

Engaging with the Community - Collaboration in EER

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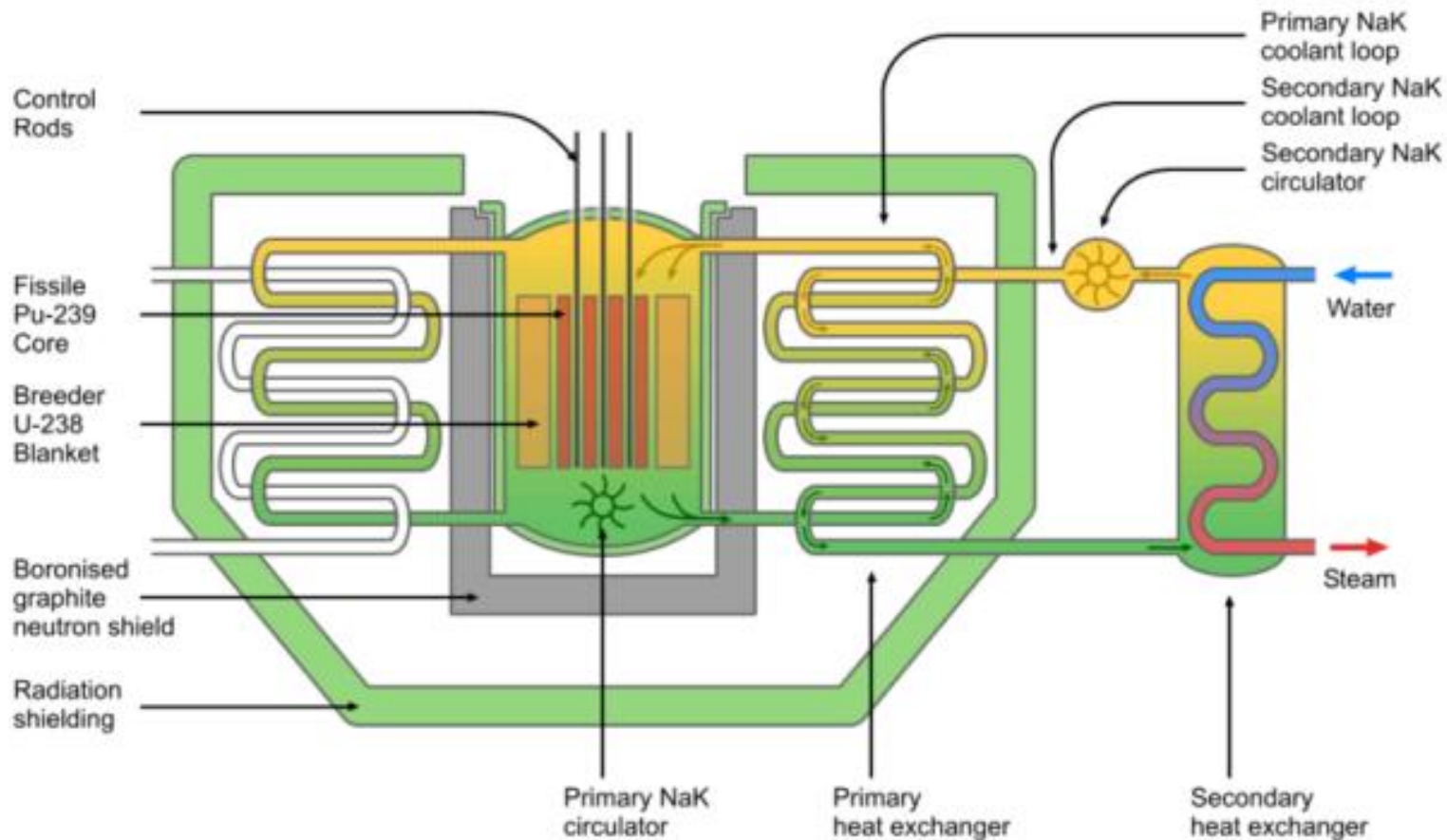
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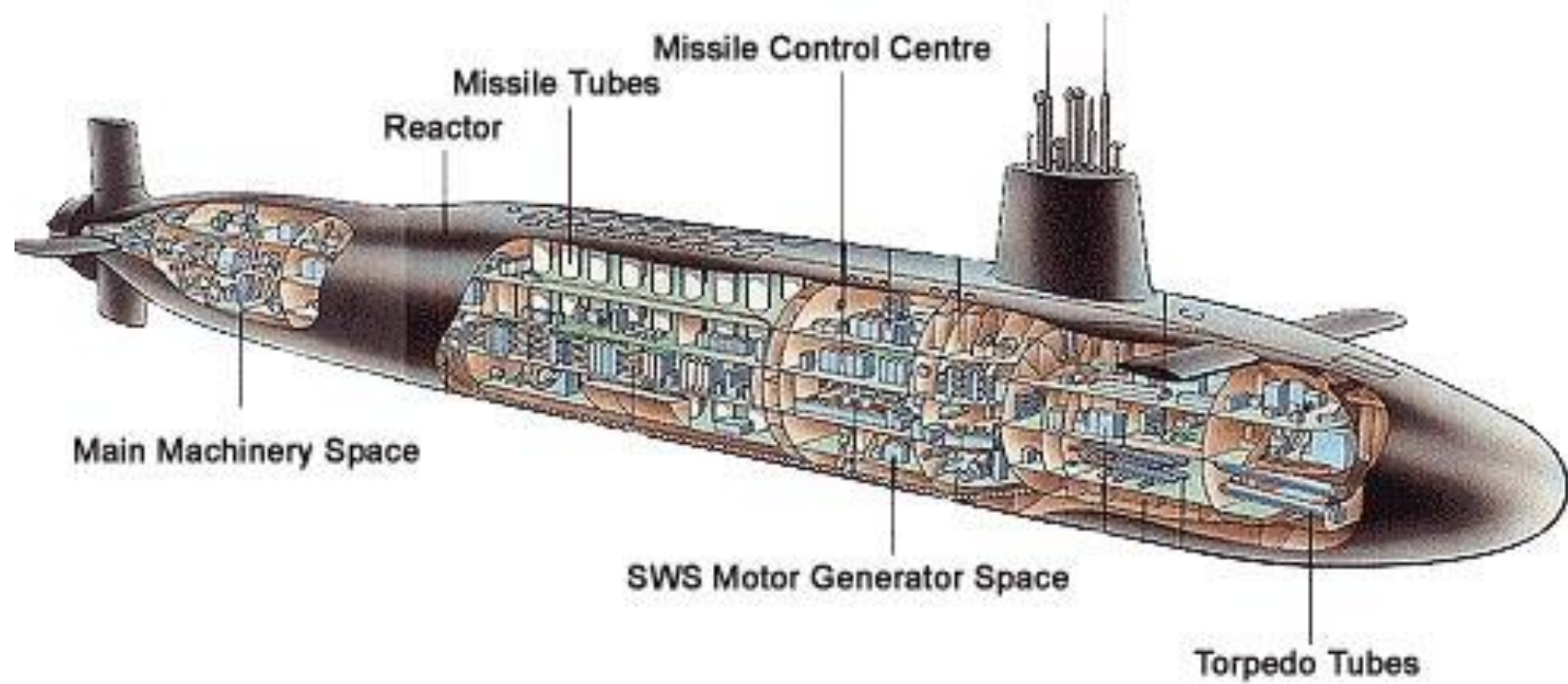
What we will cover

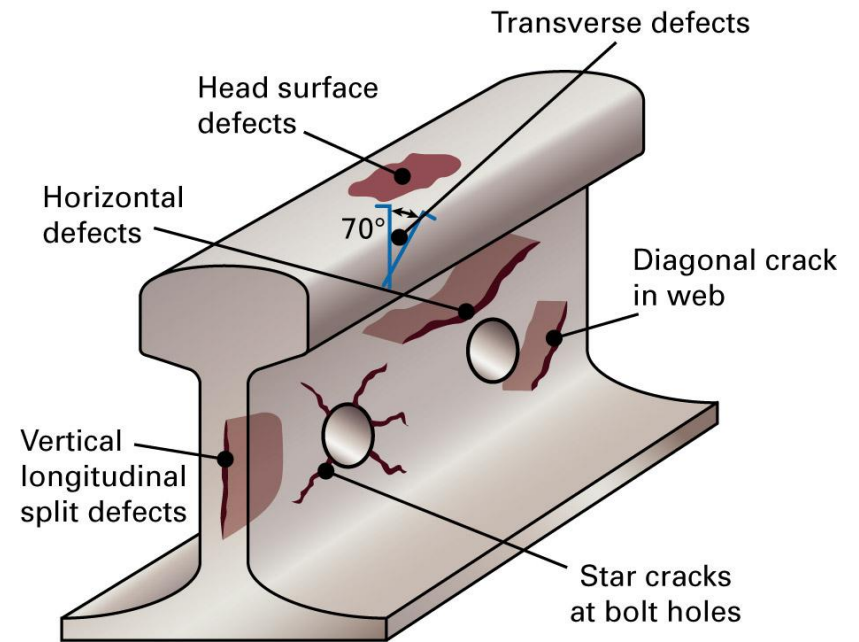
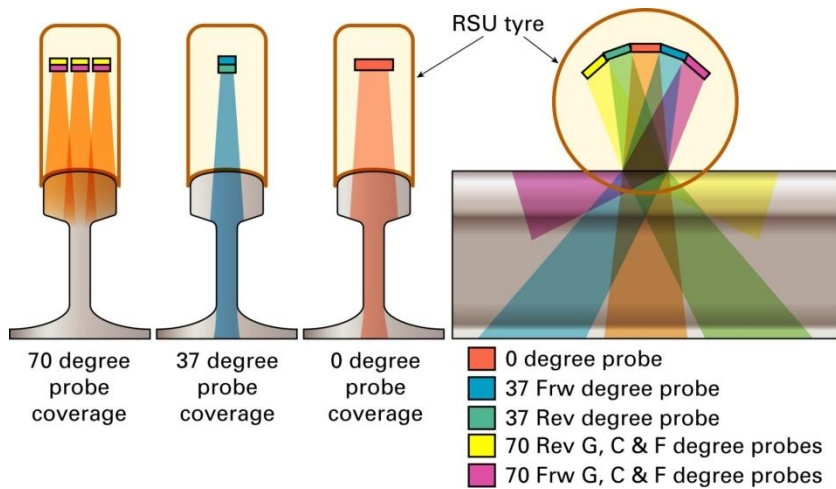
- EER
- Writing and where to look
- Collaboration
- Some conclusions

