



UNIVERSITY OF  
LINCOLN

# Assessing Competency in the Laboratory

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Dr Mark Baron

Forensic and Biomedical Sciences

BSc Forensic Science



# Why do we need to assess competence?

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- Programme and Module Learning Outcomes
  - *‘demonstrate skills in .....’*
  - *‘demonstrate competence in .....’*
- Accreditation – FSS Laboratory Analysis
  - *‘demonstrate competence in.....’*
- We need to know? Students need to know?
- Employers - provide relevant work related laboratory experience
  - e.g. individually be able to carry out routine analyses competently

## Is there a problem?

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- Resources for laboratory work
  - Limited appropriate analytical equipment
  - Limited time
  - Limited individual training
- Group work and assessment related to the laboratory experience
- Does this improve individual skills?
- Does this address LOs and assess competence?

# Laboratory Competency in what?

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- Forensic Analytical Chemistry
- Level 3 Modules
  - FRS3041 Forensic Toxicology (s.1)
  - FRS3042 Fire and Explosion Investigation (s.2)
- Underpinned by training at Level 1 and 2
- Casework experience
- Sample preparation and analysis in forensic context

## What have we done?

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- 3-hour Competency Test in FRS3042 (2006-07)
  - Organised in groups; work individually
  - extraction and GC-MS of a swab containing an explosives residue
  - analysis of a white powder by ATR-FTIR
  - Assessment
    - Results (Qualitative) (35 %)
    - Laboratory Notes (25%)
    - Data analysis and interpretation (40 %)

# Evaluation

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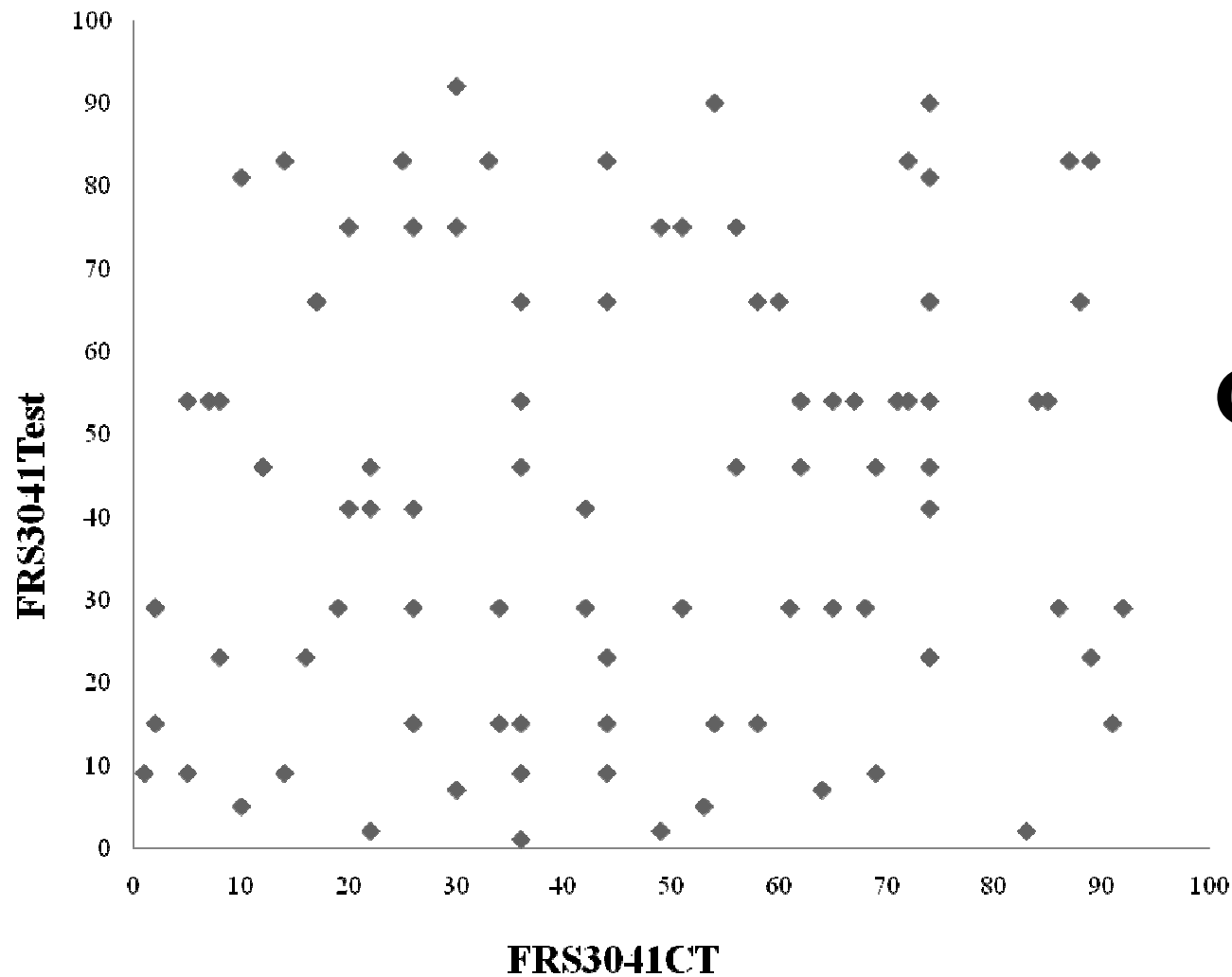
- Low overall marks (mean 49%; s=9%)
- Why?
  - Poor extractions
  - Limited data analysis and conclusion relevant to the case
  - Poor keeping of laboratory notes
  - Poor time management and lack of confidence

