Presenter's Biography

Sunoj is an educator by passion, an engineer by degree and a maker at heart. Born on Jan 22nd 1989 at Chhatre Deurali, Dhading. As an engineer turned educator, he has taken a unique approach of integrating making with STEAM (Science, Technology, Engineering, Arts & Design, and Mathematics) and 21st century skills (Creativity, Communication, Collaboration and Critical Thinking).

He is the Head Teachers and one of the co-founder of Karkhana (from 2013 till now).He has presented his work at 9th International Conference on Communities & Technology conference on 3-7 June 2019, organized by TU Wien, in Vinna, Austria. He recently presented a paper at the Second International Conference in Quality Education, (ICQE) organized by Rato Bangala Foundation from 24-26 August 2019 on the theme of "Ensuring Learner Centered Education"

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Reflection on a year of STEAM education

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Abstract

The approach to hands-on-learning or learning by doing or STEAM education is regarded as a vital path in creating a long-lasting and meaningful learning experience in the students. This study investigates the perspectives of hands-on- STEAM learning experience of the students in BeeCreative classes and also tries to see the visible impact it has made in their study. BeeCreative is an initiative of an education company and maker space – Karkhana, which aims to provide a practical hands-on STEAM learning experience to middle school students.

A survey was conducted in the partner schools where the students had filled up the questionnaires based on their experience of at least a year of STEAM classes. The questionnaire was designed to understand the perspective of students towards the class, the teacher's behavior and the workbook. Almost 60% of the students liked working in the teams followed by 39% liking conducting experiments and challenges, and 31% liking sharing of ideas. STEAM classes are found to be helpful to students in learning science better with hands-on activities while challenging students to think critically and creatively. Integrating the Science, Technology, Engineering, Arts and Mathematics through an activity to create an environment for students to construct their own meaning was helpful was students to draw real-life connection.

Introduction

UN's Sustainable Development Goal 4 (SDG4) aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Since quality education is the basis to attain interconnected 16 other goals, achieving its target is very crucial to achieve the SDGs, especially in a country like Nepal.

To address the challenge of creating a meaningful learning experience for students in a school setting, Karkhana researched different education frameworks and came up with their own framework. The framework adopted the scientific thinking skills and processes of the middle year program science framework (MYP) and followed the national curriculum of Nepal. Karkhana designed STEAM lesson plans that are both hands-on and minds-on with kits that a teacher can use to run the activity in the class.

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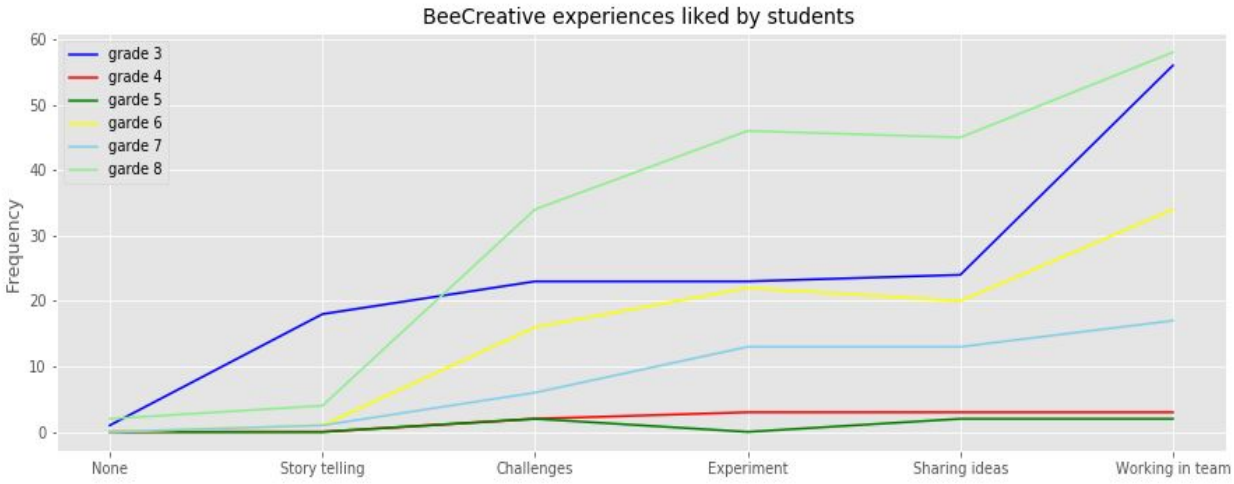
Data Collection and Analysis

The handwritten responses by the students were collected and documented as individual responses on the google form for the easiness. The responses were extracted as google sheet. Search formula was used to find if that entity is selected by the students or not in the form of yes or no using google sheet. Count of yes was then taken out using CountIf formula. Sub table was created for each grade 3-8 for likemost, boring, workbook, subject, content. Then frequencies of each entity inside the sub tables were calculated.

Findings



Conclusions and Recommendations

Based on the students' reflection of the BeeCreative year 2075 we can draw following conclusions.

- Hands-on STEAM learning method should be integrated to keep students engaged in the subject matter
- Teachers need to challenge students thinking being in the zone of proximal development.
- Students develop 21st-century skills like communication, collaboration, creativity and critical thinking while doing activities with peers that stimulates their thinking.
- The contents for junior grades can be made more focused on storytelling whereas, experiments and challenges needs to be focused on senior grades.
- Interactive workbooks would engage students curiosity.

References and Notes

Ateş, Özlem & Eryilmaz, Ali. (2011). Effectiveness of hands-on and minds-on activities on students' achievement and attitudes towards physics. Asia-Pacific Forum on Science Learning and Teaching. 12.