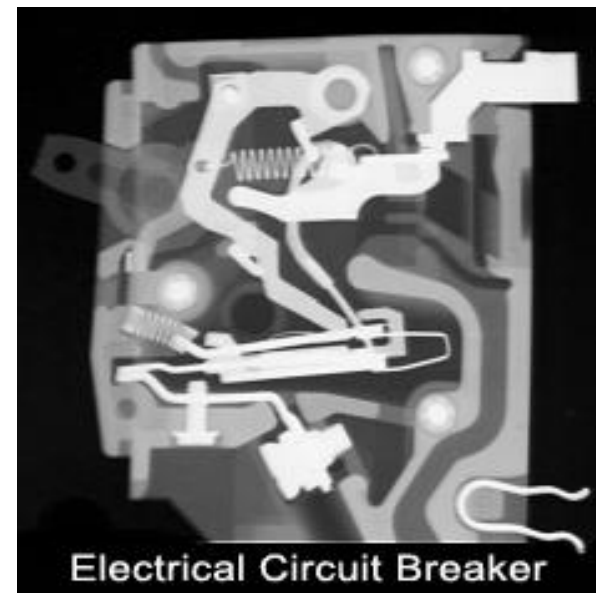
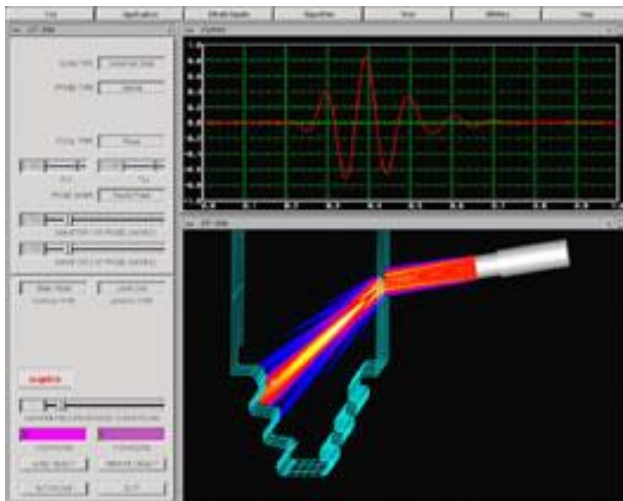
Who am I?

