Capturing excellent educational outcomes
Measuring students’ learning gain

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Aims

Develop a context-appropriate theoretical understanding of learning gain

Develop an instrument to measure learning gain

Test measurement instrument: reliability, validity and at-scale usability

Test a longitudinal model of learning gain in relation to student background characteristics, contextual factors, and existing measures of ‘academic success’
Approach

In-depth interviews with students

Exploring their understandings and perspectives on learning gain

New measurement instrument

Developed from combination of existing evidence and new input from students, tested and piloted

Longitudinal survey using above instrument

Three points in time, tracking learning for ~3000 students

Matching to administrative data wherever possible
## Partners

<table>
<thead>
<tr>
<th>9 partner universities</th>
<th>Disciplines:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russell Group</td>
<td>Medicine</td>
</tr>
<tr>
<td></td>
<td>Business Studies</td>
</tr>
<tr>
<td></td>
<td>English</td>
</tr>
<tr>
<td></td>
<td>Chemistry</td>
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</tbody>
</table>

### Student profiles:
- UG and PG
- Full- and Part-time
- All modes of study
- Home, EU, and international
- First and subsequent degrees

### Interviews:
- 34 students in 3 universities

### Survey:
- 3000+ in Round 1
Aim:
Develop a context-appropriate theoretical understanding of learning gain
What is learning gain?

The improvement in knowledge, skills, work-readiness, and personal development made by students during higher education (RAND, 2014).

The change (potentially, progress) in the knowledge, skills, and competencies that are relevant across disciplines made by students during higher education (Vermunt, Vignoles & Ilie, 2016).
## Knowledge, skills, and competencies

<table>
<thead>
<tr>
<th>Cognitive</th>
<th>Meta-cognitive</th>
<th>Affective</th>
<th>Socio-communicative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical thinking</td>
<td>Self-regulation</td>
<td>Attitudes towards own discipline and learning/studying in general</td>
<td>Levels of belonging in social learning networks</td>
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<tr>
<td>Analytical thinking</td>
<td>Life-long learning attitude and motivation</td>
<td>Motivation</td>
<td>Social embeddedness</td>
</tr>
<tr>
<td>Reasoning abilities</td>
<td>Learning to learn</td>
<td>Engagement</td>
<td>Communication skills</td>
</tr>
<tr>
<td>Synthesising</td>
<td>Need for cognition (information seeking)</td>
<td>Professional and academic interest</td>
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</tr>
<tr>
<td>Analysing</td>
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<tr>
<td>Evaluating</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Problem solving</td>
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</tbody>
</table>
### Cross-cutting dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Openness dimension</strong></td>
<td>Open-mindedness; View of intelligence; Epistemological stance</td>
</tr>
<tr>
<td><strong>Research dimension</strong></td>
<td>Curiosity; Interest in research ; Interest in knowledge; Attitude to sharing ideas</td>
</tr>
<tr>
<td><strong>Moral dimension</strong></td>
<td>Moral reasoning</td>
</tr>
</tbody>
</table>
Aim: Explore students’ perspectives on learning and learning gain
Student Interviews

34 students in 3 partner universities
  Undergraduate and post-graduate
  First and subsequent degrees
  Home, EU, and international

Asked about their learning, and the skills, capabilities, and knowledge they are acquiring in their studies
Students: ranking of dimensions

Critical Thinking

Time management

Communication skills

Curiosity

Motivation to learn

Problem solving

Engagement with subject

Interest in knowledge

Open-mindedness

Most Important
Students’ own dimensions

Adaptability  Flexibility
Emotional resilience  Resilience
Perseverance  Efficiency
Abstract thinking  Strategic thinking
Self-management  Team work

Remembering there is life outside the degree
Students’ perspectives

Large variability in students’ ability to reflect on their own learning processes, but high engagement throughout

Content knowledge and skills/abilities/competencies inextricably linked

Extra-curricular activities and work further support students’ development

A lot of the skill/ability/competence development is implicit
  When explicit, it is seen as better when clearly related to content knowledge
Students’ perspectives

Stand-alone modules, courses, or sessions are appreciated
Students want more of them;
also want more engagement with them from their peers
and want to see them followed up throughout their degree

However: subject differences
Business & English (to some extent): “transferable skills”
Chemistry: practical skills (e.g. lab work)
Medicine: shift in emphasis from pre-clinical to clinical stages
University staff: ranking of dimensions

Critical Thinking

Problem solving  Open-mindedness

Curiosity

Communication skills

Synthesising information

Engagement with subject

Motivation to learn

Making ethical and moral decisions

Most Important
Aim:
Develop a measurement instrument to capture learning gain
Measurement

- Deep thinking and reasoning ability
- Self-regulation, including time management, and resilience
- Engagement with learning and subject
- Communication skills: conceptions of academic writing
- Epistemological beliefs
Welcome to the LEGACY Learning Gain Survey, run by the Faculty of Education University of Cambridge.

LEGACY is a research project coordinated by the University of Warwick, and funded by the Higher Education Funding Council for England (HEFCE). The aim of this survey is to understand how students learn in higher education, and how that learning develops over time.

You will receive a personalised link to an on-line questionnaire, three times over the next 2 years. Each survey will take approximately 30 minutes to complete. For each round of the survey you complete you will receive an online voucher for £5.

All your responses to this questionnaire will be treated confidentially, and only presented in aggregate form.

If you participate in all three rounds of the study, you will be entered into a raffle to win tablets, smart watches, and other electronic devices.
Measurement

3 survey rounds
  November 2016 – just completed
  April/May 2017
  March/April 2018

With support from partner institutions

Personalised link to each student, to facilitate longitudinal tracking

Linkage to administrative data
Study outputs

The core dimensions of student learning gains across a select number of different disciplines identified

Empirical assessment of the tool developed to measure learning gain, and establishment of its validity and reliability

Empirical evidence as to students’ learning gains over time

A better understanding of the potential to measure learning gain at scale
Links to teaching excellence

Longitudinal explanatory model of student learning gains
- accounting for a range of personal and environmental factors
- and also for a range of ‘teaching excellence’ factors
Conclusions

For any measure of learning (and learning gain) to be valid, it must capture the learning dimensions put forward by a conceptual framework embedded in existing literature but aware of contextual issues reflect students’ views and incorporate universities' declared aims
Thank you.

Contact: learning-gain@educ.cam.ac.uk