## Changes for 2007-08

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- CT in FRS3041 Forensic Toxicology
  - Sample preparation and headspace analysis of ethanol in blood (GC-FID) - Quantitative
  - Group calibration with individual analysis of own sample- some time for individual evaluation
  - Assessment – submit a results proforma
    - Calibration (25%)
    - Confirmation (10%)
    - Precision and accuracy (65%)

# FRS3041 CT vs Knowledge test

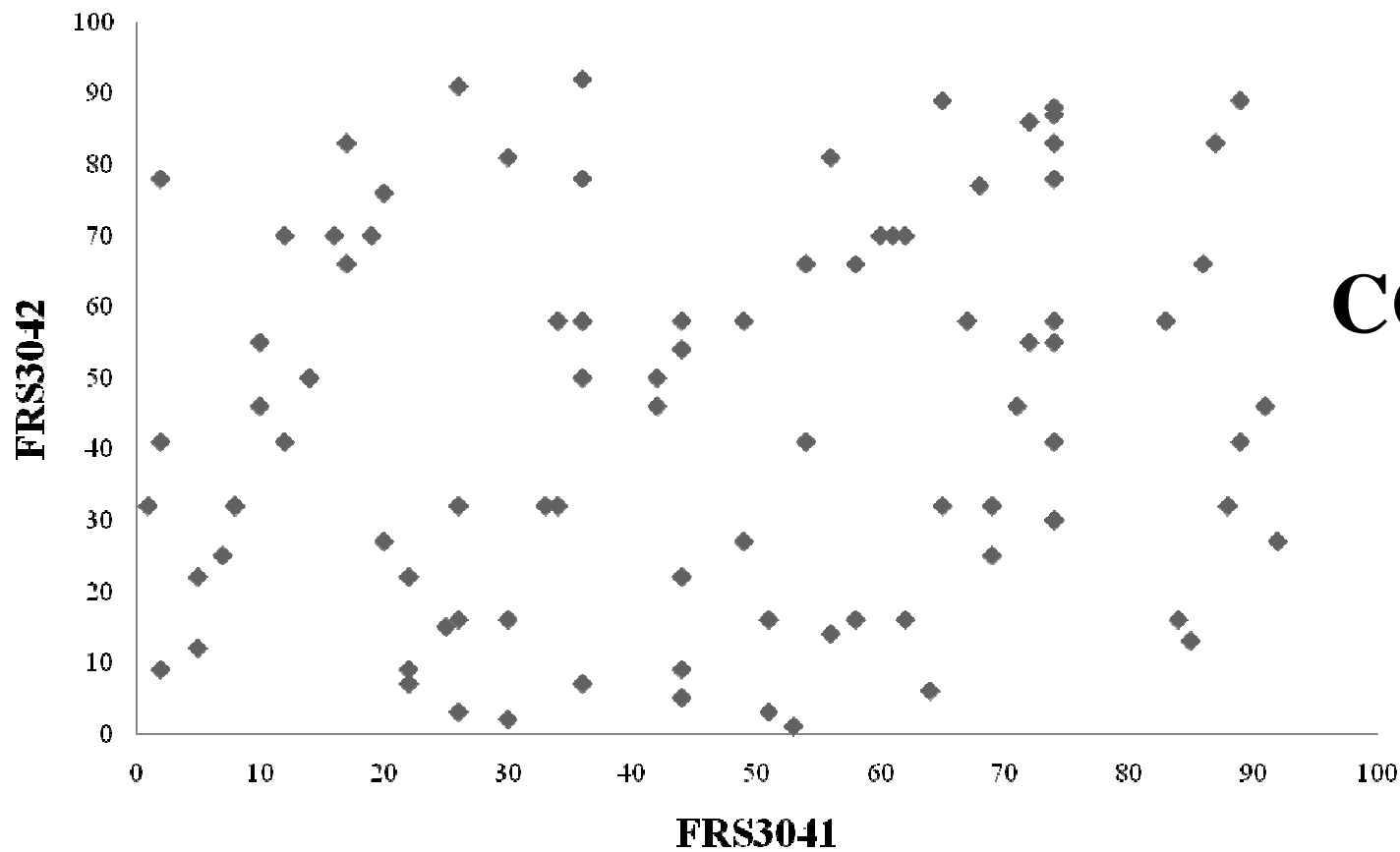


## Evaluation

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- Did additional FRS3041CT improve performance in FRS3042 CT?
  - No significant difference between the mean marks for 2006-07 and 2007-08 cohorts
- Students better organised and prepared for the competency test- one of concerns from 2006-07
- Poor lab notes and data analysis
- Why no improvement in performance?

# Poor correlation between rank order in the two competency tests



## Further Changes for 2008-09

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- Pre-lab seminars in FRS3041
- Look at how we are measuring ‘*demonstrate competence in .....*’
- Broaden skills assessed in FRS3041 to support FRS3042
- Improved Level 2 training in techniques and interpretation
- Aim: Improve the competence of all students in the laboratory