Evaluation of HEFCE's Learning Gain Pilot Projects

Year 1 Report

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Introduction

1.1   This is the first annual report of the evaluation of the Higher Education Funding Council for England (HEFCE)'s Learning Gain pilot projects programme. Following a call for expressions of interest issued in March 2015, HEFCE awarded over £4 million to 13 pilot projects involving over 70 higher education institutions, with the aim of testing and evaluating measures of learning gain in England. HEFCE funding is for 1-3 years until 2018, although some projects will be extending their work using their own funding.

1.2   In addition to the pilot projects, a number of complementary activities support the learning gain programme. These include:

- The National Mixed Methodology Learning Gain Project, a HEFCE-administered multi-institutional longitudinal study combining a critical thinking and problem solving test with self-reflective questions exploring academic motivation, attitudes to literacy and diversity, and dimensions of student engagement;

- an assessment of the potential application of national datasets to learning gain issues, capacity building and networking events.

1.3   Information on learning gain was gathered in an independent scoping study carried out by RAND Europe[1]. Drawing on the RAND report, 'learning gain' is broadly considered by HEFCE to relate to the improvement in knowledge, skills, work-readiness and personal development made by students during their time spent in higher education.

1.4   The pilot projects use a range of methods to explore questions about learning gain, including:

- what different approaches could be used to measure learning gain;

- how robust and useful the data and other evidence arising from these approaches are, for example for supporting students and improving learning and teaching; and

- which methods and approaches have the potential to be scalable for use across the sector.

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[1] http://www.hefce.ac.uk/pubs/rereports/Year/2015/learninggain/

Evaluation approach

1.5   The aims of the evaluation are to:

   i.   Evaluate the success of the learning gain projects against the aims of the scheme.

   ii.   Evaluate the progress, outputs and outcomes of each pilot project funded against their individual aims and success criteria.

   iii.   Analyse the success, feasibility and challenges of the different methods and approaches for learning gain in England based on evidence gathered from the learning gain projects.

   iv.   Oversee the progress of the pilot projects to identify emerging themes and particular issues as they arise.

   v.   Identify knowledge gaps across the pilot project portfolio for which further investigation is required.

   vi.   Disseminate findings from the evaluation work amongst the learning gain projects and wider external audience.

   vii.   Use the outcomes of the evaluation to make recommendations to inform HEFCE's advice to Government on future learning gain policy.

1.6   Given the disparate nature of the projects, the evaluation operates at two primary levels. The first is against each project's unique success criteria and the second is against an overall Evaluation Framework. These two approaches operative iteratively, and will be reviewed after the Year 1 reporting cycle.

1.7   The Evaluation Framework has four key areas of focus: development of measures of learning gain; robustness and effectiveness; suitability; and scalability. Information on the individual projects can be found on HEFCE's website[2].

Approaches to measuring learning gain

2.1   The projects identify multiple approaches to thinking about and measuring learning gain, showing the complex territory of learning gain and the multiple perspectives on the purpose of higher education, what 'counts' as learning gain and what is being measured. Several projects consider learning gain broadly across students' lives, including trajectories into higher education and development of skills, knowledge and engagement for experiences beyond higher education. Across the projects there is a mix of generic and discipline-specific measures of learning gain. Some focus on particular aspects of learning gain, such as the effect of specific institutional initiatives towards engagement, work readiness or research experience.

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[2] http://www.hefce.ac.uk/lt/lg/

2.2   The multifaceted nature and purpose of higher education leads to a breadth of definitions of learning gain. Combining useful approaches from across the projects leads towards understanding **learning gain as a change in knowledge, skills, work-readiness and personal development, as well as enhancement of specific practices and outcomes in defined disciplinary and institutional contexts**.

2.3   Conceptual models help contextualise the definitions, offer a rationale for the approach and provide frameworks for measuring learning gain. Models that connect 'why' learning gain is being measured and 'how' it is being measured can also help clarify the relationship of the different elements being explored. Models include **affective**, **behavioural**, **cognitive**, **meta-cognitive**, **socio-communicative** and **civic components**. Different terms are used within these concepts across the projects and are being further explored in the on-going project evaluation. Model development and refinement is part of the process for developing and testing different measures of learning gain.

2.4   The projects fall into two types: 'Telescope projects' and 'Microscope projects'. 'Telescope projects' involve analysis of large amounts of data, and face the challenge of uncovering meaningful patterns, trends and areas for further investigation. These projects captured data from whole cohorts of students or conducted analyses of existing secondary data. These include measures and use of **learning analytics** and registration data. These can be very useful for uncovering patterns in progress and attainment across student groups or courses of study.

