STEM focus

In this newsletter there is a strong focus on the ‘T’ part of STEM: Technology. Read how one service is working with unplugged and coding activities. Find some useful resources for learning activities in maths, science, engineering and technologies. Discuss some new ideas at your next staff meeting. Plan for Science Week, 11–19 August 2018.

Case study: STEM

‘It doesn’t matter if it fails as that’s how you learn.’

Janene Sadler is currently a Lead Educator of a full-time class at Mother Teresa Early Learning Centre in Harrison, ACT. She is also the ICT Coordinator. Over seven years she has had the privilege of working with the dedicated educators at the Mother Teresa ELC to develop a STEM program specific to that service. The service is developing a sustained focus on digital technologies. Here, she describes the journey that they have been on.

How does your service approach the area of STEM in terms of your education program?

We are very open to the STEM approach and relish the opportunities to see what is new and exciting in this area through professional learning and discussions. We have a play-based curriculum, which allows children to investigate, explore and question the world around them. This is the perfect environment within which to engage with STEM. We are fully connected with our primary school and this is reflected in our program, as we engage with many aspects of school life, alongside developing our nature-based risk-taking philosophy in the form of nature walks, working with and cooking on fire and developing our risk-assessment skills, climbing trees and using tools. Therefore, we have to be very innovative and creative with how we incorporate STEM each day.

What types of activities have been effective in working with children?

I have developed a framework for technology that is specifically designed for our centre and which caters for both full-time and the part-time classes. It is broken down into terms, and educators can pick and choose what suits their individual programs. This allows them to explore at their own pace and extend on their own interests. Our centre uses coding, in many forms, starting with unplugged, then introducing apps, writing code and then using beebots. Breaking the process into steps and using it creatively engages children and creates a hype that keeps them coming back and wanting more.
Your service uses ‘flipped learning’ as a teaching strategy; can you describe how this works?

Flipped learning is a new strategy that our centre is exploring following professional learning. This is something that we had to modify to suit our style of teaching. We make open-ended instructional videos for the children to use. They are able to access the iPad, watch the video and then carry out the activity, replaying the video if needed. These activities can be done without educators, freeing up educators to observe and watch the children.

Have you encountered any challenges in working with STEM as a focus?

Helping other educators is important to keeping STEM alive, and we have weekly staff meetings where we can ask questions or share ideas. I have one day off a term to support the use of technology within the centre. We keep parents up to date through Google plus and at the start of the year during our information evening we were able to inform parents regarding our STEM program.

There are always problems when working with technology. The main one is that it sometimes just doesn't work, but having a backup plan is helpful. Money is another issue: setting up kits can be a costly process and a time-consuming one as well. We are in the process of looking into starting a lending library with other centres in our organisation. This will help bring costs down and provide access to a larger array of technologies.

This project is still in its infancy but will hopefully come to fruition later this year. This will allow more children access to different technologies. I have come across a few challenges, particularly finding professional learning aimed for the younger years; I currently attend sessions aimed at primary schools and then modify what I have learnt to make it work in our centre. Time is another challenge that we face, especially for the part-time classes. Trying to fit everything into a few days can be hard.

What are some resources that other educators could use, either to improve their own understandings or in working with children?

There are many resources available to support STEM, but we are always looking for creative ways to develop the children's thinking. Our centre starts first with unplugged coding and we introduce the iPad to the children on how to take photos. This enables them to document their own learning. The iPad is attached to the wall, along with their names, the children can then grab their name and iPad and take a photo of their construction, puzzle or whatever they want to put in their learning journal. At the end of the day we can print from the iPad and put the photo straight into their learning journal with a blurb of why they took that photo.
Other forms of technology we use are beebots, makey makey, robotics, solar power kits, OSMO varieties, along with science investigations. These activities help children with their thinking and creative processes. They can be used in whole group, small group or individual experiences.

**What tips/advice would you have for other educators interested in STEM?**

My advice for you all is to not be scared to give it a go, the children love it when things don't work. They even help to fix the problems. Put a plan together, make a list of what interests you, start networking with some people around you and see what professional development is out there.
**Resources**

**STEM in Early Childhood: How to keep it simple and fun** – This PPT by Dr Pauline Roberts of Edith Cowan University provides a definition of STEM activities, a rationale for STEM in the early years and some useful links and ideas.

**Five things parents can do every day to help develop STEM skills from a young age** – In addition to developing early literacy skills, parents and early years educators can also encourage early STEM (science, technology, engineering and mathematics) skills. This article has five strategies that support this focus.

**Ten science experiments for toddlers** – Provide rich experiences that show how the world works just by targeting sight, hearing, smell, touch and taste. Beyond looking at the five senses, consider how you can teach toddlers about simple science such as pull and push / float and sink / hot and cold.

**Northern Territory Preschool Maths Games** – These games are designed to be fun for children and easy to use for teachers. They focus on encouraging active participation, mathematical thinking and reasoning, and back-and-forth conversations.

**Taking Small BYTES card deck** – This resource showcases learning opportunities built around digital technologies and other play-based learning experiences.

**Water jar xylophone** – this science experiment at Kids Resort Early Learning Centre teaches the children how sound changes depending on the volume of water in each jar.