline, displayed in an online exhibit and printed for gallery exhibition. (See the Exhibit published in this issue with the report's Executive Summary, and the online supplement with the full report.)

These exemplars—ranging from visual art and storytelling experiments to robotics and individuals' career portfolios—arguably show that intersections among STEAD disciplines can contribute significant advances for sustainable agriculture, in finance, transportation and also communication technologies, create novel educational practices, humanize medicine and scientific practice (or approaches), promote new expert insights about human brain functions and foster peace in real-world conflict zones. The exemplars offer specific evidence that transdisciplinary collaboration is not the exception to the traditional rules of scientific research, technological innovation, art practice or academic inquiry but has emerged as a discrete paradigm in need of its own definitions, rules and recognition.

Over its 50-year history, Leonardo has now published the work of over 10,000 professionals in art-science-technology practice. We are gathering evidence that such practices, through a variety of methodologies, contribute to a healthier development of our societies. This kind of work should actively and intentionally be supported not only to advance knowledge about the world, but also drive the redesign of our culture.

ROGER F. MALINA  
Executive Editor  
Email: [rmalini@leonardo.mit.edu](mailto:rmalini@leonardo.mit.edu)

ALEX GARCIA TOPETE  
Eugene McDermott Graduate Fellow PhD candidate in Arts & Technology, The University of Texas at Dallas  
Email: [alex.garcia@utdallas.edu](mailto:alex.garcia@utdallas.edu)

JOÃO SILVEIRA  
Harvard Research Fellow PhD candidate, Federal University of Rio de Janeiro  
Email: [csilveira@igmp.ufrj.br](mailto:csilveira@igmp.ufrj.br)

Note  
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2 | LEONARDO, Vol. 31, No. 1, p. 0, 2018

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# VALUES



art  
science  
+  
innovation



valorization  
of the  
process



stimulation  
of the  
creativity



critical and  
complex  
thinking



Enhance  
the teacher

[www.arteciencia.net](http://www.arteciencia.net)  
[contatoarteciencia@gmail.com](mailto:contatoarteciencia@gmail.com)

Rio de Janeiro  
Avenida Marechal Floriano, no 143, sala 201, Centro

Boston  
125 Western Ave, MA 02134

Phone: +55 21 3942 7789



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