2.5   A challenge for 'telescope' projects is that when interesting findings are found, the data often indicates correlational relationships but does not explain **why**, thus requiring further qualitative analysis. Such approaches may be useful for programme and institutional improvement but may be less effective as a scalable, evaluative measure of learning gain. For example, data may show students' marks on a mid-term assessment drop, and this would be useful to explore in relation to the curriculum – though it would not necessarily be comparable with other subjects or institutions.

2.6   'Microscope projects' focus on collecting data from specific groups of students and, in several projects, tracking them over time. Methods include **tests**, **surveys** and **qualitative measures**. Most of these projects target students in specific subjects at different institutions. These projects have a specified area of inquiry, such as exploring the effect of work placements or study abroad; however, the challenge of these projects is gathering sufficient data to be generalisable across student characteristics, subjects and institution type.

Measures of learning gain

2.7 All of the projects involve a combination of input or entry measures; process measures (what students feel, think, do and know); and outcome measures, including grades, cognitive gain and employability. All of the projects combine newly collected data with secondary data analysis of existing institutional data, accounting for entry data, student demographics and characteristics, and student progress, continuation and attainment data (usually grades). Standardised **entry measures** are necessary to know students' 'starting points' to be able to assess what they subsequently gain through their time in higher education.

2.8 Drawing on psycho-social constructs, measures of learning gain can be categorised into three general types: **affective**, **behavioural** and **cognitive**. **Affective** measures, such as attitudes, interests and values, capture how students think and feel. Projects are exploring metrics of:

- self-efficacy;
- well-being;
- resilience;
- disposition to learning; and
- satisfaction.

These measures of students' attitudes and feelings can usefully be captured at numerous points in time to assess how students' emotional states vary during their higher education experience and how that might relate to their gains and outcomes in other areas. Several of these measures are also being used as outcome measures, such as increased self-efficacy or confidence.

2.9 **Behavioural** measures explore what students do and how they engage with their learning. Half of the projects are measuring student engagement through use of the UK Engagement Survey (or sections of it). Behavioural metrics include:

- student engagement;
- work placements;
- co-curricular activities;
- skills self-assessment;
- employability-enhancing experiences;
- study abroad;
- virtual-learning environment engagement; and
- learning analytics.

2.10   **Cognitive** measures capture students' intellectual gains, such as critical thinking and problem solving skills. Cognitive measures are used as both a process and outcome measure. Most projects use degree classification or grades as a measure of attainment and cognitive gain; additional measures include:

- grades;

- general cognitive gain (e.g. problem solving, quantitative reasoning, critical reading and evaluation);

- disciplinary cognitive gain;

- critical reasoning skills;

- situational judgement; and

- research methods.

2.11   All of the affective, behavioural and cognitive measures can be used as both process and **outcome indicators**. For example 'confidence' can be used as a process measure exploring the relationship between confidence and class participation, and as an outcome measure such as the impact of undertaking work experience on students' confidence.

2.12   Grades are the primary outcome measure being explored across most projects, including the use of Grade Point Averages (GPA). Additional outcome measures focus on students' **employability**, the development of knowledge and skills to be prepared to get a job and for the world of work, distinct from employment (getting a job). These include:

- career readiness;

- career adaptabilities;

- career sustainability;

- employability capital;

- employability; and

- level progression (between further education and higher education).

Methods and instruments

2.13   In the spirit of the design of the pilot projects, there is a range of methodological approaches. They can be classified into roughly four types:

- learner analytics;

- surveys;

- tests;
- multiple measures of a specific theme.

2.14 **Learner analytics** involves the collection, analysis and reporting of data about students and their educational environments. This largely involves secondary data analysis (analysing existing data) and maps onto the 'telescope' approach.

2.15 **Surveys** are used by a majority of projects and are linked with additional secondary institutional data. Survey items cover the breadth of affective, behavioural and employability measures. A number of projects are using items from the UK Engagement Survey. Other projects combine **surveys and tests** which both include questions drawn from existing instruments as well as newly developed items. There are a number of new cognitive tests being developed, as well as existing tests being trialled, fully or partially, in England. Cognitive tests tend to be quite expensive to develop or access, and can be challenging and time-consuming to complete.

2.16 The fourth approach involves **multiple measures of a specific theme**, including portfolios, interview and reflection data as well as surveys and additional secondary data analysis. Several projects include multiple work streams that adopt several approaches, and all of the projects are interviewing students and other stakeholders. The multiple measures help to validate the different approaches to measuring learning gain.

Robustness and effectiveness

3.1 Most projects got off to a slow start due to the timing of contracts and funding being transferred, hiring staff and managing partnerships and agreements. Once projects got under way a number had not anticipated the challenges of getting students to complete tests and surveys. Most projects managed to get sufficient data, but challenges of engaging students has broadly led to less data being generated from the first year of the projects than planned. In consequence, staff working on a number of projects amended their methodology by cutting the length of questionnaires, reducing data collection points, adding additional cohorts of students and broadening target samples.

