

INTRODUCING THE YORK PEDAGOGY

The York Pedagogy: What and why, how and why

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In December 2014, as part of its strategy for 2015 to 2020, the University of York decided that all its programmes would comply with a distinctive York pedagogy by 2017-2018. In this article I survey the York pedagogy from the vantage point of September 2015, a crucial moment. The academic year 2014-2015 was preparatory: students and staff in academic departments and support directorates took part in pilots and trials; University Teaching Committee and its strategy subgroup discussed and agreed enabling processes and documents. After the year of preparation comes the pivotal year of implementation. In 2015-2016 the pedagogy will be introduced across the University.

I will describe the pedagogy and explain why the University has adopted

it, then outline the implementation plan at university, programme and module levels, with examples and reasons. The article's what-and-why, how-and-why structure mirrors the pedagogy's framing of outcomes (what our programmes of learning enable graduates to do), work (how their activities as students gets them there), and explanations (why, applied to both what and how).

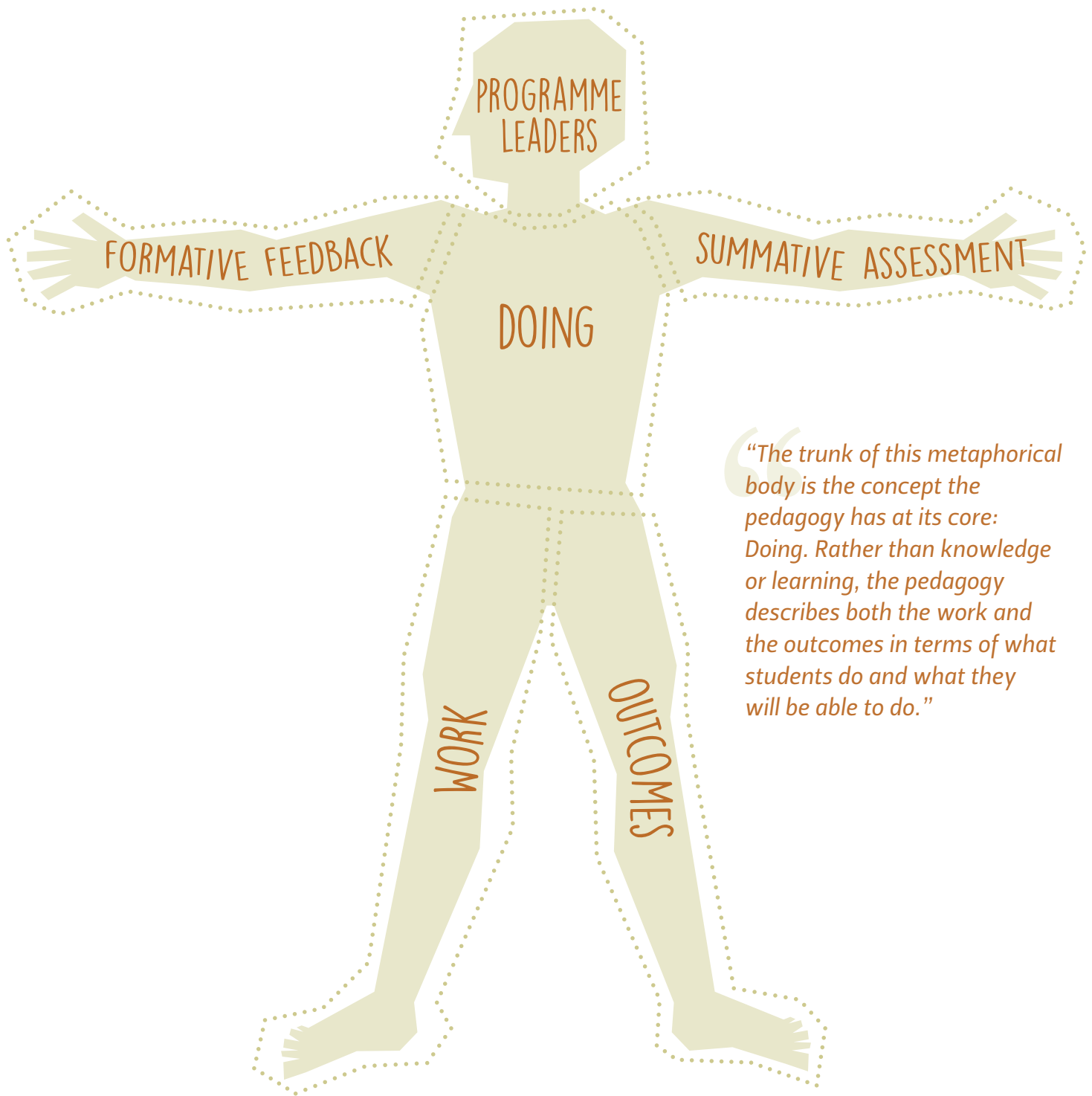
What is the York Pedagogy?

Key Objective 2 of the University of York Strategy 2015-2020 is "To offer outstanding teaching and learning". York has a strong tradition of excellence in teaching so the first imperative is to keep going: the outstanding individuals who teach and support learning, the methods

and ways of doing things that work well, the excellent resources – all should be maintained, supported, celebrated and developed. But the University Strategy also has the ambition to improve students' education through the "York pedagogy" of work-centred programme design. Sidebar 1 reproduces the formal description of the pedagogy from the Learning and Teaching Strategy.

There are at least three ways to summarise the pedagogy less formally (four, if you count the super-concise summary in this article's title). The first identifies the pedagogy's parts and highlights a distinctive feature. The second captures ambition via the pedagogy's most useful metaphor and the third uses questions for a brisk, pointed, checklist.





