PHILIPPINE STEAM EDUCATION IN FOCUS POLICY BRIEFING

Research and Analysis from
TPACK in Philippine STEAM Education Program

CHED-PNU TPACK STEAM EDUCATION

The Philippine STEAM Education through the Lens of TPACK framework

The Philippine effort towards the Fourth Industrial Revolution era (FIRe) foresees STEAM (Science, Technology, Engineering, Agri-Fisheries/Arts, Mathematics) professionals to be at the forefront. This IR4.0 phenomenon created a disruptive transition towards Education 4.0 to improve country metrics such as global innovation index (GII), research and development, and low quality of tertiary education leading to skills-job mismatch (Licuanan, 2017). However, a minority of data and studies focus on STEAM education in the country from which to source information for policies and programs that will alleviate the Philippine STEAM Education, Thus, this brief reports the pursuit to view, and model the Philippine STEAM Education through the lens of TPACK (Technological Pedagogical Content Knowledge) framework.

At a glance

The major frameworks (Commission on Higher Education [CHED] Policies, Standards and Guidelines [PSGs], Philippine Professional Standards for Teachers [PPST], and TPACK) defined the TPACK model for Philippine STEAM education. Exploratory investigation and design and development study dictated the path towards realization of the TPACK model.
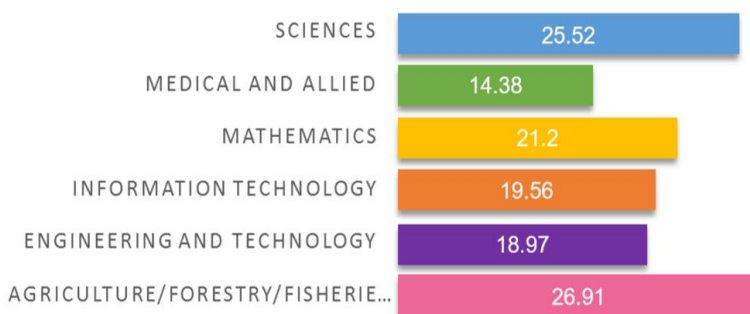
HIGHLIGHTS

STEAM as an educational approach to enact STEAM curriculum is not fully explored in the Philippines.

Disciplines are stronger together than they are apart (e.g., STEAM)', is a new concept in the Philippine Advanced and Higher Learning.

In the country-context, the education agencies utilize global frameworks that may suit the vision to improve the system of education (tertiary), however, there are a minority of data on the pedagogical characterization of Filipino STEAM teachers that may dictate appropriateness of adopted frameworks.

Figure 1. Completion rate (%) across STEAM areas calculated from a 5-year data until SY 2016-2017. Source of Data: Commission on Higher Education

"Low rate of completion in STEAM outlines a negative outlook on how the country may utilize STEAM professionals for knowledge capital of the country."

KEY MESSAGES

✔ Our STEAM Educators characterized unique attributes and traits of pedagogy, assessment and technology integration.

✔ Philippine STEAM educators can be qualified as good level of maturity in pedagogy, and assessment and feedbacking, but a novice level in technology integration practices specifically indexed by their very low engagement in the active and appropriate use of technology in enacting STEAM disciplines.

✔ Low engagement in technology integration is primarily caused by lack of availability of materials and tools, proper training and geographical locations and traditions.

✔ In the TPACK lens, STEAM teachers singly develop one knowledge construct initiated in the mastery of content (as they are trained in disciplinal context), prior to accommodating pedagogical and technological knowledge systems.

✔ Filipino STEAM teachers target and still implement (in a wide context) traditional technology systems (e.g., chalkboard)

✔ Modelled Philippine STEAM Education through the lens of the TPACK framework spell out four major variables that characterize the system of STEAM education in the country: outcomes (envisioned STEAM professionals), drivers (main considerations of STEAM education), institutional support (capability and resources), and processes (mechanisms, progression and STEAM education practices)

POLICY RECOMMENDATIONS

1. Create Philippine STEAM Education niche for all STEAM-related programs which may include formation of a Technical Working Group/Committee to review and initiate curricular revisions of all STEAM programs anchored on the Philippine STEAM Education model.

2. Expansion of STEAM teachers benefits (e.g., 20% discount on the purchase of school, and STEAM-related devices) to address technological affordances.

3. Spearhead enactment of circulars and memoranda for country-wide capacity building of Philippine STEAM Educators.

4. Design micro-credentialing system or highly structured capacity building programs for Philippine STEAM Education to upskill and re-skill STEAM teachers and learners to transition to Education 4.0.

Figure 2. TPACK-influenced mapped Indicators and Dimension of the Philpine STEAM Education Model (Validated)

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