# PILOTING MEASURES OF LEARNING GAIN AT UNIVERSITY OF EAST ANGLIA, NORWICH

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# INTRODUCTION

- 'Piloting Measures of Learning Gain in Higher Education' is one of the HEFCE-funded projects on developing measures of learning gain in HE.

- The paper is set within the wider national HE context in terms of teaching excellence, student outcomes and metrics on learning gain.

- We have taken a cross-sectional approach, looking at different cohorts and disciplines .

- We examine three different ways of measuring of learning gain, considering potential strengths and weaknesses.

- Today we outline of emerging, preliminary, findings from phase 1 of the project

- The significance of the UEA project in informing future debates about assessment of HE quality is also considered.
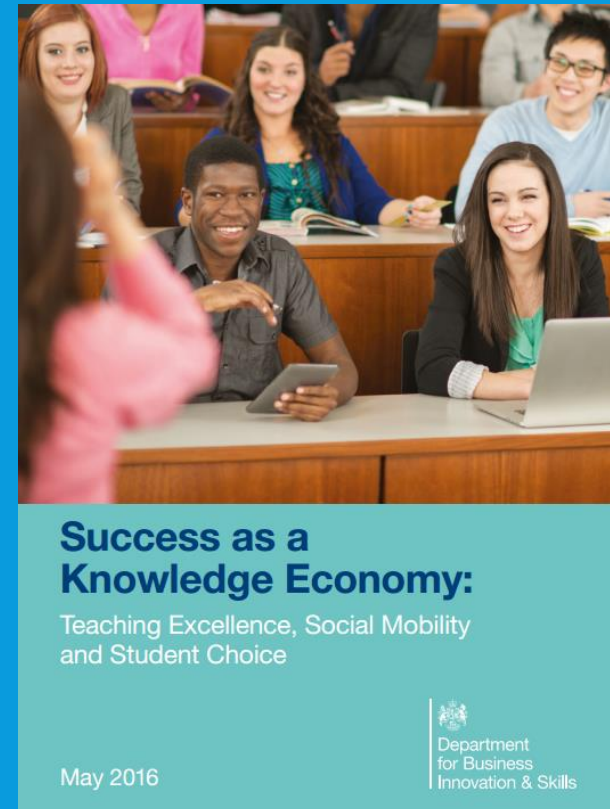
# WHAT IS LEARNING GAIN?

# THREE DEFINITIONS OF 'LEARNING GAIN'?

1.  Project working definition *At its simplest, learning gain might be best understood as the 'distance travelled' by a student – that is, the learning achieved between two points in time which could be the start and end of a course or programme.*

2.  HEFCE (2015)* has defined learning gain as follows "*the improvement in knowledge, skills, work-readiness and personal development made by students during their time spent in higher education*".

3.  Learning Gain as 'value added' – as used in the Guardian League Table*

    Learning gain is an <u>absolute measure</u> of progress while value-added is more a <u>relative measure</u> of progress – relative to the progress that might typically be expected.

    "*The first stage in calculating a value-added score is to assign each student a probability of being awarded a good [honours] degree. This is achieved by categorising students into entry bands based on the type of qualifications they enter with and, where possible, their grades. The total proportion of students being awarded a 1st/2:1 within each entry band is taken as the probability of each student within the entry band being awarded a good degree.*"

- <u>http://www.hefce.ac.uk/lt/lg/</u>
- https://www.theguardian.com/education/2015/may/25/methodology-behind-the-guardian-university-guide-2016

# WHY IS IT IMPORTANT NOW?

# CONTEXT: CHANGING NATURE OF HE IN ENGLAND

- Increasing tuition fees

- Uncapped recruitment and fiercer competition

- New providers in the sector

- The Teaching Excellence Framework



**Success as a Knowledge Economy:**
Teaching Excellence, Social Mobility and Student Choice

May 2016

Department for Business Innovation & Skills

# THE UEA PROJECT

We aim to:

- Assess the relative benefits and disadvantages of each approach – can these approaches offer us new dimensions to measuring learning gain?

  The three different metrics are:
    - Student marks/grades/GPA
    - Self-efficacy
    - Concept inventories

- Assess the potential institutional opportunities and barriers to the adoption of these approaches
- Assess the suitability, transferability and scalability of these measures

# HOW ARE WE EXAMINING LEARNING GAIN?

… and what have we learned so far….

| Discipline | Student marks/GPA | Self-efficacy | Concept inventories | Phase 1 (2015-16) | Phase 2 (2016-17) |
|---|---|---|---|---|---|
| Chemistry: one UG module | √ | √ | √ | 100 students | TBC |
| Economics: one UG module | √ | √ | | 250 students | TBC |
| Biology: one UG module | √ | | √ | 200 students | TBC |
| Pharmacy: one UG module | √ | | √ | 100 students | TBC |
| Psychology: one UG module | √ | √ | | 200 students | TBC |
| City College Norwich (partner college): two HE access courses | √ | √ | | 400 students | TBC |
| Nursing: one UG module | √ | √ | | | √ |
| Humanities: two foundation year modules | √ | √ | | | √ |

# STUDENT MARKS/GRADES/GPA

- The table shows (by average mark over 5 years / school of study):

- Average mark gain/loss from stage one to final

- Average GPA gain/loss from stage one to final

- Banded GPA gain/loss from stage one to final
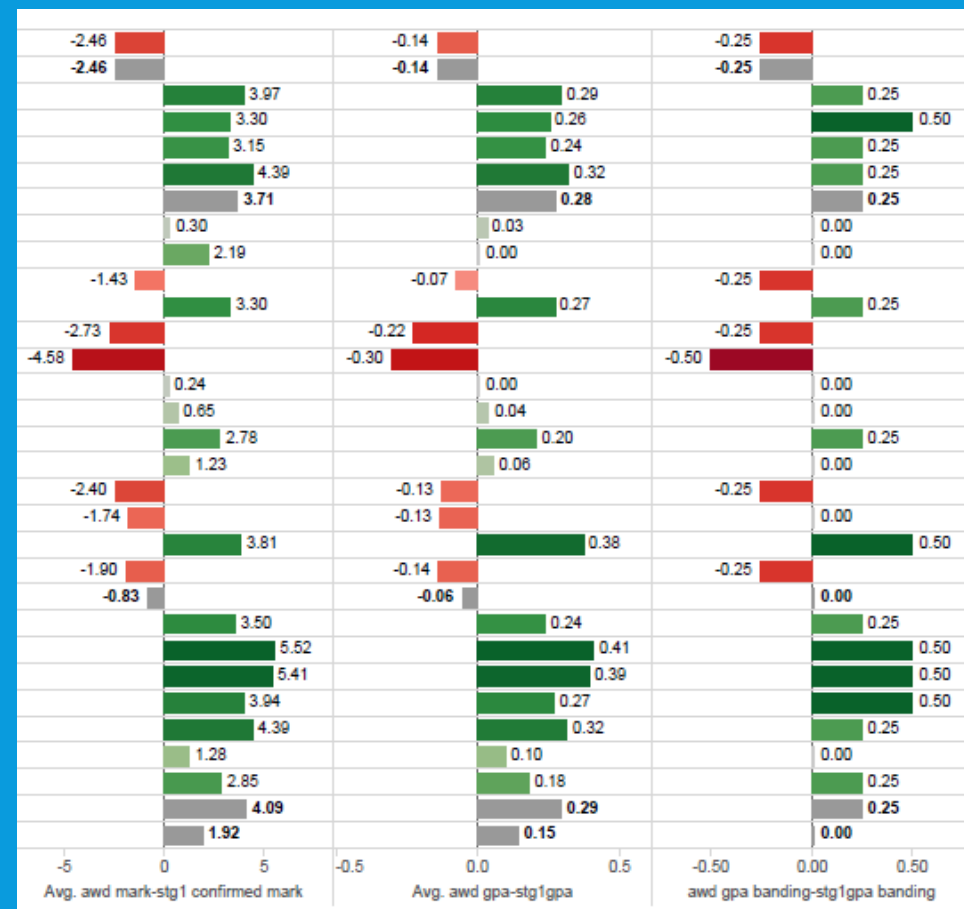
# FINDINGS AND QUESTIONS:

- **The modelling shows some surprising anomalies which are not shown when expressing students marks in the (traditional) Higher Degree Classification - this leads to some questions, including:**

- What are the possible explanations for the 'negative gain' shown in some schools? Assessment methods? Curriculum design and content? Marking cultures?