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INFORMAL SUMMARY 1: The limbs and the trunk

Outcomes and work are the legs of the pedagogy. Its right arm is academics and teachers acting to propel students' work through contact and formative feedback. Its left arm is the summative assessments that assure and evaluate progress¹. The pedagogy's head is the programme leaders, who, with the assistance of all who teach, are the designers who shape what students experience in their learning.

Those five limbs (counting head as a

limb!) provide a five-part structure to the pedagogy project plans, guidance documents, and programme leaders course; each expresses a theme and principle (see sidebar 2). The trunk of this metaphorical body is the concept the pedagogy has at its core: *Doing*. Rather than knowledge or learning, the pedagogy describes both the work and the outcomes in terms of what students do and what they will be able to do.

Emphasising *Doing* to learn embraces not only the ancient truth that doing beats seeing and hearing, but also

contemporary research, discussed in the section *Why has the University adopted the pedagogy?* below.

Emphasising *Ability to Do* for outcomes is a deliberate choice against emphasis on *Being*. Some universities make claims about what their graduates *are* (eg mature learners and thinkers, team players, leaders). Others mix up being and doing². The York pedagogy says what graduates are *able to do*, acknowledging graduates' autonomy, and allowing explanation of how the programme delivers the outcome. For

The York pedagogy as described in the Learning and Teaching Strategy 2015-2020

- We will articulate a University of York pedagogy and apply it to all our programmes.
- We will apply the best evidence on effective teaching and learning to define our institution's learning culture and set expectations for our programmes.
- We will put programme design and student work at the heart of our pedagogy.
- Every programme will have distinctive and clear objectives, and each stage of study will be designed to offer progress towards those programme objectives.
 - Carefully-designed student work will enable students to make progress. Students will understand the work they are expected to do and how that work will contribute to the achievement of the programme objectives.
 - Interactions between students and staff will be designed to encourage, inform and propel students' work. Students will receive the guidance, support and feedback they need to make progress, and they will understand what they can expect from the University in support of their learning.

The pedagogy is a distinctive York perspective summarised in section 1 of key objective 2 of the University Strategy thus:

The design of programmes and student work will support the students' development as autonomous learners.

All new programmes will be designed in accordance with our pedagogy. By 2017-18, all programmes in the University will comply with the principles of the University pedagogy.

Central to the pedagogy is the design of student work, that is, the totality of activity students do, inside and outside contact time, in order to learn. Carefully designed student work will engage and challenge our students by drawing directly on activities known to enhance learning, for example spaced and interleaved practice, retrieval of previously-learned material in new contexts, collaboration, and development of transferable skills. Because the effectiveness of student private study is correlated with learning gain, highly variable between students, and often capable of significant improvement even for the best students, our programmes will demonstrate an explicit understanding of how students spend their study time and an explanation of how this work is designed to lead students to fulfill the programme learning outcomes.

We will prioritise the careful, collaborative design of a small number of concise, stretching yet achievable learning outcomes for each programme.

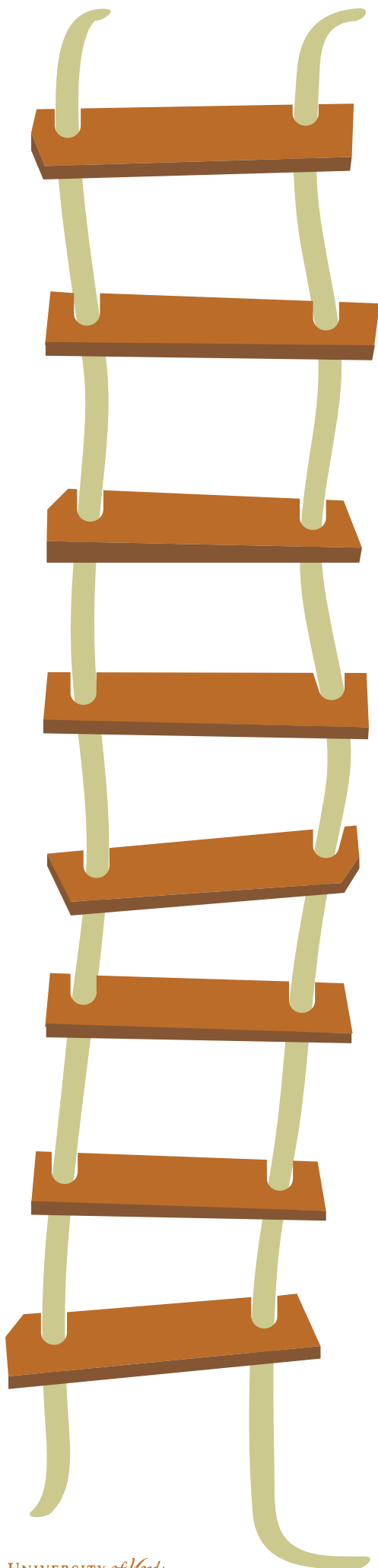
These will capture the distinctive characteristics of the programme and its graduates, which can be easily communicated to inspire and inform our applicants and students. We will explain how the outcomes are achieved progressively over the course of the programme through student work, teaching, assessment and feedback. This will enable students to understand the coherence of their programme, their stage of development within it, the relevance of modes of teaching, learning and assessment, and the transferability of skills and knowledge to new situations including those encountered in placements or employment. The programme learning outcomes will be developed and owned by the academics offering the programme, reflect scholarship in the subject matter and, where appropriate, PSRB

(Professional, Statutory and Regulatory Body) requirements. They will embed the values in this Strategy of the pursuit of knowledge, enhancing students' choices and developing human capability. We will provide guidance and support to departments in designing and reviewing programme learning outcomes.

Contact time with staff, whether face-to-face or virtual, synchronous or asynchronous, will inspire and engage students. The creativity, enthusiasm and clarity of York's staff will continue to be central to providing appropriate and challenging content (for example in lectures), developing insight through structured, interactive discussion (seminars) and practical work (labs), and providing students with timely advice on work in progress. All types of staff-student contact will guide and support students towards optimal use of all their study time for productive learning. There will be a complementary expectation on students to engage with contact events and show commitment to their studies.

Assessment and feedback will be coordinated at programme level, to ensure that the nature, pattern and volume of assessment and feedback within individual modules supports progressive development towards programme learning outcomes, provides timely and useful formative work in an efficient way, and avoids excessive volumes of summative assessment, which creates unnecessary pressure for both students and staff.





example, compared to the statement in the previous strategy, “York graduates are lifelong learners” the most the pedagogy would claim is learning abilities that, if applied, will be effective throughout life. But the expression of those abilities will be precise and credible, in a programme-specific learning outcome. Attached to the outcome will be the strand of learning that leads to it – the explanation of how the students’ experience throughout the programme grows the abilities.

INFORMAL SUMMARY 2: **The learning ladder**

The second informal summary of the pedagogy further develops the idea of a strong final outcome at the top of a programme, with a strand of learning leading to it.

In the York pedagogy a programme’s primary description is its learning outcomes. Some outcomes express learning abilities like critical thinking, writing, speaking and teamwork in ways that are relevant to the discipline; others capture the more specific expertise needed to navigate the subject matter. The size of the description – six to eight outcomes – is itself a careful choice, to ensure aspiration is made concrete.

The growth of the learning ability encapsulated in the programme learning outcome is a strand that extends down from the top, and twines with other abilities to form the ropes of a learning ladder. The rungs of the ladder are progression points at the ends of blocks of learning: For undergraduate degrees there may be six or eight rungs and for postgraduate taught, two or three. To plan the ascent is to specify the intermediate expectations at each progression point and explain how the climb from the current rung to the next gets students closer to the abilities of a graduate.

The rope ladder metaphor emphasises the continual ascent through learning abilities. It threads the ropes of the learning ladder through the programme’s content. The design of the structure, content and assessment of the programme should ensure that the activity at each stage is mindful of the graduate endpoints and boosts the student towards them.

In a programme with great freedom of choice, corresponding perhaps to a Department’s breadth of research interest, the thing that all students will have in common at a particular level (the end of second year, for example),

will not be their specific knowledge, but the stage of development of their learning abilities: they will all be at the same elevation on their ascent. This location can also be identified in combined degrees. Paths of learning split and merge so parallel modules should offer parallel steps towards the programme learning outcomes.

Expressing and then improving the learning ladder is a large part of the York pedagogy. The work that students do at module level, the way that it is assessed and the contact time with staff have to be represented in the context of the entire programme. A programme map is needed, to reveal coherence or incoherence, clarity or vagueness, and provide a framework for progressive improvement. Such a map is described later in the sections on implementation.

Learning equips work to achieve more in the same amount of time. This second summary of the pedagogy, with its image of outcomes at the top of a learning ladder, connects work and achievement in strands. Looking along strands as an ability develops or across strands as different abilities grow together reveals whether later work is getting as much benefit from earlier learning as possible. Could a more quickly grown skill be exploited to accelerate later learning?

York’s ambition is for graduates who are better fit for employment, better equipped for further study and research, better able to seize opportunities, better prepared for the risks and obstacles of life. Having just a few powerful programme learning outcomes, each at the head of a strand of learning, allows the co-design of outcomes and work, stretching the strands so the outcomes can be raised.

INFORMAL SUMMARY 3: **The pedagogy as questions**

The third informal summary sees the pedagogy as a framework of questions that creates and challenges explanations. The questions are to be asked and answered at both programme and module level. The second question in each pair asks for an explanation of the first question’s answer, but implicitly it is also asking “Is there a better way?”

- 1.1 What will students be able to do when they’ve finished this that they weren’t able to do before?
- 1.2 Why has that ability been chosen as the outcome? (At programme level)

this includes, why is it important to graduates of the subject and is it ambitious enough. At module level it includes, how does it contribute towards the programme learning outcomes and is it giving as much as it could.)

- 2.1 How do the assessments test the outcome?
- 2.2 Why have those assessments been chosen as the test?
- 3.1 What activities/work do students do to grow their abilities to the outcome?
- 3.2 Why have those activities/work been chosen over any others?
- 4.1 How do the contact events and formative advice propel and support the work?
- 4.2 Why are these the best contact events and ways of giving feedback?

What the York pedagogy isn't

As a framework for programme design and interpretation, the pedagogy dictates neither what a programme's outcomes should be nor the work asked of students. It simply says how these things should be expressed, connected and explained. If good explanations aren't possible, the programme should change. Even when there are good explanations, things can be made better and the pedagogy gives a way of identifying and tracking improvements.

The pedagogy does not say to use essays, exams or any other means of evaluation, but that summative assessment should serve the programme. It doesn't say to use lectures, tutorials, flipped classrooms, labs, problem-based learning, online forums, seminars, or any other mode of teaching and learning. It simply asks why a module's teaching methods are appropriate. An extensive kit of instruments is available. The pedagogy doesn't force teachers to stretch for an unfamiliar tool, but it doesn't let them forget the possibilities.

Why has York adopted the pedagogy?

The York pedagogy has been shaped by a review of what York is good at and an assessment of robust research in higher education learning, but it starts from two straightforward facts: Degrees from English universities, both undergraduate and postgraduate, are awarded after fewer hours of study than degrees elsewhere³; and in almost all

“...for students to get maximum benefit from their education, design of their non-contact study should be at the heart of learning and teaching”

programmes, students are expected to do more of their study outside contact hours than in⁴.