- BSc(Eng) Mechanical Engineering from UCL
- PhD Mechanical Engineering from UCL
- MBA from Western Connecticut State University
- PGCHE from Aston University
- FIMechE, MCMI, MInstNDT, FHEA
- CEng, CMgr
- National Teaching Fellow











Now ...



EER – does it have an identity?

- It's getting there!
- Active global community
- Patchy in places, strong in others



It is tough!

- Barriers
 - Recognition
 - Credibility
 - Purpose
 - Feeling of a constant need to justify ourselves
- Challenging
 - Blending the disciplines is not trivial!
 - Funding opportunities

Looking at Europe

- SEFI Engineering Education Research Working Group
 - Aalborg 2008
 - Trnava 2010
 - Lisbon 2011
 - Leuven Summit 2011

Focus

- Building a European Community
 - What is going on?
 - Developing a taxonomy for EER in Europe



Trnava 2010

Building the Foundations

- Engagement and Training
- Outreach and Collaboration
- Visibility and Dissemination

Thoughts

- Barriers – recognition
- Position paper
- Differences as opportunities
- Don't 'reinvent the wheel'
- Promote national groups and co-operation across countries
- Face-to-face networking
- Roundtable at conference
- Develop website for the community
- Engineering Educators Exchange Network
- EER in pedagogical training
- Evidence

Trnava 2010

Taxonomy for EER in Europe

- EUGENE drive

Thoughts

- Common framework and language
- Objectives
 - Describe the landscape
 - Recognise expertise
 - Set priorities
- Taxonomy by ...
- Exclusive or inclusive
- Guide newcomers
- Object or purpose
- Literature characterisation

Outcomes of education	Process of education	Stakeholders of education	Organisation for education (academic social world)
Ultimate purpose Sustainable society (social, economical and ecological)	International / national level	Society - incl taxpayers	Context (society, profession)
Values Critical thinking, diversity, creativity, innovation, intellectual rigour, ethics	Institutional level	Students and family	System structures - rules, managing structures
Engineering competences Integration and application of knowledge. Enabling skills (incl teamwork, communication)	Curriculum (program) level	Working life - industry, professional bodies, practicing engineers, graduates	Praxis within the organization (what people do)
Technical knowledge Conceptual understanding of content	Course (module) level	Higher education/university	Culture (what people say and think)
	Learning activity	School	Identity (who people are or see themselves)

Leuven 2011

- Workshop and sessions in Lisbon the ‘best ever’
- Develop the ideas further
- EJEE papers for 2012 / 2013
 - State of the Art (Robin)
 - Taxonomy (Lauri)
 - Methodologies (Jonte)

What is the value of EER?