- What does expressing the marks as Grade Point Average (GPA) add?

- What is the impact of GPA banding as opposed to score?

- *Who looks at student learning gain/ achievement expressed in this way and which system is fairest to students and clearest to audience?*

# SELF-EFFICACY

Self-efficacy can be defined as students' confidence in their ability to accomplish specific tasks or attain specific goals

Typically, 4-5 questions per quiz and a follow-up confidence question.

- A quiz repeated at regular interval throughout a module

- Statistical analysis of individual/class confidence (data can be tracked back to individuals)

- Exemplar question from an Economics 1st year Module

Question: If a country's GDP and GDP per capita both grow at 2%, that means:
- A. That the country's population does not grow.
- B. That the country's population grows by 2%.
- C. That the country's population grows by 0.2%.
- D. None of the above is true.

- How do you feel about your answer?
  - very confident
  - confident
  - not confident
  - not at all confident

Question: I think that I can find the correct answers to these questions by myself, once I have time to review handouts and textbook, and study autonomously.
- A. Strongly agree.
- B. Agree.
- C. Disagree.
- D. Strongly disagree.

# FINDINGS AND QUESTIONS

- Quantitative data analysis (preliminary results) of the self-efficacy data indicate that:

- The pedagogy introduced allows students to develop good self-assessment skills

- Positive learning gain is associated to confidence gain. When students learn from each other in the classroom, their confidence at tackling similar problems in the future also increases.

# CONCEPT INVENTORIES

- Concept inventories are carefully researched tools in science disciplines (and exemplified by the most famous example in physics, the Force Concept Inventory)
- Concept inventories aim to assess student knowledge in ways that go beyond memorising of facts. They assess conceptual learning.



Galloway and Lancaster (2016), Learning Gains, in Education in Chemistry, Vol 26

# FINDINGS AND QUESTIONS

- Quantitative data analysis (regression analysis) of the concept inventory data indicates that:

- The smaller the rate of correct responses in the first quiz, the higher the learning gain in the second quiz.

- Therefore, the question this raises is what are the approaches that lead to enhanced student learning over the module. Also, why is learning gain inconsistent from student to student.

# WHAT NOW?

# NEXT STEPS

Add new cohorts to sample

Address questions raised with further analysis

Two further rounds of dissemination planned HEFCE Learning Gain conference (November 16 and HEA national conference July 17)

**Consider how project findings can impact internal and sector wide debates about measuring the quality of Higher Education**

| Aspect | Criteria<br>The extent to which… | Comments (to be reflected in Panel member guidance) |
|---|---|---|
| **Student Outcomes and Learning Gain** | Students achieve their educational and professional goals, including progression to further study or employment | Panel members will be looking for evidence that graduates are equipped with the sorts of knowledge, skills and attributes that allow them to progress successfully to further study or employment (particularly highly skilled employment).<br><br>Evidence is likely to include employment outcomes and progression to further study. |
| | Students acquire knowledge, skills and attributes that prepare them for their personal and professional lives | Panel members will be looking for evidence of broader educational and professional outcomes.<br><br>Evidence may include input measures such as employer engagement in the curriculum, course accreditation by professional regulatory or statutory bodies and extra-curricular activities designed to enhance employability and transferable skills. Evidence may also include the impact of using methods such as Grade Point Average (GPA) to record students' achievement. |
| | Positive outcomes are achieved for students from all backgrounds, in particular those from disadvantaged backgrounds or those who are at greater risk of not achieving positive outcomes | Panel members will be looking for evidence that the provider actively monitors and addresses differences between different groups of students in their development, attainment and progression.<br><br>Evidence may include approaches and interventions that have been shown to be effective at maximising outcomes for all students and tackling evidence of any differential outcomes. |

Q1: Do you agree with the criteria proposed in Figure 4? Please outline your reasons and suggest any alternatives or additions. Question 8 asks about the type of evidence that will be used to assess the criteria so please put forward your comments on the evidence base in response to that question.

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