Interdisciplinary and Integrated STEM

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Science, Technology, Engineering, and Mathematics (STEM) is an approach and movement in innovative educational practices from the primary level internationally. This would provide a platform for an inquiry approach, creativity, and innovation in young children and formulate a path for changes in existing practices. The STEM approach is widely accepted as a key educational practice; however, it is dealt with as a combination of disciplines in actual teaching and learning practice. Coherence in this interdisciplinarity and integration has yet to be evolved as a practice in synthesising and designing instruction and could be harbinger for an effective design for future practice. Integrated and interdisciplinary STEM can only generate powerful knowledge to deal with issues that are affecting the planet and bring abiotic and biotic equilibrium. Interdisciplinary and integrated powerful knowledge (IIPK) can act as a roadmap for innovation that can bring changes in existing practices, produce informed citizens, build capacity for informed decisions, and generate sustainable living practices. Interdisciplinary and integrated STEM could lay foundations for IIPK and generate a mindset, approach, and practice. IIPK could lead to the formation of new paths for energy generation, transport, agricultural practices, medical treatment, and clean environment. Interdisciplinary and integrated STEM is not seen in actual practice anywhere nowadays. For coherence in curriculum, implications in instructions need reform and development by the governments across the world. That could lead to a new policy for interdisciplinary and integrated STEM.

interdisciplinary integrated powerful knowledge STEM

A 21st century education and research needs to prepare young people for contemporary life practices and future workplaces with a new vision of this planet to generate an interdisciplinary and integrated powerful knowledge. The interdisciplinary and integrated powerful knowledgebase could deal with the events and trends that society faces during challenging times, such as climate change and the COVID-19 pandemic. While extensive technological, scientific, and medical research has changed the world in the last decade, there are also several difficulties that need to be faced, understood, and responded to, such as climate change and pandemics, such as COVID-19. STEM education and research has a role in producing a future generation capable of making changes in existing lifestyles and practices to deal with challenging and complex situations [1]. To achieve this, it is vital to develop interdisciplinary and integrated STEM teaching and learning practices and research capacity building for innovations that could change life practices [2]. By focusing on interdisciplinary and integrated initiatives, future citizens could be able to develop STEM practices that help to build the skills and knowledgebase to meet the challenges facing society. STEM education and research could be a key in informing future citizens of some of the current problems that exist on our planet and seeking ways to reduce these problems. Exploitation of biotic and abiotic systems to build comfort and convenience for human beings has created disequilibrium and chaos in the natural balance and equilibrium of the planet. Innovative STEM technological practices could deal with these challenges by formulating new life practices and supporting the better utilization of biotic and abiotic systems.

During challenging times such as that of COVID-19, there is a need to formulate new paths and ways of “life practice” in terms of food, energy and water use, buildings, transportation, and health practices. Existing life practices that emerged from the post-industrial revolution have limitations and have led to the overuse of resources, such as the atmosphere, forests, water systems, and soils. STEM education and research are significant as the impacts of contributions from the industrial revolution and the advancement of material comforts has created more issues regarding the natural balance and equilibrium of this planet in terms of biotic and abiotic coexistence. Post-COVID-19, societies are going to face challenges in conserving and effectively using the biotic and abiotic resources of this planet cooperatively and diligently across all the nations of the world. Interdisciplinary and innovative STEM technological practices could deal with these challenges by formulating new life practices and supporting the acceptance of the reality that this planet is not only for human beings but for all forms of biotic and abiotic systems. Abiotic platforms such as atmosphere, oceans, rocks, forest, soil, and rivers provide the basic existence for biotic systems, and future life practices should not disturb the dynamism and equilibrium of these systems. New life practices will emerge with the interdisciplinary and innovative STEM approach and have connections to international economics, politics, and coexistence for peaceful life on this planet [3]. A new vision of the world capable of dealing with post-COVID-19 life practices will almost certainly emerge and draw from interdisciplinary, integrated, and innovative STEM education and research.

The focus on student learning during the 21st century education needs to be capable of producing future citizens with skills in Science, Technology, Engineering, and Mathematics (STEM) and who can deal with challenging complex life practices, which is best to be developed throughout the education, starting from primary schools [4]. The concept of an ecosystem of social networks of peers, educators, friends, and families to support in school and out of school contexts of learning offers promise in developing this for schoolteachers and students and finding appropriate societal contexts for connecting to educational practices [5]. An early focus with appropriate experiences connecting to real-world settings and the concept of ecosystem can influence and foster innovation in STEM. Interdisciplinary, integrated, and connected to the real-world approaches of the school experience are a way to focus on STEM education and provide insight into innovation for new life practices for everyone. Schools and future teachers need to prepare young people for contemporary life practices and future workplaces with a new vision of this planet. A thorough overhaul of STEM education and teacher preparation is necessary in primary, secondary, and post-compulsory education. STEM education and research is not only the slogan, but it should also have a clear purpose to connect curricula, capable of generations in workplaces producing innovations that could develop new paths for the world [2]. Future STEM education programmes and research need this focus to be able to have the capacity to develop innovative new pathways towards lifestyle changes that lead to sustainability.

References

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