

**KNUE UNESCO-UNITWIN**

**Situating STEAM Education within  
Critical Discourses for the Sustainable Future**

Jung, Eun Young  
Department of Art Education  
Korea National University of Education

## Purpose

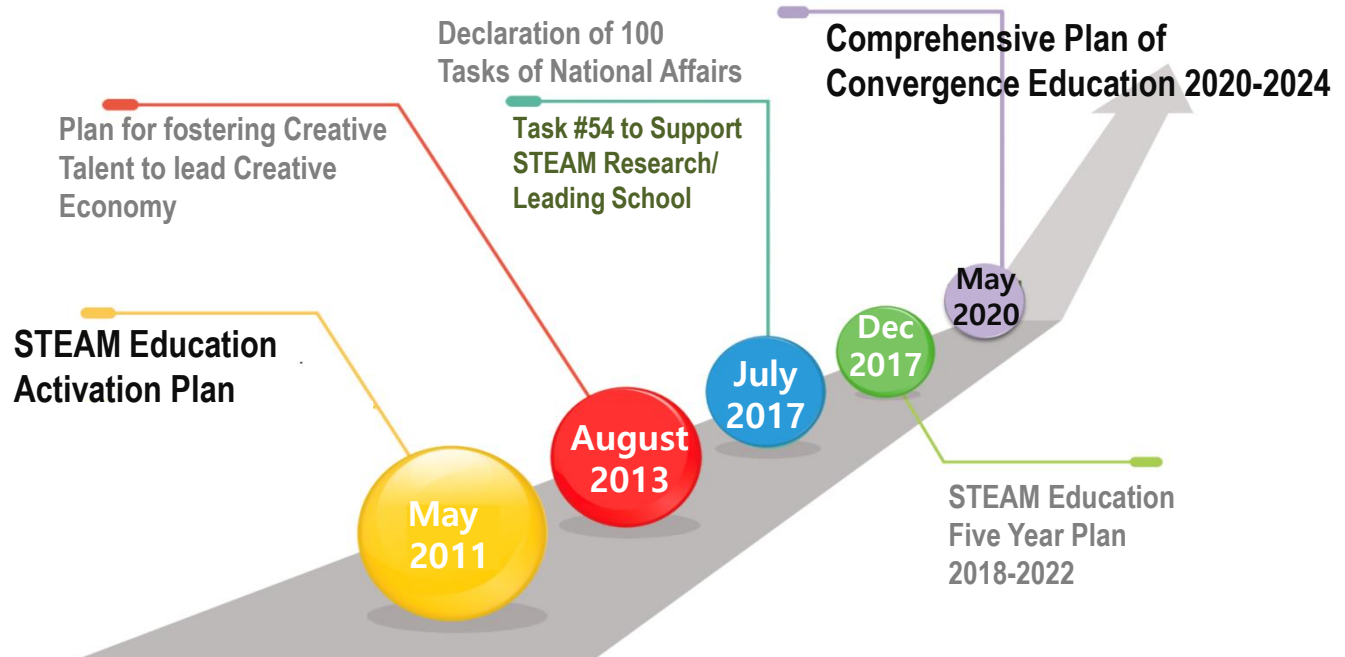
- The purpose of this presentation is to introduce contemporary critical discourses discussed in sciences and arts/humanities into STEAM teachers training, and to situate STEAM as real-life convergence education so that it can serve as education for the sustainable future.
- It ultimately aims to build a better understanding of STEAM education within a larger context of UNESCO SDG (Sustainable Development Goals) and promote mutual cooperation among KNUE UNESCO-UNITWIN partners on convergence education for our future generations.

## Contents

- I . STEAM Framework and STEAM Teachers Education in Korea**
- II. Critical Discourses of Anthropocene and Posthumanism for STEAM Teachers Education**
- III. STEAM for the Sustainable Future**

## STEAM Education in Korea

Over the last decade, STEAM has been increasingly taught in many countries in both regular school settings and extra-curricular learning activities. In Korea, since it was introduced in 2011 with the implementation of STEAM Education Activation Plan, it has been gradually expanded in scope and depth.