- Research based development of EE
- Theories and methodologies come from educational research ... but we need to adjust
- Research relevant to practice
 - Research questions and topics
 - Relevant methods
 - Dissemination of results within the community
 - Understanding the discourse of EE - especially the language and concepts

Creating some clarity

Excellent teaching	Involves good content and teaching /learning methods
Scholarly teaching Engineering education development	HOW TO DO IT
Scholarship of teaching	WHAT CAN I LEARN AND HOW TO DO IT
Engineering education research	research questions, research methodologies, theories and critical interpretation of the results, research training – WHAT ARE THE REASONS AND WHAT COULD BE POSSIBLE SOLUTIONS

Where do we want to be?

- PhD in EER
- Successful applications for EU funding
- Build on the discussion – networks
- Engage more people
- Workshops for PhD students
- More freedom to do things we want
- Focus on achieving good results
- Deans and provost as part of the networks
- Acceptance of activities

And more

- Overview of activities and not only focus on English language – mapping what is going on
- Collaboration and learning different subject languages / concepts
- Shared understanding of excellence in EER
- Seminars for young professors ... post graduate programme
- Recognition for EER – academic and political and in practice
- More international collaboration
- Getting more in contact with companies ... and users of EER

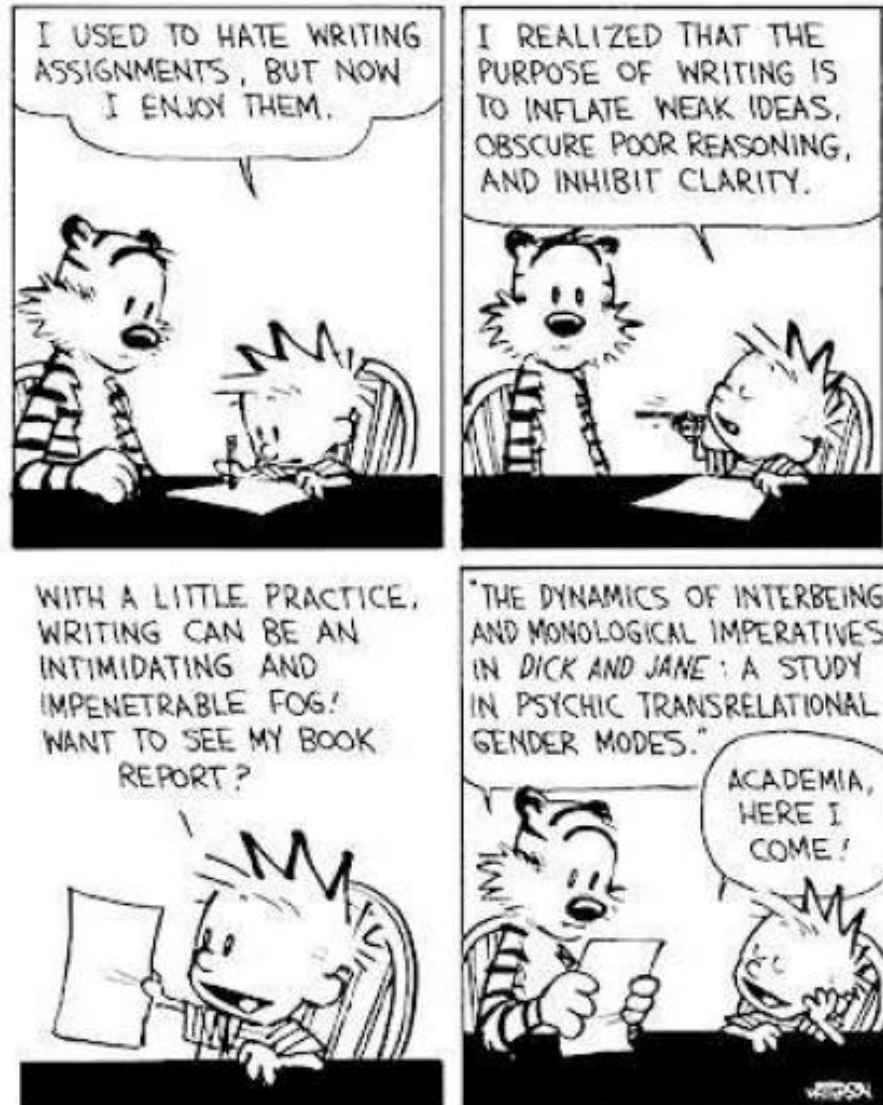


Driving Change

- Educational
- Industry / Professional
- National / International

- Don't forget the students!

Something to consider



Writing a Research Paper (1)

- **Conception: Introduction**
 - Aim / objectives of paper. Gap in knowledge. How paper achieves aim / addresses gap in knowledge
- **Context**
 - Background information. Usually literature review. But also any relevant background information that is not methodology. Main theories and concepts may be discussed at this stage
- **Content**
 - Methodological approach – clear outline of methodology. Justification of methodological approach (why, limitations)

Writing a Research Paper (2)

- **Content**
 - Description of findings (either quantitative or qualitative) (presentation and descriptive comment)
- **Critique**
 - Analysis & critical discussion of findings
 - Conceptualisation / Contextualisation of findings
 - Identification of emergent themes
 - Discussion regarding how research has contributed to knowledge (refer to previous knowledge)
- **Conclusion**
 - Future research possibilities
 - Concluding remarks. Draw together rest of paper. Clearly articulate value of paper



