https://doi.org/10.53964/jmer.2022003

https://www.innovationforever.com

Journal of
Modern Educational Research

ISSN 2790-3192 (Online)

Open Access

Short Commentary

STEM Education in Chinese Herbal Medicine

Siukan Law[1*], Dawn Chingtung Au[1], Albert Wingnang Leung[2], Chuanshan Xu[3]

[1]Faculty of Science and Technology, The Technological and Higher Education Institute of Hong Kong, Hong Kong, China

[2]School of Nursing, Tung Wah College, Hong Kong, China

[3]Key Laboratory of Molecular Target and Clinical Pharmacology, State Key Laboratory of Respiratory Disease, School of Pharmaceutical Sciences & Fifth Affiliated Hospital, Guangzhou Medical University, Guangdong Province, China

[*]**Correspondence to: Siukan Law, PhD, Technician/Researcher,** Faculty of Science and Technology, The Technological and Higher Education Institute of Hong Kong, 20A Tsing Yi Road, Tsing Yi Island, New Territories 999077, Hong Kong, China; E-mail: siukanlaw@hotmail.com

Received: March 29, 2022 **Revised:** April 8, 2022 **Accepted:** April 11, 2022 **Published:** July 11, 2022

Abstract

"STEM Education" is an innovative teaching approach and positioned to develop diverse student potentials to meet future challenges, especially to enhance students' learning ability, and improve their critical thinking skills. "Chinese Herbal Medicine" is a Chinese medicine subject. This is so boring if the student learns with a traditional teaching approach, and it's hard to remember all of the things. How do we incorporate this boring subject into STEM education to draw their attention? As the STEM Education just start at the beginning, much more works need to be done, such as modifying and updating some curriculums in Chinese medicine after the collection of data from students.

Keywords: STEM Education, Chinese Herbal Medicine

Citation: Law S, Au DC, Leung AW, Xu C. STEM Education in Chinese Herbal Medicine. *J Mod Educ Res*, 2022; 1: 3. DOI: 10.53964/jmer.2022003.

STEM is a teaching approach that integrates the four disciplines, such as science, technology, engineering, and mathematics from single subject development to a cross-disciplinary program. This is also known as STEAM with the addition of art elements. STEM education is expected to enhance students' learning ability, and improve their critical thinking skills which become more creative, logical, and innovative related to real situations[1].

According to the *Compendium of Materia Medica*, there are more than 12,000 medicinal xplants in China[2]. Traditional Chinese medicine is composed of botanical medicine, animal medicine, and mineral medicine. Botanical medicine accounts for the majority and is called "Chinese Herbal Medicine". Classification is the most important to identify the quality of Chinese medicine including character distinction, microscopic authentication, physicochemical identification, and DNA technology analysis. How do we incorporate these approaches into STEM education?

Character distinction is the easiest one to incorporate into

STEM education because of its eye view, nose smell, hand model, and mouth taste methods which are quite suitable for children's learning. Shall we make these an interesting topic to draw their attention? Children's interests originated from curiosity. If eye, nose, hand, and mouth are the basic learning tools, this must be more attractive for children and different from traditional teaching, which focuses on the lecture notes or materials, and as a result, lacks interpersonal interaction.

Children observe the external characteristics of Chinese herbal medicines including size, shape, color, surface, texture, broken section, and a cross-section through their eyes. Different Chinese medicines have a specific smell that is classified by the nose. They also distinguish the texture of Chinese medicine with the usage of a hand touching to judge the weight, smoothness, looseness, tightness, powdery, etc. Meanwhile, Chinese medicine tastes are unique via mouth testing such as pungent, sweet, sour, bitter, and salty[3]. These teaching approaches enhance the children's self-learning and enthusiasm.

Besides, we take a photo with each part of the medicinal plant and summarize in a book or post it on the website. It becomes more interesting for children to learn than observing real medicinal plants only. Microscopic authentication is the advanced course at the tertiary level for Chinese medicine classification. This is difficult for children to understand, which can invite some microscopic authentication experts to record a video with simplified descriptions for them. Let's make the subject more attractive and enhance children's long-term memory. Teachers' and Children's understanding are different in Chinese herbal medicine. It is better to have some sharing sessions, exhibitions, special lectures, and workshops regularly for mutual learning, particularly in physicochemical identification, and DNA technology analysis[4].

This can be concluded that it is just the beginning of STEM education in traditional Chinese medicine. Some curriculums require modification and update to promote children learning. The purposes of STEM education are to develop the learnability and critical thinking to learn a subject more logically.

Acknowledgments

Not applicable.

Conflicts of Interest

The authors declared no conflict of interest.

Author Contribution

All authors contributed to the concept, acquisition and analysis of data, drafting of the article, and critical revision for important intellectual content.

References

[1] Kubat U. The integration of STEM into science classes. *World J Educ Techno: Curr Issues*, 2018; 10: 165-173.

[2] Wang J, Mei QX. Literature research of Compendium of Materia Medica quoted froxm Bencao Tujing. *Chin J Med Hist*, 2021; 51: 34-42. DOI: 10.3760/cma.j.cn112155-20201222-00200

[3] Pan SY, Litscher G, Gao SH et al. Historical perspective of traditional indigenous medical practices: the current renaissance and conservation of herbal resources. *Evid-Based Compl Alt*, 2014; 2014: 525340. DOI: 10.1155/2014/525340

[4] Hu FT, Zhang YY, Fang L. Thinking and practicing on cultivating TCM freshmen's thinking of traditional chinese medicine specialty. *Educ Forum*, 2015; 18: 119-120.