 Infinity and beyond

9 sessions over 9 months

One on one coaching sessions occur with staff every three weeks around the topics of – backward mapping, STEM style activities integrated into everyday teaching e.g. Daily 5, consistent programming proformas (STEM, daily 5), resource sharing, team teaching and assessment as, of and for learning.

Purpose/context

Small school, two teachers and principal driving force behind STEM. We explored coaching sessions as our project to build capacity and develop a streamlined, structured, and coherent progression of skills and ways of thinking in students K-6.

Aims

Short term – buy in

Long term – consistency in implementation and programming, assessment, common understandings, and ways of thinking

Driving questions

1. How does STEM pedagogy allow us to develop in students that would be missed without this approach?
2. How can STEM be embedded in the day to day learning of students and avoid a tokenistic approach?
3. How do you ensure deep discipline knowledge is developed and maintained for teachers and students?
4. What is the progression of skills and knowledge that should occur K-6 and can these be mapped on a developmental continuum?
5. What skills, knowledge and understanding, and ways of learning can and should be assessed and what is the best way to do this and when?
6. What systems of accountability for curriculum mapping, assessment and reporting are in place?

Event/process/activity/program

Session 1

Revisit of STEM pedagogy presentation and discussion. Teachers reviewed the school STEM programming proforma and were coached in recording their teaching and learning activities from the previous week onto the sheet. Discussion on what ways of thinking had been explored and developed by students during the projects. Teachers were also given the opportunity to look through the assessment syllabus recording sheets and tick off outcomes they had taught and achieved so far in this unit. As teachers looked at the syllabus outcomes and familiarised themselves, discussions and ideas were formulated as a group about STEM type activities that could be integrated into the day that fulfilled those syllabus requirements. Discussions were had about backwards mapping and teachers were provided with 3 proformas to have trial programming with before the next session.

Session 2

Teachers were given time to document their weeks teaching and learning experiences onto the STEM programming sheet. Teachers were also given time to plan for next week’s lessons. Teachers were shown where the programming proformas were stored on the T drive and had time to make slight modifications to the original to suit their class. Further discussions and coaching around the syllabus assessment sheets. All teachers demonstrated a common understanding of ‘backwards mapping’ and an understanding as to why they need to know the syllabus content well so they can tailor and modify learning experiences to meet syllabus requirements.

Session 3

Teachers were given time to document their weeks teaching and learning experiences onto the STEM programming sheet. Teachers were also given time to plan for next week’s lessons. Teachers completed the mind mapping process for next terms topic “RIO”. Teachers were given time to search ‘Pinterest’ and accumulate a list of hands on creative activities that could be integrated into “RIO”. Discussions about Daily 5 started as a platform where teachers can integrate their theme and get through all their teaching.

Session 4

Teachers were given time to document their weeks teaching and learning experiences onto the STEM programming sheet. Teachers were also given time to plan for next week’s lessons and discuss where STEM activities could be integrated into everyday lessons. Further discussion and recording of the development of thinking skills. Discussions about assessment were brought up and teachers compiled a continuum of skills and

outcomes of the science and technology syllabus. Deep understanding of discipline skills and explicit teaching required as prerequisites to get the most out of STEM projects discussed.

Session 5

Teachers will be given time to document their weeks of teaching and learning activities. Sharing session and discussions about how teachers are integrating STEM throughout their day. Professional reading about work on writing component in Daily 5. Discussions about quality written tasks that cover all KLAs that can be designed and implemented as a response to a shared experience and a demonstration of knowledge and understanding to be used for assessment. Next continuum constructed with teachers is the Mathematics Syllabus

Sessions 6 – 9 TBA

(Each session is devised following the previous session feedback, observations, and document analysis so as to be responsive to teacher’s needs as well as final project outcomes. What systems of accountability for curriculum mapping, assessment and reporting are in place? This driver has been embedded throughout the process and will be used in the final session to pull the process together to a conclusion and provide a common foundation for 2017.)

Milestones

1. How does STEM pedagogy allow us to develop in students that would be missed without this approach?
2. How can STEM be embedded in the day to day learning of students and avoid a tokenistic approach?

Common understanding about backwards mapping and beginning of change in teacher thinking to be more creative and divergent.

1. How do you ensure deep discipline knowledge is developed and maintained for teachers and students?

Change in thinking and how hands on tasks can be viewed from different lenses.

Developing understanding of how flexible structures and grouping can be used to support the implementation of STEM in the classroom. Also types of learning activities that can be integrated into each session to cover all required content well.

1. What is the progression of skills and knowledge that should occur K-6 and can these be mapped on a developmental continuum?
2. What skills, knowledge and understanding, and ways of learning can and should be assessed and what is the best way to do this and when?

Whilst making continuums, teachers expand their knowledge of syllabus content and the progression of skills required for assessment purposes.

Resources

Casual days for teachers to have half a day off class to participate in coaching sessions with 2 mentor teachers.

All other resources are paper based.

Culminating event, activity, or product

Following observations from University of Newcastle education faculty strong consideration is being given to write a pedagogy paper in conjunction with the University of Newcastle exploring transformative pedagogy and the development of 21st Century habits of mind through the lens of STEM.

In addition to the implementation of a K-6 model of STEM each term has a significant community event.

Site study – Glenrock lagoon, rock pool exploration – T1

Space exploration – Star gazing with the Astronomical Society – T1

Sports science – whole school Olympic event – T3

Family engineering night – T4

Evaluation

Observations and feedback on project implementation

Document analysis, interview, and survey of staff

Gap analysis of vision and practice

Staff reflection utilising Galileo rubric

Focus group and interview of students