Group thoughts

- In a small group, capture your collective thoughts on the following questions
- Where do you publish?
- Where do you go to explore the literature?
- What challenges do you experience in your writing / literature work?

Where do you publish?

- University journals (database listed)
- Proc of conferences
- KOLI Calling
- Driven by local requirements
- Challenges of ISI
- High impact factor, quality journals
- Conference size – smaller is often more helpful for good feedback
- Consider the levels – start small (poster or a small conference) and build from there
- Take full advantage of reviews you receive and develop wider knowledge of the field and players – gain confidence

Where do you go to explore the literature?

- ACM
- IEEE Xplorer
- Accessible sources!
Some cost and aren't available even through university
- Google Scholar
- Open access sources
- Academics themselves
- Copy details and search Net using Google
- Look for similar articles
- EU project reports (if can't obtain papers)

Challenges in writing / literature work?

- Page limits
- Logic of the paper
(learn from published work)
- Practice
- English – doesn't need to be perfect and many reviewers will understand this (some won't)
- Constructing a good argument, concisely
- Reviews – use them and try to do some yourself

Where do you publish?

- Context
- Conferences – SEFI
- EE Conferences – REES
- Book chapters
- Recognition – citation report – IJEE, EJEE(?), Proc in Social Behaviour
- In house journal (Barcelona) – 1st step
- 5 EE Journals
- JEE, AJEE, EJEE, IJEE, IGIP, IEEE Trans, EE, Assess and Eval in HE
- Specialist – Technology Management
- Theme specific conferences – Timber
- EARLI conferences

Where do you go to explore the literature?

- ERIC database
- People – specific authors, sharing with knowledgeable people
- Google and database search tools
- Google Scholar
- Scopus
- Web of Knowledge
- Questions to colleagues
- Knowing the people
- Literature Review papers
- Journal
- Website of ASEE – member for small charge
- Informaworld
- AAEE
- Regional groups
- COP websites

Challenges in writing / literature work?

- Context squared
- Time
- EER as a sideline
- Conf v Journal competition
- Overlap of fields challenge – negotiate successfully
- Objectives definition – needs to be clear
- Appropriate and helpful ethics process in institutions
- Get enough quantitative data for results
- Select the right methodology to suit your work
- Good structure
- Conference limitations
- Lack of standards in a growing field
- Skewed standards to match experience
- Language

Why is this important?