3.2 In each project the validity and reliability of their measures is being examined. This includes exploring disciplinary bias, comparability of entry and exit measures, stakeholder understanding and reliability of student self-reported data. Several projects spent most of the first year developing new instruments to measure learning gain and testing the validity and reliability of the instruments and project design.

3.3 The projects are piloting different methodological approaches to measuring learning gain, which is reflected in the diversity of the projects' success criteria. Some are more conceptual; others focus on delivering a measurement or tested tool. Some

projects are deeply embedded in institutions and practices, others function more as an independent research project. Some produce data particularly useful for institutional enhancement or for measures of quality and accountability, while others focus on developing instruments so there is less confidence in the resulting data. It is important to remember to judge each project and its outcomes relative to its aims and goals, taking account of the context in which it was done.

Suitability

4.1   The feasibility of measuring learning gain has two main dimensions: practicality and value for money. One aspect is the ability of each project to successfully define and pilot a measure of learning gain. This involves setting up project teams, linking internal data systems, developing partnership arrangements, data sharing agreements and research ethics, and liaising with external survey, test and data providers. The second dimension of practicality relates to the project's ability to engage with students to complete surveys and tests and to get staff on board to help support this happening.

4.2   Getting students to complete surveys and tests was the biggest challenge from the first year of the projects. Compulsion has led to the greatest student engagement, for example when questions have been integrated with registration and enrolment. Most projects found liaising with front-line teaching staff was essential to getting students involved. Some projects targeted faculties or subjects with engaged staff, others worked within institutional governance structures or through teaching and learning networks to work with staff to encourage students to complete tests and surveys. Most projects offered students incentives, but experienced varying degrees of effectiveness. This signals the need to embed measuring learning gain in the standard administrative procedures or formal curriculum to ensure sufficient student engagement.

4.3   To explore how students and staff make sense of the instruments and measures, all projects are conducting discussion sessions or focus groups with stakeholders. Projects are also exploring how metrics can be used to improve teaching, enhance student learning and enrich the student experience. This information will feed into the on-going evaluation of the projects.

Scalability

5.1   The learning gain pilot projects require institutions to collaborate in new and different ways, particularly in developing and sharing student-level data. Three key, and interrelated, areas that present particular challenges have emerged: partnership agreements, data sharing and research ethics. A number of issues would need to be resolved for any measure of learning gain to be scaled up to include more institutions or to function at a national level.

5.2 **Partnership agreements.** Getting agreements arranged between the institutions took longer than many projects had anticipated. There were issues with data sharing, finances and legal clauses. How sensitive data could, and should, be shared across projects took a lot of negotiation. Several partner institutions raised concerns about the potential to create rankings when sharing and compiling data, particularly when the measures are still in the pilot phase.

5.3 **Data sharing.** The need to link individual student data with institutional datasets and share outputs raised numerous data sharing and data protection concerns. Given the large nature of the datasets, some projects have encountered data infrastructure challenges around sharing data. There have also been administrative data challenges in ensuring data is defined, encrypted and linked properly across institutional datasets, and matched across operating systems, for example from different virtual learning platforms.

5.4 **Research ethics.** Obtaining approval of research ethics has been another challenge. Some institutions did research ethics approval at the lead institution, which covered collection across all partners. Other institutions did separate ethical approval for each partner institution. Most secondary data analysis is covered under existing institutional data use agreements, but would not cover sharing the data with other institutions. There are additional ethical concerns raised by the projects, particularly in relation to learning analytics, such as weighing benefits of transparency, beneficence (doing good), and potential unintended maleficence (harm).

5.5 In addition to the practical aspects of scalability, the pilot work indicates that it is also important to consider whether measures are replicable and generalisable across disciplines, student groups and across different types of institution. Across a number of projects, subject-level differences are already emerging. This includes differences in scores and attainment patterns, as well as differences in how students interpret questions, for example how Humanities and Science students understand the application of research methods. Subject differences and general scalability will continue to be explored across the projects.

Uses of learning gain data

6.1 Although the projects are in the early stages, a number of examples have emerged of how learning gain data are being used to help support students and improve teaching and learning. Data has been used at a number of levels within institutions, but there are not yet examples of how it can be used across institutions.

6.2 **Personalised approaches.** Some projects have fed data into personal development tools for use by students, and some have provided students with personalised reports or dashboards on their learning and progress. The 'telescope' projects have used data to target students for personalised follow-up, such as offering one-to-one career

advice sessions. A number of projects share data with personal tutors who can follow up directly with students. Some projects have developed data that can be used to 'nudge' students towards behaviours linked with positive student outcomes, such as the association of hours spent in the library and degree outcomes, tailored to students' specific course.