\* Source: [steam.kofac.re.kr](http://steam.kofac.re.kr) KOFAC (Korea Foundation for the Advancement of Science and Creativity)

# STEAM Learning Standards Framework

KOFAC developed the 'learning standards framework' of STEAM for teachers to create lesson plans and achieve the goals of STEAM more effectively.



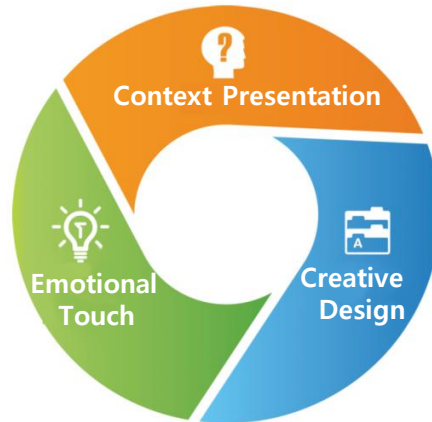
Must include two or more subjects among S, T, E, A, and M



Any subject may be the focus, but must include the content to increase the interest and understanding of science and technology



Must be conducted with the [STEAM learning standards frameworks](#)



## Context Presentation

to let students recognize problems related to real life



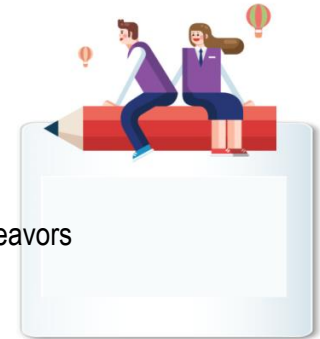
## Creative Design

to facilitate students to solve the problems with creative endeavors



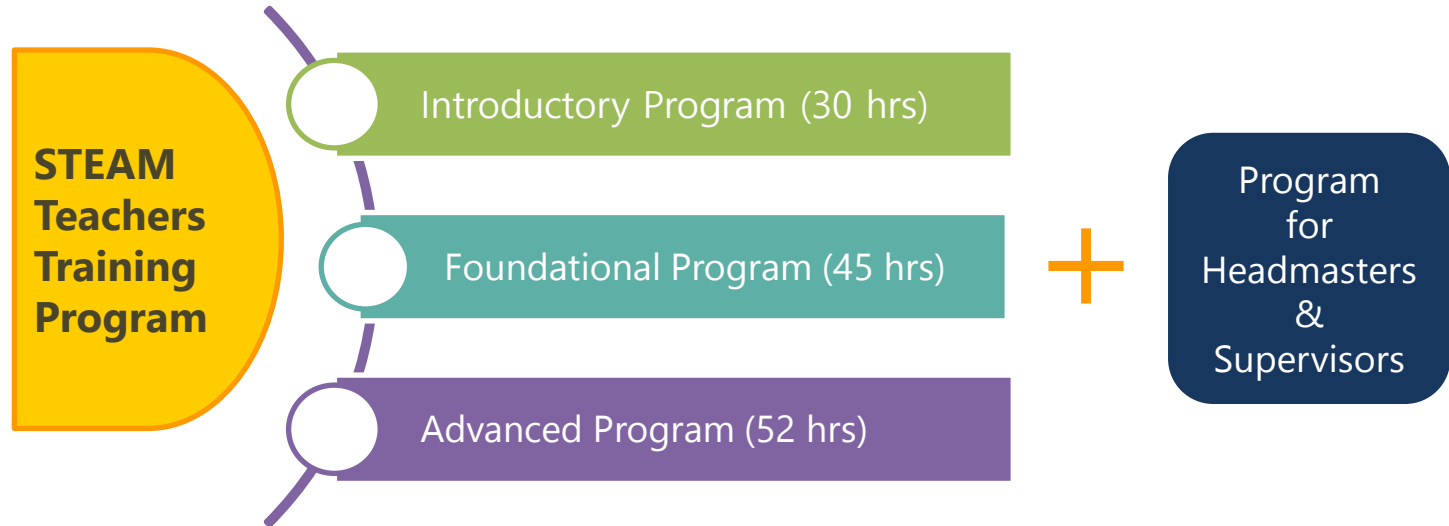
## Emotional Touch

to infuse students with interest and motivation to learn by trial and error and take on new challenges



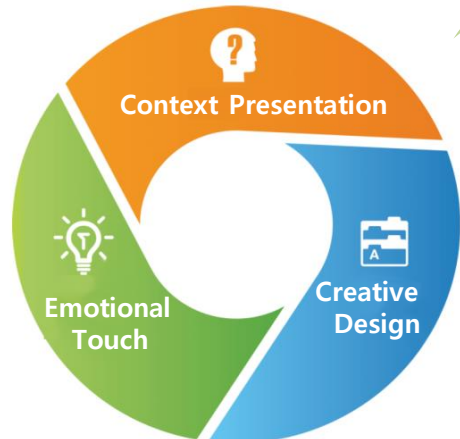
## STEAM Teachers Education System

KOFAC have also made efforts by providing STEAM teachers training, STEAM leading groups support, and various research/communication platforms to implement STEAM in school education. STEAM teachers training, in particular, can be the most important facet of all, since it serves to enhance the educators' competencies for interdisciplinary content knowledge and effective pedagogical methods; it is like a rich soil for STEAM education to grow, flourish, and bear meaningful fruit in learners' life and society in general.



## STEAM Teachers Education System

While STEAM framework is highly useful in terms of providing a well-structured overview of STEAM program as integrated learning, and STEAM Teachers Education provides a solid foundation for STEAM to expand, it is really necessary at this point to think seriously about the goals and purposes of STEAM education and to situate them within contemporary critical discourses for the sustainable future.



