

Observations of Learning as a Social Activity

When learning becomes a social activity it spreads effortlessly spreading from one initiator to many.

- **Rubik's Cube, Games and puzzles:** Over 20 children we work with can now solve the Rubik's Cube without looking at the instruction manual. Playing and learning strategies in the games and puzzles in STEM land have similarly spread without one-on-one inputs from facilitators.
- **Sets Game:** One of the volunteers had an interesting game that helped children learn some of the fundamental ideas about sets. Children made their own sets game and were able to link it to concepts of intersection, complement within set theory.



Figure 9: Children playing sets game

Deep learning: Ability to Apply Concepts Learned

- Two 7th graders fixed a STEM land blinking board and one of them was interested in doing something more with the Arduino.
- He wired up the 7 segments to a separate Arduino pins to control the segments individually and managed to write his first program in 'C' to display a 1 by the end of a class.
- He further managed to figure out the logic of the first digit continuing to run when the second digit was implemented to create a 99s counter.

STEM to STEAM

- The children made many projects to demonstrate their learning and some of these were remarkably detailed and artistic.
- One of the children created a project in co-ordinate geometry that allowed the user to enter points one-by-one and when the picture was complete it became a van. This project brought creativity and art.

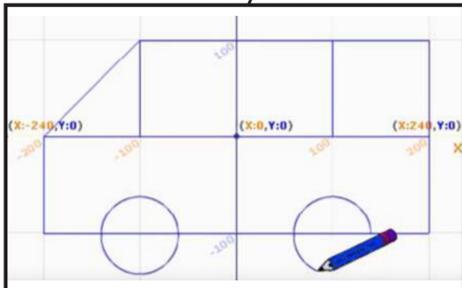


Figure 10: Co-ordinate geometry as art

Outcomes of 9th Grade

- A survey with 9th graders showed that 90% of the children were proud of creating projects, being able to solve puzzles, being able to work independently and in groups, ability to plan their work and track their progress.
- We also found that the academic performance on an average had increased by 7 points from before.

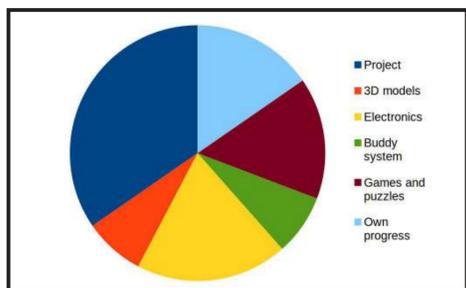


Figure 11: What 9th graders were proud of

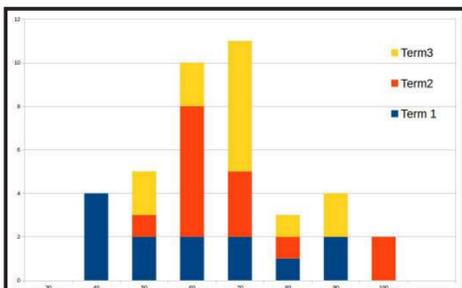


Figure 12: 9th score over terms

Working with younger children

Our approach with younger 3rd -7th graders at Isai Ambalam school had been quite different and were still looking at inculcating values of responsibility, equality and courage to

create. We looked at real-life challenges facing us e.g. the school faced a water issue and the children started exploring solutions and understanding water. Resulting in

- building an instrument to measure the water level of the bore-well and tracked it.
- creating an overflow alarm system for the overhead tank
- building a pond during their breaks and sleep over learning to use various tools and also estimating and mixing cement, etc.



Figure 13: Pond at Isai Ambalam School

Conclusions

Children can be responsible for their own learning if emphasis is provided in giving them access to tools that help them make choices from possibility rather than fears or socializations. This creates a rich collaborative learning community which showed not only individual progress, but also rich peer-to-peer learning. Learning itself became a social activity.

When facilitators provide an encouraging and supportive environment without directing all the activities surprising discoveries and demonstrable progress can be made. The essence of such a learning environment are its values that can be used with even younger children.

Acknowledgements:

We thank Aura Semiconductor Private Limited, Asha for Education and SAIER for their continuous support to STEM land that made this research possible.

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