6.3   **Pedagogy and curriculum design.** Data has been used to enhance the classroom learning experience. Some projects trialled and tested new pedagogical approaches in specific classroom settings. These were able to provide immediate feedback to students and offer outcome data of innovative practices to share within and beyond the institution. Data from the projects can provide tailored information to enhance programme design, for example a project found that programme leads and teaching staff have valued the opportunity to discuss and reflect upon how students are developing their understanding of research methods within their programmes of study.

6.4   **Institutional enhancement.** A number of the projects provide data that helps support services like Careers offices and Skills and Training units to tailor services and target specific at-risk or in-need students. Several institutions are using the data to promote the services offered by careers departments to their student bodies. Staff involved in projects have been able to develop institutional expertise and share their experiences of trialling measures of learning gain, and consider how this may support other institutional activities. For example, learning gain data was included in several institutions' Teaching Excellence Framework submissions and Office for Fair Access agreements.

6.5   **External engagement.** Through engaging with alumni by following up on their career trajectories, some institutions were able to reconnect graduates with the institution. One had such positive feedback from alumni that the work will be 'mainstreamed' as part of institutional activities. This helps with alumni fundraising, mentoring and careers, and placement support. Other projects plan to use data to motivate prospective students, linking student activities and engagement with employability outcomes.

Key considerations and continuing evaluation

7.1   From Year 1 there are lessons to be learnt about creating the conditions for success. These include getting the projects set up, running and embedded within institutions. Some projects have been clearer about what they wanted to measure and why, and subsequently had more engagement from students, staff, project partners and the wider sector. Getting projects embedded within institutions, and reaching front-line teaching staff and students, has been a key part of getting students engaged and for

developing the capacity for projects to support enhancements in teaching and learning.

7.2   **Student engagement.** The feasibility of getting students engaged was the greatest challenge emerging from Year 1. The projects' ability to collect data required engaging with students and staff to get students to complete surveys and tests, and to get staff on board to help support this happening. Projects that did this more successfully used the process of measuring learning gain and the data produced by the projects for enhancing teaching, learning and the student experience. To this end, the embeddedness of the projects in the core teaching and student support business of the institution is important. Evaluation of good practices in student engagement and retention in the projects will continue.

7.3   **Data sharing, data protection and research ethics.** Measuring learning gain raises moral, ethical and legal issues around data sharing, data protection and research ethics. These are not easily resolved, and need continued careful thought and debate across the sector. Many projects have raised concerns about how learning gain data could be used crudely to create league tables which ignore the complexities of the data and differences across student groups, subjects and institutions. Students are worried about how their data will be used, including how responses to learning gain tests and surveys could impact course marks or their lecturers' perceptions of them. There are also concerns about how the data could be used if linked with wider national datasets.

7.4   **Subject-level differences.** Learning is a complex phenomenon, and the multiple aspects of learning which students, institutions and other stakeholders are interested in means that there will be no 'silver bullet' or single measure of learning gain. The projects are developing and testing the robustness of different measures of multiple constructs and their use across different student groups, subjects and institutions. Subject-level differences are emerging across different projects, in terms of how students progress through higher education, how they respond to tests and surveys, and how they interpret questions on instruments.

7.5   **Entry measures**. The lack of standardised entry measures across the sector makes it challenging to compare across students, institutions and projects. On-going evaluation work will explore what measures are being used and how good practice can be shared across projects and with the sector.

7.6   **Measures of learning gain**. There are noted similarities of concepts and terms across the **affective**, **behavioural**, and **cognitive** measures used across projects. Evaluation work will capture more detail on what specific questions from instruments are being used and under what rationale different processes are being measured. This would provide greater clarity and synthesis across projects, and would also help develop a

greater understanding of what is being measured within constructs such as confidence, resilience and engagement.

7.7 **Outcome measures**. Similarly, evaluation work will continue to explore what is specifically being measured under the umbrella term 'employability' and related career outcomes including career adaptabilities, career readiness and career sustainability. How these relate to other outcome measures, including grades and attainment, will be explored in on-going evaluation of the projects.

7.8 **Conceptual models**. Evaluation work will also explore projects' developing conceptual models of how different **affective**, **behavioural**, and **cognitive** measures relate and are being used as process and outcome indicators.

7.9 **Stakeholder views**. Staff working on projects have been encouraged to seek views of students, academics and other stakeholders on measuring learning gain. This includes feedback on instruments, the intensity of time and effort required and the usefulness of the outcomes, and will feed into evaluation of the suitability of different measures and approaches.

7.10 Project evaluation reporting schedule:

- Year 2 Interim report: May 2017;
- Year 2 Report: January 2018;
- Year 3 May 2018;
- Final Report: January 2019 (to be confirmed).