The Strategy's claim (see Sidebar 1) that “the effectiveness of student private study is correlated with learning gain, highly variable between students, and often capable of significant improvement even for the best students” is supported by North American and European research^{5,6,7,8,9,10}. So the strategy infers that for students to get maximum benefit from their education, design of their non-contact study should be

at the heart of learning and teaching. Student work will continue to involve familiar activities like reading, analysing, practising, problem solving, critiquing, designing, experimenting, writing and speaking, but *designed* so the totality of study time is as productive for learning as possible. Design includes calibrating work to students' level, making use of what earlier learning has enabled them to do, and it calls on all the things that research shows enhance learning. (See the book by Brown *et al*¹¹ for a good presentation of evidence in support of the strategy's examples of “... spaced and interleaved practice, retrieval of previously-assimilated material, collaboration and the development of transferable skills” and others like structure building, which is constructing a coherent mental framework by extracting salient ideas.)

SIDEBAR 2

The principles of the York Pedagogy

1. Programme leadership

Implementing the York pedagogy requires a clear framework of programme leadership and team-working, for example to ensure that the design and assessment of individual modules makes the most effective contribution to learning in the context of the particular programme. Currently, practice varies considerably around the University – regarding both the ways of working and the use of terminology such as ‘programme leader’. As part of the wider Learning and Teaching Strategy, we will be exploring a consistent set of terminology and definitions for these roles. The role of programme leader is vital to drive the implementation of the pedagogy.

2. Programme Learning Outcomes

The York pedagogy requires fresh thinking to capture the distinctive characteristics of each programme in a set of 6-8 programme learning outcomes (PLOs). These powerful programme learning outcomes are achieved progressively through principles 3, 4 and 5.

3. Summative assessment

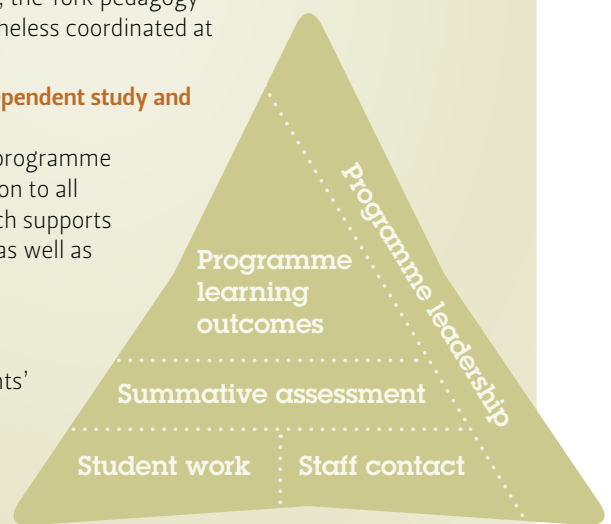
Summative assessment remains located within individual modules. However, the York pedagogy requires that they are nevertheless coordinated at programme level.

4. Designing student work: independent study and formative work

The York pedagogy requires programme design to give explicit attention to all aspects of student work which supports learning, independent study as well as contact with teaching staff.

5. Designing contact with staff

The York pedagogy seeks to maximise the value of students' ‘contact time’ with staff (which may be face-to-face, virtual, synchronous or asynchronous).



Putting student work at the centre means contact events serve the work. They are designed to start, propel, accelerate, consolidate, correct, steer and encourage students in doing the work through which they learn. They are likely to include lightweight ways of giving feedback on work. Research shows how valuable “close-contact” personal interaction is^{12,13} but this has to be done within limited resources. Some lightweight methods have been explored in the literature^{14,15}, and it is also possible to exploit structured asynchronous discussions as in many of our Distance

Learning programmes and using techniques such as “Write to Learn”¹⁶.

The other leg of the York pedagogy, a programme-level focus and the use of clear overall learning outcomes, is motivated by research showing that programmes characterised by a fragmented focus on individual modules have low average marks¹⁷. High-performing programmes are supported by ‘communities of practice’ in continuing discussion of how to make entire programmes work well for students¹⁸.

Tactical considerations also push towards programme-wide learning design. The National Student Survey (NSS) and Postgraduate Taught Experience Survey (PTES) measure student satisfaction with whole programmes. The Teaching Excellence Framework (TEF) will probably go down to subject level and therefore to programmes¹⁹. Other universities in the UK and overseas are “retreating from modularity”²⁰ as they adapt pragmatically to these forces.

So it is for both strategic and tactical reasons that the York pedagogy will apply to all York programmes. Some already reflect its principles. For those, the pedagogy’s lens will resolve a clearer explanation of why particular outcomes have been chosen (eg why those abilities are vital in the discipline) and why students do the particular schedule of work. Other existing programmes may be further away from the pedagogy. Perhaps they specify modules mainly by knowledge content, and relate modules to each other in terms of pre-requisites. While the pedagogy’s perspective may at first seem unusual, it will reveal how student work fulfils the key aims and outcomes and will add another dimension to everyone’s understanding of the programme.

How will the York pedagogy be implemented?

2015-16 is the pivotal year in implementation of the strategy, as Sidebar 3 shows. The key policies, processes, documents and mechanisms of support have been decided over summer 2015, based on analysis of the pilots and other work done in 2014-15. Now comes implementation.

The University’s current programme specifications have long lists of learning outcomes that are not easily communicated to staff, students or applicants. Current module specifications list topics, contact events, assessments and other information, but are certainly not structured around student work. No

documents connect module outcomes to programme outcomes in a way that could be used to design improvement in both. Transition to the pedagogy is a big task.