STEAM Learning Framework

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STEAM Teachers Training

**Inquiries about Real-life  
problems and  
human/Environmental  
conditions**

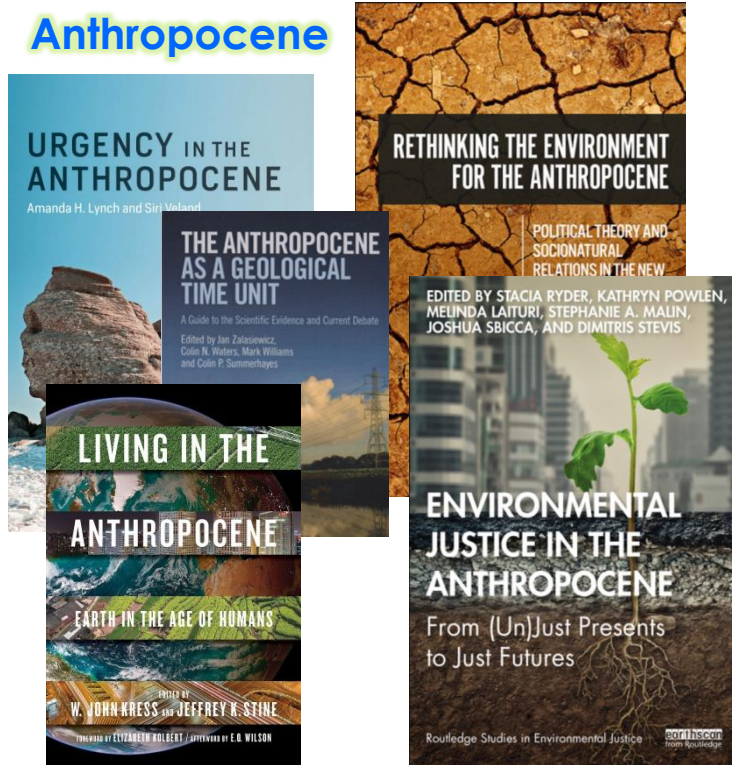
# II

## Introducing Contemporary Critical Discourses

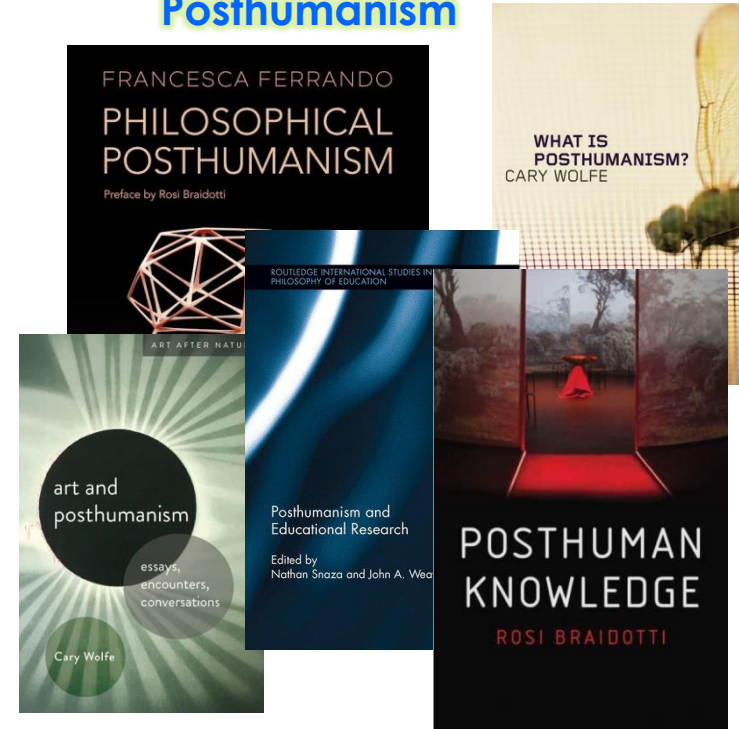
### Critical Discourses of Anthropocene & Posthumanism for STEAM Teachers Education

I suggest, in particular, the notions of the anthropocene and posthumanism, as two distinct yet interrelated discourses we may introduce into STEAM teachers training in order to conceptualize and practice STEAM as education for the sustainable future.

#### Anthropocene



#### Posthumanism

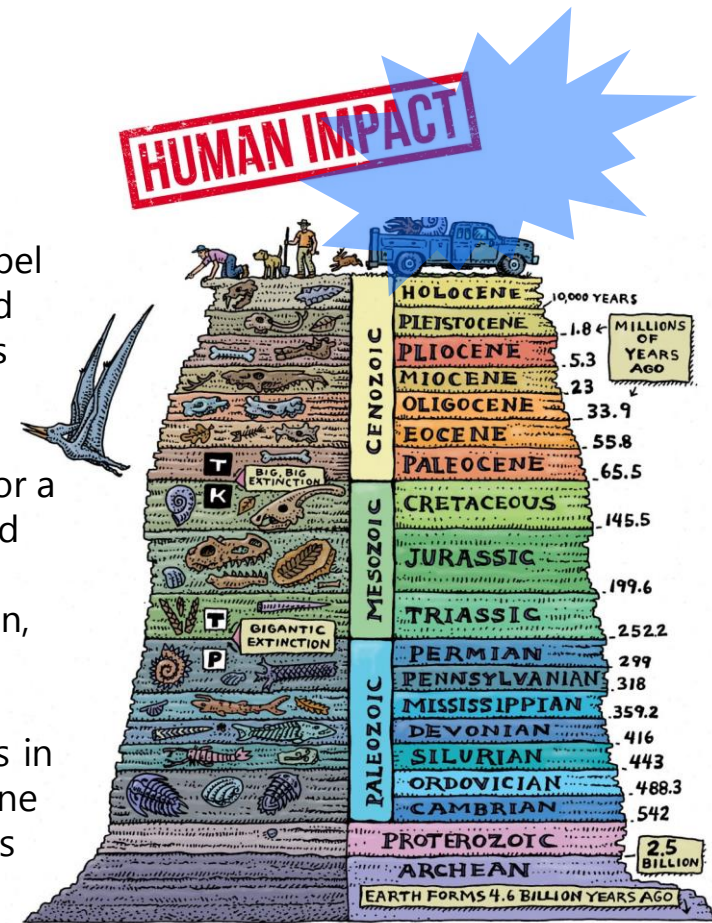


# II

## Anthropocene

scientific discourse

- ▶ proposed and popularized by Paul J. Crutzen, a Dutch scientist who earned a Nobel Prize in 1995 for work that warned the world about the threat of chemicals to the planet's ozone layer
- ▶ "the age of humans" - a term proposed for a new geological epoch during which mankind has made a substantial impact on the Earth System (Crutzen and Stoermer, 2000; Crutzen, 2002; Leinfelder, 2013; Steffen et al, 2018)
- ▶ suggesting that human-induced changes in the earth system were so profound that one could speak of a new epoch in the planet's history; we are no longer living in the Holocene