- We need to share otherwise ...
- Raise the bar
- Cross-disciplinary working
- Find solutions e.g. 'mentors across borders'
- Send a more coherent message

Sources

- Journals (EER and Practice / Pedagogical Research and Practice) [Journal of Engineering Education](#)
- Conferences
- Reports (Government / Industry)
- Project websites (e.g. EUGENE, National HE STEM) [National Higher Education STEM Programme](#)
- [cleerhub](#)



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Advancing global capacity for engineering education research: relating research to practice, policy and industry

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Findings are presented from a series of moderated interactive sessions held at international engineering education conferences between July 2007 and December 2008, where attendees discussed the current state and future trajectory of engineering education research. More specifically, this study examines how session attendees described: (1) the relationship between engineering education research and educational practice, policy considerations and industry; (2) important stakeholders, mechanisms/strategies and challenges for relating research to practice, policy and industry. Thematic analysis and open coding procedures were used to analyse the data collected at each session. In summary, frequent discussion and widespread consensus was observed about the need to relate engineering education research to the practice of engineering teaching. Discussions about relating research to policy and industry remain formative, but appear to be gaining traction. The paper concludes by proposing a cyclic model to better conceptualise how engineering education research can be strategically related to practice, profession and industry across diverse local and global contexts.

Networks and Collaboration

- A way to extend your knowledge and experience in the field



Collaboration

- What does it mean to you?
- How do you identify potential collaborators?
- What do you see as the challenges and benefits?

Where can I look?

- [SEFI](#)
- [Nordic Network](#)
- [EER SIG](#) (HEA in UK)
- [ASEE](#) (Educational Research and Methods)
- [AAEE](#) (ERM via Wiki)
- [CREE](#)
- [iNEER](#)
- [REEN](#)
- Individual universities / projects e.g. Aston, Aalborg, Purdue, ECUST, Melbourne ...
- [EUGENE](#)



The UK Example

- National network – UK SIG supported by HEA
 - 40+ individuals
 - Website
 - Meetings
 - Recognition!

Aims of the SIG

- to develop an effective Engineering Education Research community in the UK promoting rigorous EER.
- identification and engagement of members of the engineering education research community both UK and internationally,
- to identify shared areas of research interest for colleagues,
- to identify funding opportunities and promote collaboration,
- to identify professional development needs and opportunities.

Conferences

- SEFI Annual Conference
- Engineering Education in UK (next in 2012, generally July)
- ASEE – Annual Conference (June), Frontiers in Education (September), Global Colloquium (October)
- AAEE Annual Conference (December)
- ICEE / ICEER
- CREE / SEESA
- REES (Madrid in September 2011)
- ECUST (Shanghai, October 2009), ISPBL (UK, November 2011), Malaysia (June 2010), ALE (Chile, January 2011) ...
- Don't forget the more generic LTR conferences – HERDSA, ISSOTL, SRHE (UK) ...
- Consider conferences related to science and maths education
- Websites will guide you to other smaller regional meetings e.g. [E2L](#)

What and How?

- Everything and all ways!
- Attracting young people (and keeping them)
- Active Learning
- Technology in Learning
- Competencies
- Employability
- Mixed methods
- Longitudinal
- Action Research / Exploratory work

Some thoughts

- Don't be shy in reaching out
- People will likely be pleased
- It will likely open doors to more up to date knowledge and resources
- People have preferences, hence sub-communities exist
- EER on the increase
- Be clear – what is your contribution to knowledge (education / technical discipline)?
- Early days, momentum is building

Funding

- Collaboration adds an additional dimension
- International component
- Become a project partner
- Offer / share data
- Offer / share instruments

To Conclude

- Welcome to the community
- You are doing something important
- Be passionate, ask questions and get involved
- Good luck!!

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