To achieve something so ambitious requires actions that are distributed, coordinated, as simple and as engaging as possible. The rollout plan relies on “massively parallel” effort, distributing similar small tasks to many people, then identifying and equipping programme leaders to coordinate and consolidate that work. It introduces minimalist tools that as simply as possible document and reveal outcomes, work and explanations, and it structures activities so they engage the university as a community of creative people.

In the remainder of this section I will outline the six types of action that will be taken to realise the pedagogy, explaining why each one is an important part of the route to implementation. Then I will illustrate how realisation of the pedagogy will work in practice with fictitious examples. Finally I will return to explanation, to say why the key design tool of the pedagogy looks the way it does.

Engaging and sharing with the whole university

The only feasible way to move all programmes to the York pedagogy is to engage widespread help. The whole community must be informed so everyone is aware why programme-level outcomes and student work are shaping the way we teach. Those who teach on modules will be enlisted to contribute to the most detailed part of the process: they will describe and explain work and outcomes at the module level, in a small number of sentences.

Identifying, developing and enabling programme leaders

Although all staff who teach participate in the design of learning and teaching, for every programme of study there should be someone whose concern is the programme as a whole as experienced by students. That person is the programme leader. Because the York pedagogy gives the right and responsibility for describing the graduates of a programme to those who design and deliver it, the programme leader will initiate and steer discussion about programme learning outcomes to a conclusion. They will do the coordination and critical review of the way modules contribute to the programme. From 2015 to 2017, most activity will be transition,

SIDEBAR 3

History and roll-out of the York pedagogy

2013-14: Formulation and consultation on the principles and emphases of the pedagogy. Integration in the University Strategy and agreement.

2014-15: Creation of central project team *ProPEL* (Programmes to propel effective learning) based in the Academic Support Office. Pilot projects reviewing existing programmes according to the principles of the pedagogy (drawing on the TESTA methodology); development of policy, documents and supporting tools.

2015-16: Implementation framework in place; all departments enabled to put undergraduate programmes into the framework, with most programmes done. Creation of documentation according to the pedagogy so that future modification can be considered in terms of the pedagogy’s themes. The act of preparing documents will catalyse discussions and opportunities for incremental improvement. New programmes will be designed according to the pedagogy.

2016-17: Completion of the application of the York pedagogy principles and framework through all undergraduate programmes. Application of the pedagogy to all PGT programmes.

2017-18: Framework in use and guiding design of modifications and new programmes. Pedagogy used in marketing.



SIDEBAR 4

A Six-Step Process for Designing Programme Learning Outcomes and the Programme Map

1. The programme leader does a first approximate draft of the outcomes capturing their view of what is important about the programme guided by prompts from supporting documents and the ProPEL project team.
2. The draft outcomes are revised and refined in discussion with the wider programme team.
3. The programme leader completes a first approximate draft of the programme map, writing in the draft outcomes and using available documents about the modules in the programme to “rough-in” the contributions of each.
4. The programme leader discusses each module with its leader. The draft map is extensively modified as it becomes clear what really goes on in the modules.
5. The programme team collectively revises the programme map and may revise the programme learning outcomes too.
6. The programme learning outcomes and the programme map are signed off by the programme team and Board of Studies.

so every existing programme needs a leader, though one person can lead more than one programme.

In 2015-16 programme leaders will be formally identified and supported with training, guidance and advice. Although the role of programme leader has been heavily trailed since Autumn 2014, the responsibilities were not clearly identified until after the pilots, so in 2015-16 the help of chairs of boards of studies, chairs of teaching committee will be important as programme leaders find their feet. In the longer term other office holders will continue to be influential and involved but programme leaders will be central to realising the pedagogy.

Writing powerful programme learning outcomes

Perhaps the most crucial activity will be writing programme learning outcomes. The pedagogy moves them to the core of teaching design. Under the leadership of the programme leader, formulation of the outcomes will be a collegial and intellectually engaging process.

Preparing programme maps

The programme map is a document that captures compactly how the programme is consistent with the pedagogy. It is primarily a design tool, but to move to the pedagogy it must first be created. The map will describe work and progress within modules, so every module leader and probably everyone doing teaching will contribute. Programme leaders will liaise with module leaders, students and others such as the department’s Industrial Advisory Board. Programme leaders will oversee the representation of student work and later use it to ask questions: Are these tasks getting maximum benefit from earlier learning? Is it appropriate to practice or develop an existing skill in this context or that? Why are these things going on at the same time?

At each point of a perfect programme the map will provide a clear answer to the question, “Why are we doing what we’re doing now?” The answer will be specific, and demonstrate that the choice of work fits into a coherent design that is a rationally planned route up the learning ladder. (Of course, it is appropriate to admit that learning design is hard and that the work may be revised as we explore better ways to the same ends.) The map

will show students clearly that what they are doing is not because of tradition, habit, fad or accident, but because the programme has been designed as a whole to use their work as powerfully as possible to meet the programme learning outcomes. In practice, maps will also reveal places where it is not possible to make such arguments and therefore provide a programme-centred blueprint for change.

I discuss the programme map later, giving a fictitious example and explaining its design. It is the key medium for starting and maintaining many parallel activities and conversations.

Linking the programme learning outcomes and the programme map to formal specification documents.

The ProPEL team (see Sidebar 3) are continuing work on new Programme Specifications during early 2015-16. Both programmes and modules in the forthcoming Programme and Module Catalogue will link to the programme map and embed the pedagogy’s expectations. Once the catalogue is complete, a single set of interconnected documents will provide for design, regulatory oversight, and information for students.

