Learning Analytics & Educational Data Mining
FP7 Objective ICT-2013.8.2 b

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Who Are We?
Kingston University is in South-West London

- **Longitudinal Statistics Research Group:**
  - 7 Academic Staff, 4 Researchers
  - Data Mining, Pattern Recognition and Modelling of Large Datasets:
    - Language Data (BNC)
    - Medical Data (GP Records)
    - Data on Ageing, Health & Exercise (UK Cohort Study)
    - Educational Data
      - UK Cohort dataset
      - “Nooblab” Data

- **Learning Technology Research Group:**
  - 6 Academic Staff, 4 Researchers
  - Projects on developing & evaluating ICT Tools for Enhancing Teaching and Learning, particularly for Computer Science and Mathematics:
    - “Aqurate” & “MathAssess” tools for assessment & feedback
    - “Nooblab” environment for teaching & learning of computer programming
  - Influence on Pedagogy
Relation to Call  
(FP7 Objective ICT-2013.8.2 b)

• “... tools and processes for collecting, storing, exploring and reasoning on large-scale educational data to better understand learners' knowledge, assess their progress and evaluate environments in which they learn. These tools and processes should aim at improving learning and teaching (including 21st century skills) for students and instructors. These tools should be equipped with intuitive interfaces for visualizing and interacting with the data in order to ease their integration into the practice of teaching and learning. Cognitive models of learning styles should be provided and tested against actual data sets that record inputs, behaviour and assessment outcomes ...”

• Expected Impacts include:
  – “Broaden use of ICT in education in at least one curricular topic leading to wider take up by end-users ...”;
  – “More efficient use of ICT for learning through the exploitation of learning analytics tools ...”;
  – “More timely and effective acquisition of skills/competences through learning technologies ...”;
  – “Increased awareness on the benefit of the adoption of learning technologies.”
What We Can Offer

• Experience in development and evaluation of ICT-based teaching, learning & assessment tools and environments (e.g. MathAssess and Nooblab);

• Development and use of both visualisation and statistical methodologies for pattern identification and analysis within large educational datasets (including data produced by above tools);

• Use of these methods and tools in evaluating approaches to teaching & learning within various disciplines, and interpreting the outcomes in terms of pedagogical and cognitive theories and models.
Example: Data-Logging and Visualisation Tools (from the “Nooblab” Environment)

- Logging of all interactions made by each student
- Provides rich data for statistical pattern analysis
- Visualisation of a student’s progress through course using the environment
- Enables behavioural / learning patterns of individual students to be studied, analysed and compared.

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Example Research Question

• “How does use of a particular student-centred on-line tutorial tool influence students’ learning and understanding of differential calculus ?”

• Metrics :
  – Qualitative evaluation of experience by students;
  – Pre- and post- experience performance in “standard” exercises for both “test” and “control” groups;
  – Measurement of interaction parameters : time spent using tool, number of on-line formative exercises undertaken, ...

• Analysis using multivariate statistical methods.
If interested in working with us ...

- Contact us!

- Statistical Pattern Recognition & Data Mining
  - Gordon Hunter  G.Hunter@kingston.ac.uk

- ICT-Based Educational Tools, Pedagogical Theory
  - David Livingstone  D.Livingstone@kingston.ac.uk
  - Paul Neve  P.Neve@kingston.ac.uk

- Or look at our web pages: