

Project Report: "Diversity through STEAM: Igniting Creativity, Innovation, and Experimentation" at Dechencholing Higher Secondary School, Thimphu Bhutan.

Introduction

With the financial support of the Biochemical Society, Dechencholing Higher Secondary School has started an initiative called "Diversity through STEAM: Igniting Creativity, Innovation, and Experimentation." By incorporating Science, Technology, Engineering, Arts, and Mathematics (STEAM), this project seeks to improve the educational experience. The goal is to give students opportunity for hands-on, experimental learning while also promoting creativity and inventive thinking especially focusing on girl students.

Objectives

By encouraging involvement from female students from a variety of backgrounds and guaranteeing equitable access to STEAM education, it first aims to advance diversity and inclusion. Its second goal is to promote innovation and creativity by fusing artistic and scientific methods of problem-solving. Third, the curriculum emphasizes improving experiential learning by integrating theoretical information with real-world, hands-on activities. Fourthly, it seeks to develop in students important abilities such as technical proficiency, teamwork, and critical thinking. Last but not least, by exposing children to potential job possibilities in STEAM subjects, the curriculum promotes career exploration.

Program Implementation

The program has put in place a number of crucial elements in order to meet these goals. The Art-scientific Collaborations program is a noteworthy endeavour that involves art and scientific students working together on collaborative projects. Students, for instance, produced works of visual art that drew inspiration from scientific ideas like the structure of DNA or photosynthesis. In addition to encouraging creativity, this fusion of art and science made scientific concepts easier for pupils to comprehend.

The program's organization of competitions and exhibitions was another crucial element. Students were given the opportunity to present their work at these events, and their submissions were judged on their originality, inventiveness, and scientific rigor. Peer and expert input was very helpful in helping them refine their ideas and improve their learning process. Furthermore, classes on Creative Coding were held, providing students with a variety of coding abilities ranging from basic to advanced. The pupils' development of technical proficiency was greatly aided by these workshops.

Another important component of the program was how exhibitions and competitions were organized. At these events, students had the chance to exhibit their work, which was evaluated based on its originality, ingenuity, and scientific rigour. Their learning process was enhanced and their ideas were refined with the valuable input of experts and peers. Additionally, classes on creative coding were offered, giving students access to a range of coding skills, from basic to sophisticated. These sessions played a major role in helping the students enhance their technical ability.

Impact and Outcomes

The program had a significant effect on involvement and engagement among students. Participation significantly increased, especially from underrepresented groups. The program's success in fostering diversity and inclusion is demonstrated by the noticeably higher participation rates in STEAM activities among female students and those from economically disadvantaged families.

Students showed a noticeable improvement in their technical, problem-solving, and critical thinking abilities. Students were able to apply their knowledge in real-world scenarios and gain a deeper understanding of complicated subjects thanks in large part to the practical experiments and multidisciplinary projects. The emphasis on experiential learning made sure that students could see how their studies were applied in the actual world, which increased the process of learning and made it more interesting.

The program produced a number of unique projects that demonstrated the students' creative abilities. Notable examples include the creation of biodegradable plastic from organic waste found in the area, an app that helps farmers adjust irrigation based on soil moisture levels, and recycled materials art installations that illustrated scientific

phenomena. These projects demonstrated the kids' inventiveness as well as their dedication to using STEAM to solve real-world issues.

Challenges and Recommendations

Even with its achievements, the program had a number of difficulties. The lack of resources was a serious problem because the supplies and tools available for the project were limited. Even though the Biochemical Society's assistance was priceless, more money is required to completely outfit the labs and give them the tools they require. The requirement for teachers to engage in ongoing professional development presented another difficulty. For the program to succeed, it is essential to keep educators informed about the most recent developments in STEAM education. Furthermore, maintaining students' interest in STEAM disciplines over the long term necessitates consistent work and creative ways to maintain the curriculum interesting and current.

A number of suggestions have been made to remedy these issues. To improve resources and facilities, more money from public and private sources is required. Regular training programs will guarantee that educators are prepared to provide successful STEAM instruction. Increasing the scope of outreach initiatives to involve the larger community can aid in highlighting the significance of STEAM education and obtaining more funding. Forming long-term alliances with institutions such as the Biochemical Society can help the program receive ongoing funding and support.

Conclusion

Students' educational experiences have been greatly enhanced by Dechencholing Higher Secondary School's "Diversity through STEAM: Igniting Creativity, Innovation, and Experimentation" initiative. Through the promotion of diversity and inclusivity, the cultivation of creativity, and the provision of experiential learning opportunities, the program has effectively sparked students' interest in STEAM. The program's effectiveness is demonstrated by the rise in student participation and engagement, especially among marginalized groups.

Sustaining and growing these projects requires ongoing development and funding. It will take continued funding, teacher professional development, and creative curriculum design strategies to make sure all children have the chance to succeed in STEAM professions. Dechencholing Higher Secondary School can maintain its position as a leader in STEAM education, preparing students for future vocations and making a positive impact on a more inclusive and diverse scientific community, by building on the program's strengths and tackling its obstacles.

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