Using the programme map for continual improvement

After its initial careful creation, the programme map will be used regularly and progressively to identify and seize possibilities for improvement. Programme-level change will reshape the map but, probably much more frequently, localised modifications



Programme learning outcomes (PLOs) of three fictional degrees

Simulated first draft of programme learning outcomes for a fictitious combined honours programme in Chemistry and Sociology

Graduates will be able to:

1. apply the theoretical and empirical methods of both chemistry and sociology to questions at the frontier of knowledge, by choosing and combining insights from both disciplines.
2. explain, debate and demonstrate to lay audiences the application of both sociology and chemistry to problems of international importance.
3. build teams that work collaboratively and make progress efficiently towards solutions by identifying the complementary expertise required alongside chemistry and sociology for real-world projects.
4. perform with great facility the characteristic skills of both chemists and sociologists.
5. probe the sociological implication of state-of-the-art scientific development in at least one area of chemistry using at least one particular and sophisticated method of social analysis.
6. evaluate and explain the potential impacts, including risks, of large-scale engineering projects from both physical science and social science perspectives, and thereby produce recommendations for sustainable development.

Simulated first draft of programme learning outcomes for a fictitious combined honours programme in Art History and Computer Science

Graduates will be able to:

1. read, understand, contextualise and apply research in both art history and computer science.
2. interpret trends in information technology invention and application from an art historical stance and explain these in terms understandable to both kinds of specialist.
3. suggest, develop and demonstrate computer engineering solutions to problems of artifact analysis, display and interpretation.
4. contribute immediately and effectively to interdisciplinary teams in industry, consultancy or education, identifying relevant insights from both art history and computer science to the problems at hand, explaining these to other team members.
5. manage themselves, teams and processes in preparation for technical careers in computer science or curatorial and critical careers in art history.
6. design, prototype and test software systems to meet specifications.
7. analyse and interpret works of art to expert and lay audiences.

Simulated first draft of programme learning outcomes for a fictitious combined honours programme in Economics and Archaeology

Graduates will be able to:

1. apply sophisticated economic models of human activity to the description of human societies of all kinds and ages, and in particular to the interpretation of archaeological evidence.
2. fulfil the role of both economist and archaeologist in an interdisciplinary team, whether addressing contemporary problems or working towards deeper understanding of the development of civilisation, with particular strength in synthesising ideas between disciplines.
3. acquire and analyse new archaeological data, then interpret it in context and with relation to other historical information.
4. acquire and analyse new data on economic behaviour, then calculate, simulate and evaluate impacts on small and large economic units.
5. engage critically with new theory and results offered by experts in both economics and archaeology, using the methods and norms of each to debate, interpret and explain implications to non-expert audiences.

will capture the impact of colleagues improving their modules.

Implementation in practice: First approximations

Two written descriptions are the central design tools of the York pedagogy. The first is the statement of programme learning outcomes. The second is the programme map that compactly reveals how students reach those outcomes.

The ProPEL team have prepared supporting materials and will work with programme leaders to guide these tasks, but I want to outline here how this work can get started. I will illustrate the written descriptions and some steps in producing them. Following the examples I will explain

why the programme map and the steps in producing it are designed as they are.

Sidebar 4 shows a six-step process for designing programme learning outcomes and the programme map.

At the end of the process and signoff, the map will be accurate diagnostically and the programme leader can begin to use it for design. It will be a living document, changing more frequently than the programme learning outcomes as it shapes improvement and reflects bottom-up change.

Steps 1 and 3 in Sidebar 4 are approximate and done by the programme leader. They are bootstrapping steps whose purpose is as much to get conversations started as to provide

an initial view. In that context, I offer illustrative fictitious examples.

To get within eyeshot of reality, but hoping to minimise the offence of trampling across disciplines with a flat-footed understanding of what matters, I have imagined new combined programmes between widely-separated subject areas. I think the University will never offer these programmes. But still, I am doing a little trampling. In no case am I from either of two contributing disciplines, so these are almost certain not to be the outcomes that would be devised by disciplinary experts. I hope colleagues will forgive. It's just for illustration.

Sidebar 5 shows programme learning outcomes for each of three fictional

SIDEBAR 6: Simulated first draft for a programme map for a fictitious combined honours programme in Economics and Archaeology

YEAR/ TERM	MODULE	PLO1: DESCRIBE HUMAN SOCIETIES IN ECONOMIC TERMS	PLO2: BRIDGE DISCIPLINES IN PROBLEM-SOLVING TEAM	PLO3: ACQUIRE AND EXPLAIN ARCHAEOLOGICAL DATA	PLO4: ACQUIRE AND APPLY ECONOMIC DATA	PLO5: CRITIQUE, DEBATE, EXPLAIN
1/1	Economics 1	By practising written, numerical and graphical work, students will begin to use the fundamental tools of economic analysis and description. By hearing, noting, then expressing in their own words the relationship of theory and practice in economics, students will understand the core structure of economic argument.			By working with real data, students will begin to see the strengths and limitations of economic data sources.	By doing critical assessment of real economic problems, students will begin to appreciate the demands of rigour and tests for plausibility in theory.
1/1	Maths 1	By practising mathematical techniques, and especially constrained optimisation, students' familiarity with the fundamental tools of economic analysis will deepen. Their facility with standard maths working will be enhanced.				
1/1	Prehistory to present	By reading about the major chronological phases of world archaeology, students will understand the broad context within which an economic interpretation is one perspective.		By repeatedly encountering the various kinds of archaeological evidence and what can be inferred from particular examples, students will develop an appreciation of the range of types of archaeological data.		By developing a reasoned argument in the central essay, students will begin to practice the expressive capability for clear and cogent argument.
1/1	Accessing Archaeology		By preparing seminar presentations in teams, students will begin to encounter group working applied to focused problems in the discipline.	By reading and discussion on the characteristics of archaeological data, its methods of study, students will more broadly understand the range of issues in analysis and interpretation of archaeology.		
1/2	Probability 1	By working through examples in probabilistic analysis, students will get further practice in mathematical skills, moving them towards greater facility with maths in general, and will acquire the foundation knowledge for their subsequent work in statistics.				

