

Thinking like an Engineer: **Embedding EHoM within secondary subjects**

Janet Hanson and Teacher Heroes

Dissemination Conference
Royal Academy of Engineering
21 June 2016

8 Secondary Schools

- Bohunt School
 - Lindsay Davison, Jane Edwards, Jeremy Barber + others
- New Forest Academy
 - Sharon Crowe, Kennedy Chung, Lincoln Dugdale)
- Medway UTC
 - Amy Broome, Kieron Walsh
- UTC Reading
 - Jonathan Nicholls, Sean Kearns
- The JCB Academy
 - Ellie Sillitoe
- Bay House School & Sixth Form
 - Carole Terry
- Brune Park Community School
 - Stephen Shaw
- The Petersfield School (2014-15 only)
 - Jo Goodship

Embedding EHoM in secondary subjects

- Best time to introduce EHoM?
 - The best time to trial a new initiative like EHoM is in Years 7-9
 - But many schools start GCSE syllabus in year 9
 - UTCs have students for just 22 months from first intake to sitting their GCSEs

Embedding EHoM in secondary subjects

Bohunt School

Whole-school STEM programme for students in Y7/8/9, including foreign language group

EHoM developed in STEM and transferred to D&T, Science, Art & Design, PE

New Forest Academy

STEM Skills lessons develop creative problem solving (Y7)

Transferred to Science

The JCB Academy

EHoM used in English to engage students to transfer skills used in engineering to improve their English writing

EHoMs are a common language

UTC Reading & Medway UTC

Engineering

Science

Art

Pedagogies to develop EHoM

Build understanding

Visual: EHoM Icons

Popular culture: MEMES

Constant repetition by teachers

Whole-school assemblies

Create climate and reward

Prizes

Reward Postcards

Accept failure as opportunity to improve to enhance risk-taking

Careful use of praise for process

Teach it

Projects; use of structured design process

Teachers use prompts and questioning

Specific strategies taught to students

Practice, repeat, improve

Teacher modelling

Student Ownership

Students develop a 'growth mindset'

Industry endorsement helps

Student journals

Let's hear from our Teacher Heroes

- What Went Well
- Even Better If

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Thank you

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Further Education College

- Reading College (Activate Learning Group)
 - Scott Reilly, Fraser Glass, Jun Wang
 - from 2014-15 – Ian Campbell, Martin Davies, Noel Wood, Ben Mishi
- In October 2015 we started out with involvement from more colleges in the Activate Learning group, potentially City of Oxford College and Banbury and Bicester College, but...

EHoM in vocational qualifications

- EHoM not automatically applicable in BTEC diplomas
- BTEC courses are perceived by teachers to be very restrictive
- Many students on engineering courses do not know what engineering is

Pedagogies to develop EHoM

Build understanding

Engage students first, part-time students treat day in college as 'day off'

Build their understanding of engineering before tackling EHoM

Create climate and reward

Teacher has to stand back and be 'hands off'

Provide opportunities to take risks and maybe fail

Teach it

Resources on the VLE, stories of successful engineers

Flipped learning to give time to develop questioning skills in class

Employer-led problems for projects involving teamwork

Tinkering before theory

Student Ownership

Students mentor each other

Students 'come up with their own stuff'

Employer endorsement helps

Let's hear from our Teacher Heroes

- Despite constant turmoil in FE environment, innovating with EHoM is possible
- Opportunities for employer engagement-
 - Models 'Rowing, Steering or Cheering'
- -Scott to elaborate...

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