Exploring the Significance of In-Process Knowledge to Composite Design and Production

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“The Dibber”

- What it is?
- Why it is important?
- How it is being used for this research
“The Dibber”

• What it is?

• Composites manufacturing route
  – Predominantly hand lay-up
  – Ingrained are handmade and personally owned tools
Why is it a problem that laminators make their own tools? How is it linked to the problems faced by the industry?

Unstandardised process that is poorly understood
- Heavily reliant on tacit knowledge
- Lack of knowledge base

Low production rates and capabilities
Ability to develop the supply chain
Training workforce with composites skills

Manufacturability issues
- Defects, high scrap rates and increased costs

“The Dibber”

- Why is it important?
  - Laminators’ in-process knowledge
  - Unstandardised process

“Dibbers are made for jobs”
Exploring Designing with Composites

- Where do the problems start?
- Why do we have them?
  - Start in design but manifest themselves in production
  - Training designers
    - Sectors have history built on metal design
    - Not trained in designing components with composites materials
  - How new knowledge is integrated
    - Lack of integration results in no standardised codes of practice
    - Developing craftsman in production
Knowledge and Learning

- **Background Theory**
  - How should knowledge in new product development get incorporated into a learning cycle?

Results

- Composites industry has an incomplete learning cycle
  - Tools are being “made for jobs” on the production shop floor
  - Not formalised recognised as part of the production process (e.g. on MIS)
  - Laminators are generating material knowledge in production
  - Laminators’ knowledge remains tacit

Further Work

• Using “The Dibber” a craft can be explored as a standardised industrial setup process
  – Can the tools become an integral part of a manufacturing instruction sheet?

• Develop mechanisms to transfer tacit knowledge to complete the learning cycle
  – Could its integration help the industry to overcome the challenges that it is facing as it is looking to grow?
Thank You!

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