1/2	Statistics 1	By memorising the meanings of foundational statistical concepts, then repeated practice on examples, students will develop skills in applying correlation and regression to real data.	By preparing plans for projects students will understand and practice organisational skills that are generally applicable to team working.	By practical experience in reconnaissance, survey and evaluation of archaeological sites, students will assimilate the major practices of field data acquisition.	By practising with statistical tests, students will assimilate constraints in sample sizes, and begin to understand the possibilities for controlled experiments and interpretation of observational data.	By practising fundamental statistical analysis on real examples, students will recognise the role of statistical tests in critiquing naïve inferences from data. By practising the presentation of statistical results, students will gain facility in expressing analyses clearly.
1/2	Field archaeology		By collaborative working at the dig and in preparation for the exhibition, students will better understand how teamwork can be made effective in different contexts.	By practising field archaeology on a working site, students will better understand the issues in acquisition of new data. Systematic and meticulous skills will be developed.		By presenting results in the exhibition and practising skills of explanation and, where appropriate, the presentation of contrasting viewpoints, students will strengthen their ability to summarise and compare arguments.
1/3	Excavation					
2/1	Economics 2: Micro	By memorising appropriate fundamentals in microeconomics, practising examples in microeconomic analysis, and practice in applying micro methods to policy questions, students will broaden their toolkit of analytic skills and assimilate how to gain further knowledge in micro techniques.				
2/1	Economics 2: Macro	By practice in using theory to explain current and past macroeconomic problems, students will develop proficiency with the analytic and explanatory tools of macroeconomics.			By engaging with examples in financial markets, households, firms, policy makers, the EMU, students will deepen their understanding of the character and constraints of economic data sources and the appropriate types of analysis.	By writing practice essays in preparation for the requirement for written arguments in sections B and C of the exam students will develop their skills in written argumentation.
2/1	Historical archaeology	By reading and discussion of topics within particular historical periods, students will deepen their understanding of ways of describing societies.	By considering historical periods from several perspectives, students will gain in appreciation of the ways that different disciplines can be integrated towards enhanced understanding.			By preparing and presenting two seminars students will develop skills in clear, ordered oral presentation. By formative work leading towards the final summative essay, students will hone their writing.

12 INTRODUCING THE YORK PEDAGOGY

YEAR/ TERM	MODULE	PLO1: DESCRIBE HUMAN SOCIETIES IN ECONOMIC TERMS	PLO2: BRIDGE DISCIPLINES IN PROBLEM-SOLVING TEAM	PLO3: ACQUIRE AND EXPLAIN ARCHAEOLOGICAL DATA	PLO4: ACQUIRE AND APPLY ECONOMIC DATA	PLO5: CRITIQUE, DEBATE, EXPLAIN
2/1	World archaeology	By focusing on archaeological questions in a particular part of the world, students will read, discuss and prepare written commentary on archaeological questions and methods that are at the forefront of the discipline.				
2/2	Econometrics 2	By exercising again the statistical skills developed in Statistics and then extending these to more sophisticated, models, estimators and tests, students will gain facility with the core tools of econometric analysis.			By use of PcGive econometric software and working on practical examples, students will further understand the scope of analysis and the extent to which data can be interpreted for decision making.	By appropriate memorisation, practice and working with real-world examples students will establish the level of understanding necessary to read, understand and evaluate applied economics articles. By working on the module project students will further develop their skills in presenting and integrating written and numerical arguments.
2/2	History and theory		By working in teams to produce seminar output, on material that is diverse in theoretical stance, students will grow in their ability to harness others' complementary expertise and contrasting perspective.	By considering and debating the ways that different theories of archaeology have influenced the interpretation of data, students will develop a rounded understanding of the implications of choices in data analysis.		By comparison of the different conclusions arrived at on data depending on theoretical approach, students will develop skill in discerning where interpretation rests on assumption, uncovering unvoiced presuppositions and making clear in their own writing the dependencies between theory and practice.
2/2	Introduction to Archaeological science	By reading and hearing about scientific methods in archaeology and seeing them practised in case studies, students understanding of the range of archaeological perspectives will broaden.		By encountering data through the medium of research papers students will assimilate the ways in which existing data are used in practice, and the ways that scientists plan for the acquisition of new data through observation and experiment.		By engaging with state-of-the-art research, students will assimilate the conventions of academic writing, develop literature review skills, and gain further insights into evaluating results. Written work will further develop students' clarity.
2/2	Research skills	By developing a detailed research design in preparation for the third year dissertation, students will practice organisation, literature review, and other skills, all in the context of focused research in the degree subjects.	By considering how the research will draw on students' deeper knowledge in the degree subjects but also other contextual knowledge, students will gain in appreciation of how insights from areas outside their immediate expertise can be researched and assimilated.			