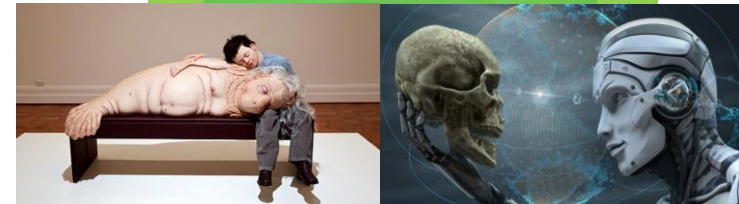


# II

## Posthumanism

philosophical/cultural discourse

- ▶ a philosophical perspective / cultural discourse which is critical of the traditional assumptions of humanism/human nature and examines the ethical, environmental implications of extending subjectivities beyond human species (Hayles, 1999; Wolfe, 2010; Taylor, 2017)
- ▶ encompassing trans-humanism and post-humanism, two different types of posthuman theories, but both assuming the human as part of larger technological or ecological system
- ▶ a critique of human-centric belief in the unique value, agency, and supremacy of human beings



# II

## Critical Discourses for STEAM Teachers Education

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### Critical Discourses of Anthropocene & Posthumanism for STEAM Teachers Education

- ♣ Though it is debatable what the Anthropocene really means, when it began, and whether the earth has actually entered a new epoch following the Holocene, its conceptual core is the awareness that human action has become arguably the most important driver of change on the planet Earth.
  
- ♣ Likewise, though posthumanism is more like a discursive constellation made up of different theories, agendas, and practices, it suggests a new mode of coexistence of humans and nonhumans.

# II

## Critical Discourses for STEAM Teachers Education

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### Critical Discourses of Anthropocene & Posthumanism for STEAM Teachers Education

- ♣ By questioning the human as separate, privileged category of being independent from nature, these discourses make it necessary for us to work together to create a world that is sustainable not only locally and globally, but on a planetary scale, for the future generations.



\* Source: <https://en.unesco.org/themes/education/sdgs/material>

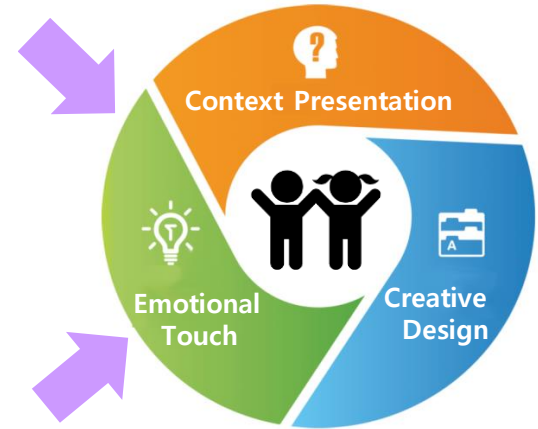
## STEAM for the Sustainable Future

- ♣ Critical discourses of anthropocene and posthumanism are basically inter- and trans-disciplinary across science, technology, humanities, and arts; having significant implications for STEAM and STEAM teachers education.
- ♣ The critical discourses may serve as foundational theories or perspectives for STEAM educators to conceptualize, develop, and practice STEAM education; they can be effectively related to UNESCO's Education for Sustainable Development (ESD), a key element of the 2030 Agenda for Sustainable Development.



## STEAM for the Sustainable Future

♣ By setting the goal of STEAM as learning about the state of the Earth and acting for the sustainable community-society-world-planet, STEAM educators would be able to weave scientific knowledge, social/historical awareness, and critical/creative responses into truly integrated, trans-disciplinary, active learning.



\* source: KOFAC STEAM guide for teachers (2018)

