



Scaffolding STEAM Education in Pakistan: Policy Brief

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Introduction & Background

As Pakistan gears up to embrace STEAM education for world stage competitive readiness, it is vital to delineate a comprehensive policy framework to steer the STEAM in Pakistan. This brief, therefore, is a timely contribution in providing an orientation and charting a direction to invite further inputs and support to the country's aspiration to become STEAM literate. It offers evidence-informed insights and recommendations for scaffolding STEAM education in Pakistan. These insights are sourced through an educational transfer process that took place through the engagement of Sukkur IBA faculty members in a ten-month professional knowledge exchange and learning program, STEMPowered Learning with Peabody College of Education, VU, USA.

Key features of the program included online sessions, followed by an immersion visit to the VU, carrying out Problem of Practice (PoP) improvement cycles, and a multi stakeholders' panel discussion which formed a part of culminating convening at Karachi, Pakistan where senior leadership of the Peabody College of Education, faculty members of Sukkur IBA, faculty members from Aga Khan University Institute of Educational Development, Durbeen Institute of Education, school teachers, representatives of civil administration participated. The experiences, observations, evidence, and reflections were derived from participant observations, panel discussion curation and moderation, and participant discussants. The approach recognizes that the process of knowledge transfer involves dynamics of interpretations, adaptations, advocacy, contextualization, monitoring and evaluations, and improvements for scalable and sustainable implementation, and gradual build-up of inclusive policy with a nurturing ecosystem of STEAM education for all in Pakistan.

FLOW OF STEAM POLICY RECOMMENDATION FRAME



STEAM Policy Pillars and Direction

1. It was deemed necessary to consider presage foreshadowing conditions before an intervention of STEAM in Pakistan. Presage factors included silos of school subjects, substandard laboratory and infrastructure, an absence of interdisciplinary culture, and an inadequate assessment system, to mention a few.
- 2 STEAM Ecosystem needs to be built for meaningful and sustainable implementation of STEAM education. Key elements of the ecosystem include inclusive STEAM policy, integrated curriculum, teachers' capacities, resources, infrastructure, networks of community of practice, reimagined assessment, and so forth.
3. In the absence of capacity and resource readiness, it was sensed that a top-down system-building approach (from macro to micro, top-down policy approach) may not work, and therefore organic policy-making (bottom-up) approach could better cater to contractual needs and variability.
4. Principles and standards defining STEAM (benchmarking) are the initial tasks to be undertaken to guide practice and implementation.
5. STEAM requires a change in mindset and re-culturing learning environments. In this respect, a shift in curriculum from monodisciplinary to interdisciplinary, integrated themes responding to real-world issues/problems is warranted to generate STEAM learning, along with a shift in assessment approaches that assess (not measure) holistic learning. The current curriculum logic and architecture need to be altered to make integrated learning possible.



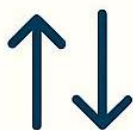
Consider presage foreshadowing conditions

Silos of school subjects, inadequate laboratory and infrastructure, an absence of interdisciplinary culture, and an inadequate assessment



Build a STEAM ecosystem

Inclusive STEAM policy, integrated curriculum, teachers' capacities, resources, infrastructure, networks of communities of practice, reimagined assessment



Adopt a bottom-up approach

Organic policy-making (bottom-up) approach to better cater to contextual needs and variability



Benchmarking of STEAM

Principles and standards defining STEAM are the initial tasks to be undertaken to guide practice and implementation



Cultivate change in mindset

Shift in curriculum from monodisciplinary to interdisciplinary, integrated themes responding to real-world issues/problems

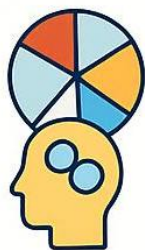
Major Recommendations

- 1: Articulation and benchmarking of STEAM education is needed, keeping contextual variability in mind for equity, access, and quality. STEM needs to be exemplified through certain principles, lens or paradigm, achievement standards, characteristics, and associated elements to build a STEAM ecosystem.
- 2: Need for transition from monocultural school subjects to integrated themes where disciplinary fusion can enhance students' learning. In this regard, our PoP work found that starting from real-world issues to seek knowledge response from diverse disciplines to address the issue can serve as a fulcrum to weave themes, sub-themes, and pedagogies.
- 3: STEAM Teacher education needs to develop an integrated and interdisciplinary mindset, human-centered learning, real-world connected issues centric critical thinking and actions (art of praxis), and inclusive pedagogues mindful of learners' variability: social, cognitive, affective, and neuro diversity.
- 4: Reorganizing learning for integration and application through interdisciplinary curriculum and pedagogies needs rethinking of assessment that is more formative, process assessment, and holistic incremental (beyond scoring towards developmental and reflective of a growth mindset).
- 5: STEAM can happen everywhere around us, such as, in classrooms and labs, wild nature and garden, art galleries and museums, where integration, connections, and collaboration happen, which facilitate scientific and civic reflections, inquiries, and actions.



Articulation and benchmarking of STEAM education

STEM needs to be exemplified through clearly defined principles, paradigmatic lenses, achievement standards, characteristics, and associated elements to build a robust STEAM ecosystem



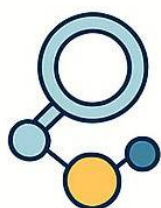
Transition from monocultural school subjects to integrated themes

A fulcrum to weave themes, sub-themes, and pedagogies by seeking knowledge responses from diverse disciplines to address real-world issues



STEAM teacher education

An inclusive pedagogy that is mindful of learners' variability — social, cognitive, affective, and neurodiversity



Reorganising learning for integration and application

Rethinking assessment to make it more formative, process-oriented, and holistically incremental; moving beyond scoring towards developmental and reflective growth mindsets



Infrastructure: Network of people, learning sites, and resources

Further engagement/more information

For more information and consultation, write to: a.datoo@iba-suk.edu.pk, m.muftaba@iba-suk.edu.pk, and ali.nawab@iba-suk.edu.pk.

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