Embedding Authenticity in Assessments for Engineering Education

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Introduction

- Authentic assessments simulate workplace tasks
- Can enhance employability skills and student engagement
- Broad concept encompassing Problem Based Learning, Conceive-Design-Implement-Operate, Contextual assessment etc.

What our paper does?

- Characterises authentic assessment for engineering education
- Provide a framework to design authentic assessments in engineering

Paradigm and components

- Objectives/Paradigms of authentic assessment as:
  - Assessment as a tool for learning and self-improvement
  - Improve self-awareness

- Two components of authentic assessments:
  - Employability component
  - Globally conscious component

Characteristics – Employability component [1]

- Authentic assessment should enhance employability prospects
- Closed books exams replaced by regular assessments that mimic workplace tasks
- Assessments informed by industry/prospective employers

Characteristics – Employability component [2]

- Focus on supporting Knowledge, Skills and Behaviours required for employability

- Transferrable skills
  - Teamworking skills; project management skills; communication skills etc.

- Support development of behaviours
  - Growth mindset, adaptability, work attitude, concern for H§S etc.

Globally conscious component [1]

- Authenticity is deeply entangled with society and social practices
- Engineering has very strong societal impacts
- Engineers need to engage more with the public
- Help student:
  - reflect on their professional fields of interests and how that affect society at large

Globally conscious component [2]

- Complex problems and 'wicked problems' with many interacting components as assessment options

- Examples:
  - Affordable housing solutions; efficient transportation; efficient community water purification systems; pollution mitigation solutions etc.

Conceptual framework [1]

- Framework to help design authentic assessments
- Assessments should
  - Support both employability and globally conscious components
  - Reduce the risks of academic misconduct due to inappropriate GenAI use (context based)
- Continuous and regular assessments as opposed to end point exams

Conceptual framework [2]

- Promote self-improvement and self-awareness
  - Self-evaluation report; reflective blogpost; logbooks
  - Self-progress report based on module learning outcomes

- If the class size permits
  - Interviews and Q§A; debates; role plays

Guidelines – Employability component

- Conventional assessments focuses heavily on the Knowledge aspect
- Focus on Knowledge, Skills and Behaviours
- Involve prospective employers in assessment setting
- Embed transferrable skills and behaviours relevant to the module
- Professional competency identified by national/ international professional engineering bodies (e.g. CEng)

Guidelines – Globally conscious component

- Embed elements of liberal studies in both engineering curricula and assessments
- Support student understanding of societal and global impacts of the engineering field
- Examples:
  - How does culture and societal context affect a particular engineering design?
  - What roles could engineering play in reducing global inequality by improving access (to infrastructure)?

Conclusions

- Authentic assessments have potential to:
  - Reduce the gap between workplace demands and capabilities of engineering graduates
  - Make engineering graduates more globally conscious
- More institutions should consider exploring authentic assessments
- Further research based on empirical evidences will help analyse effectiveness of authentic assessments

Thank You!