Key pillars for a successful & sustainable STEM program in schools

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Brainstorm Activity

- Given the task outline what would need to be considered to implement such a task in your school.

Context:

- Four year 8 classes
- Across the disciplines of maths, science, art and design tech
- Involves 10+ staff

The major hurdles for a STEM program...

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- Logistical considerations - timetables, funding etc
- Curriculum development - time and effort
- Teacher skills and understanding
- Getting buy in from stakeholders
  - ✓ School Leadership
  - ✓ Student engagement
  - ✓ STEM Industry partners
  - ✓ Other teachers
- Assessment
- Other?

The beginnings of STEM at Grovedale

- Began in the SS-STEM program with the support of the leadership team
- The project started with two year 8 classes
- Key focuses initially identified included a multi-disciplinary approach, collaboration and inquiry based
- Only 6 teachers involved
- The evolution of STEM (or STEAM) at Grovedale now incorporates multiple subject areas, multiple year levels and over 20 staff

Key pillars for a successful & sustainable STEM program in schools

Six steps to starting a STEM program….

1.Seek support from School Management

- Support from School Council
- Support of College Principal Class
  - Time allocation
  - Leadership Member Portfolio Responsibility
  - Financial support
- Support from College Leadership Teams
  - Leading Teachers
  - College Timetabler
  - Curriculum Managers
  - Relevant Year Level Coordinators
  - KLA Leaders

For true facilitation, sustainability and success Leadership members must offer support and have buy-in.

2. Seek & Deliver STEM Professional Development

- STEM Leaders &Program Facilitators PD
    - As STEM program leaders and facilitators, seek the necessary Professional Development opportunities &support networks
- Teaching staff PD
    - Providing teachers with the necessary skills and understanding to implement a successful program
    - Providing opportunities for teacher collaboration including the sharing of ideas and plans

3. Establish a STEM Philosophy

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- What should STEM look like at our school?
- What is it that we want to achieve?
  - The end product
    - ✓ Increasing the engagement of students in the key subject areas
    - ✓ Increased uptake of VCE maths and science subjects
    - ✓ Greater awareness of future career pathways in the STEM industry
- How will STEM success at our school be measured?
  - What are our Key Indicators &success criterias?

Sometimes your philosophy may not become clear until after you have your programs thought out.

4. Build STEM Curriculum and Resources

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- Stand alone program or blend with existing curriculum?
- What curriculum areas will the program be set in?
- How to make it engaging &relevant for students?
- How will we document the curriculum?
- What STEM principles will be the focus?
  - Inquiry
  - collaboration
  - problem solving
  - Representation
- What skills do we want/ need to develop?
- Assessment
  - How will the programs be assessed and by who?

4. Build STEM Curriculum and Resources

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With all 'new' programs, teachers can be reluctant to change from what it is they have known. Curriculum & Resources must be robust for staff and designed or integrated in a way that staff do not feel is a 'burden' or 'extra work' and is set at a level that they can easily deliver in their classrooms with students.

5. Seek STEM Partnerships

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- Industry
  - ✓ Collaborate with relevant STEM Industries
  - ✓ Create partnerships &build ongoing relationships
  - ✓ Identify STEM industry partnerships that complement your school STEM programs
  - ✓ Make connections with skills taught in classroom and practiced in Industry
  - ✓ Raise the awareness of students of potential career pathways for the 'jobs of the future'
- Tertiary
  - ✓ Link in with nearest Tertiary institution- they are the next step and link between schools and industry
  - ✓ Seek Tertiary Resource Opportunities (Facilities/ Expertise/ Programs/ Curriculum/ Student ambassadors)

5. Seek STEM Partnerships

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STEM is about raising awareness and making connections. Drawing Industry, Tertiary and School educational institutions together to provide students with the best possible STEM programs. Collaboration between these stakeholders is crucial- successful STEM programs cannot be sustained without proactive & fruitful partnerships.

6. Consider STEM Sustainability

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- How can you ensure that the STEM programs, philosophies and activities created can and will be sustained?
  - By ensuring that the STEM programs are suitably supported by School Leadership
  - By ensuring that the curriculum is robust &integrated into existing school curriculum effectively
  - By ensuring that staff are not only professionally developed to deliver it effectively, but they do not see the program as an 'extra' workload, they feel as if they have a buy-in with it, they can see the value and successes of the program(s) with students
  - Ensuring that you scaffold STEM programs throughout the student's educational journey
  - Ensuring that you celebrate every success
- Creating a School STEM Legacy
  - What will STEM look like at your school in 10 years time?

STEM at Grovedale now...

- The continued development of the Year 8 cross curriculum project
  - Problem solving/collaborative task - design and build a vehicle to travel the furthest distance down a ramp
  - 4 classes
  - 20+ staff members
- Year 8 Deakin Experience
  - 25 selected students spent a week at Deakin University completing Humanitarian projects
- Year 9 Sustainability Project
  - Develop a completely self sufficient town based on sustainable principles
  - Involves inquiry, problem solving and collaboration
- Year 9 STEM elective for 2017
- Year 10 STEM enhancement subject 2017
- Professional Learning Suite Term 4 2016

How would these relate to your school?

1. Support from leadership
2. STEM Professional Development
3. STEM Curriculum and Resources
4. STEM Philosophy
5. Building partnerships
6. Sustainability

Questions??

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