

Community Engagement and STEAM Outreach

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Abstract:

By keeping involved the students in everyday issues and events, STEAM education can facilitate in developing the citizens who are equipped to make the world a better place. However, students' STEAM learning with this notion requires teachers to identify age and context for appropriate issues. Students' investigation of local issues and events can be motivation for students. Their learning can get advantage from involvement with community members who wish to give their knowledge and ideas. In reciprocity, students can also contribute their ideas and actions to the community, especially when there is a two-way exchange of information from the community to students and students to the community.

Keywords: STEAM, Engaging Community, Motivation

Introduction

Community engagement refers to a strategic process to involve local populations directly in all aspects of decision-making, policy development and its implementation for strengthening local ownership, capacities and community structures. The secondary, but a vital purpose of community engagement is to improve transparency, enhance accountability and make optimal allocations of resources across diverse settings. Moreover, an additional benefit of an engaged community is that it may build relationships within the community which lead to stronger and more resilient communities. Science, technology, engineering, arts and mathematics in fusion with varied priority at different times are inherently involved in understanding and addressing many of the

challenges and opportunities we face as individuals and societies. STEAM education as an interdisciplinary approach allows students to become involved in understanding and finding solutions to problems set in real world context. Therefore, the rationale for STEAM education extends beyond economic benefits to the development of citizens who are equipped to make the world a better place by enhancing our environment and way of life and to raise the issues of social justice. Researchers align themselves with Bybee (2010) when he points out that the personal, community or global issues addressed, whether a primarily environmental, economic or social one, should be appropriate with age and context. We do agree also that as students explore and come to understand an issue, they now need to get support in reaching out to the various STEAM disciplines so that they may use those knowledge and skills for resolving such issues which bothers them. With the perspective of goal to set STEAM teaching, teaching and learning in realistic situations, students' STEAM learning can also get benefit from their engagement with the community. In an ideal situation, there exists a two-way for transferring the information i.e. from the community to students, and students to the community (Mildenhall, 2021). By doing in this way, students may get a large opportunities to develop their STEAM knowledge, understanding, capacities for communication, collaboration, critical thinking and creativity.

1.1 The Importance of Community Involvement

If we look into the past then it finds that community engagement in education is not new; it can be a relevant connection with Dewey (1946) who strongly advocated it as a central component in education which plays essentially a key role in bringing changes in the society and nation. Now-a-days, there has been a move to consider education as an ecosystem composed of prominent stakeholders and contributors such as businessmen, entrepreneurs etc. Such ecosystems make benefits not only to the student of certain age groups but it covers learners of all age groups. Apart from students, several groups of adult people and multigenerational groups such as families also, Rheingold (2011) argues that when students - individually and collectively - enable to make a contribution to the "vitality of the community" (Meettinen, 2005) through public performances and presentations, their sense of self and of their community is transferred and thus a relationship develops among students, teachers and the community."

1.2 Conceptual Background of STEAM

The concept of STEAM has been a great interest for researchers in the field of education throughout the world. Various related literatures consider STEAM is an advanced model of the STEM approach. STEAM is an educational approach incorporating "art" into existing STEM, comprising science, technology, engineering, arts and mathematics (Herro & Quigley, 2016; Mifsud et al., 2020).

Perignat& Katz-Buonincontro (2019) concludes on their research findings that by incorporating STEAM education, it becomes easier to remember, increase cognitive abilities and train time management. Furthermore, it also helps in enhancing the creative thinking across interdisciplinary subjects.

According to Tan & Lee (2022), the concept of STEAM trains students to:

- (i) improve technological abilities
- (ii) use problem-based learning
- (iii) conduct researches to find the solution of a problem
- (iv) Collaborative problem solving process.

The STEAM education guide consists of two main components as (i) a means to generate interest among students for solving real-life problems by designing STEAM problem-solving concepts, and (ii) a support for the improvement of technological capabilities, namely extracurricular activities such as video production, digital drawings/sketch, visual tools and collaboration.

2.1 Some Important Reviews of Related Literatures

Bertrand & Namukasa (2020) conducted a study on “STEAM education: student learning and transferable skills”. The main purpose of this study is to better understand the STEAM instructional programmes and student learning offered by non-profit organizations and by publicly funded schools in Ontario, Canada. The main findings on student learning focused on students developing perseverance, adaptability and learning transferable skills.

Hsiao & Su (2021) intended to conduct a study on the impact of STEAM education for sustainable development courses and its effects on student motivation and learning. The results of this study showed that the combination of STEAM education with VR-aided experience courses, could help to improve the learning satisfaction and outcomes of students and to arouse their learning motivation.

Firmansyah & Aslan (2025) conducted a study to assess the relevance of STEAM education in preparing students to face the needs and challenges of the 21st century. Researchers used the literature research method to conduct this research. On the basis of this research findings, researchers concluded that STEAM education is very relevant in preparing students for the challenges of the 21st century involving technological advances and globalization.

Singh (2022) aimed to study the “acquisition of 21st century skills through STEAM education”. Researcher finds in his study that by incorporating art into STEM, students can use both their analytical and creative minds to solve complex problems. STEAM education incorporates 4C’s of 21st century skills: Creativity, Critical thinking, Collaboration and Communication.

3.1 Research Method Methodology

For the purpose of this research, the researchers had used the literature research method. This method is a systematic approach to identify, evaluate and interpret the written works relevant to a particular research topic. The researchers used some sources such as journal articles and previously published publications. The researcher did an in-depth understanding of the topic under study through an analysis of the information found in the literatures.

4.1 Contribution of Students to the Community

A practical contribution of students through STEAM education can be made to their community. The contributions made by students depend on the issues related to the community. Rennie (2006) provides an example of the impact of a year for class IX project to understand and raise community awareness about the reasons for poor air quality. The class erected air monitoring equipment and established a website that ensured up-to-date meteorological information was available to the community after analyzing some research findings related to STEAM, the researchers marked that it develops critical thinking among the students by allowing them to think critically on various issues of the community. Students' involvement in the critical thinking and the problem-solving process has built up a culture of enquiry, in which asking and answering their questions become the counter piece of the learning process.

5.1 Conclusions

STEAM (Science, Technology, Engineering, Arts and Mathematics) education are viewed as interdisciplinary subject that weaves together various aspects of the curriculum in different ways and with different emphases depending on the context and topic of the teaching unit. Researchers had tried to focus that students' motivation and engagement with STEAM learning can be enhanced through prioritizing the local real world events and issues.

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