3/1	Macro-economics 3	By self-directed learning, encountering and practising sophisticated analysis examples, students will attain high proficiency in the major methods of economic modelling analysis and be able to acquire and apply further models through their own study.			By analysis of real-world data sets using professional-grade tools, students will develop robust skills in analysing economic data and drawing out valid interpretations.	
3/1	Special topics	By focused study, reading and experimentation, students will engage with scholarly and practical issues at the forefront of the discipline and therefore develop a clear understanding of how two diverse disciplines can interact to yield new insights and interpretations.				By practising written and oral presentation skills through essays and seminars, students will gain in their capacity to organise clear presentation of their ideas efficiently and cogently.
3/2	Economics option	By choosing optional material that allows students to explore the application of their economic understanding to historical societies, students will develop an integrated view of the power of economic analysis in archaeology.	Depending on the option, students may experience problem-directed collaborative work which will further build appreciation of organisation and efficiency in teamwork.		Depending on the option, students may encounter further methods of data acquisition and analysis.	Depending on the option, modes of argument may be mathematical, written text, oral presentation or other. In each case students will gain proficiency and confidence in engaging critically with materials.
3/2	Assessed seminars		By group preparation of seminars, students will practice teamwork in a scholarly context and so develop their ability to lead teams.			By taking full responsibility for seminar design, students will be challenged to analyse, interpret and present with the full rigour and expectations of scholarly discourse with clarity that makes their seminar accessible to non-specialists.
3/1-3	Dissertation	By focus on a suitable dissertation subject, students will be enabled and supported to identify and develop insights that a combined in-depth understanding of both archaeology and economics reveals, preparing them for future work in both disciplines and at their intersection.				By concentrated investigation and practice in the extended presentation of an argument, students will consolidate earlier learning across the programme.
End (PLOs)		1. Able to apply sophisticated economic models of human activity to the description of human societies of all kinds and ages, and in particular to the interpretation of archaeological evidence.	2. Able to fulfil the role of both economist and archaeologist in an interdisciplinary team, whether addressing contemporary problems or working towards deeper understanding of the development of civilisation, with particular strength in synthesising ideas between disciplines.	3. Able to acquire and analyse new archaeological data, then interpret it in context and with relation to other historical information.	4. Able to acquire and analyse new data on economic behaviour, then calculate, simulate and evaluate impacts on small and large economic units.	5. Able to engage critically with new theory and results offered by experts in both economics and archaeology, using the methods and norms of each to debate, interpret and explain implications to non-expert audiences.

degrees. They are a first draft. Perhaps they are too dense or could be more ambitious. But they could provide a starting point for debate and improvement by a programme team.

Sidebar 6 offers a rough first draft of the programme map (step 3 in the six-step process) for one of these fictitious degrees. The degree in question is combined honours in Economics and Archaeology, and the imagined process was this: Suppose I have been appointed as the programme leader for this programme. I come from one of those two departments, say Economics. For a very first draft of the programme map to get conversation with Archaeology going, I fill in the map for Archaeology modules by going on the web, looking at what's described there and making my best guess about the work students do in those modules. In fact, that is what I did for this illustration, but in both directions (because I don't know either Economics or Archaeology)²¹.

The first draft is rough and almost certainly inaccurate. Part of the reason is that in every entry of the form "By [doing] X, students [become able to do] Y", X is a statement of student work, rather than a list of topics covered, and this is not immediately accessible from many existing module outlines. The next draft would be made collaboratively in step 4 with the people who know. Better knowledge about the kinds of work actually expected in the module would allow more precise statement of X's. Better statement of Y's would also come from module leaders and then be a matter for discussion between programme and module leaders.

Why is the programme map designed as it is? Why produce approximations first?

I illustrated an example of the programme map in sidebar 6 before defining it to show how it summarises diverse module outcomes and work concisely in a regular format. The map represents the learning ladder with a table or two-dimensional grid. It shows modules (in rows) contributing to programme learning outcomes (PLOs, in columns). It includes every module and an accurate second draft would record all the major types of work that students do. The format used at the intersection of every outcome column and module row is the simple "By

[doing] X, students [become able to do] Y" which encapsulates the work, X and the step towards the outcome, Y. These are the *how* and the *what* at module level, and the write-up immediately invites the question *why* for both. Indeed, it is easy to recast the third informal summary of the pedagogy in terms of what the map shows:

- Why is X the best way for students to build the ability Y?
- Why are the contact events in this module the best way to support X?
- Why is the summative assessment in this module the best way to test Y?
- Why is the collection of Ys leading to this programme learning outcome the best way to get there (and are they in the right order)?

So the programme map as illustrated in sidebar 6 does part of the pedagogy's work explicitly and other parts only implicitly. A fuller map, with more structure could document the *whys* and much else. As the pedagogy is rolled out the ProPEL team will continue to work

on the structure of documentation. But the format adopted here meets the aim of simplicity. It is probably the minimum effective structure to fulfil key requirements of the pedagogy. When complete and made accurate it gives both overview and detail. It supports both the design of new programmes and module-by-module or larger modification of existing provision.

If simplicity justifies the minimalist map of student work, couldn't the process for preparing the map also be simplified, by omitting step 3? Wouldn't it be more efficient for the programme leader to email every module leader with the programme learning outcomes and ask for "By X, students Y" statements for their module? On receipt the programme leader would simply plug each statement into the correct place in the map. They have saved themselves the trouble of creating a rough first draft. In fact, why not do the *whole* process in reverse? Collect unconstrained "By X, students Y" from the module leaders, arrange the Ys



into groups, and draft the programme learning outcomes from what those groups of Ys deliver!

The rigorous answer, of course, is that modules serve programmes and not the other way around. Doing step 3 is how the programme leader first sketches assumptions about how modules contribute to the programme and so sets up a programme-level expectation for discussions with module leaders. As to the second idea, programme learning outcomes are specifications not consequences!

But a fuller answer is that design is iterative and practical. That outrageous idea of collating all the module outcomes into programme-wide collections might even inform the drafting of real programme outcomes. Forgoing the rough draft stage might not matter provided that in the successive shaping of programme and module learning outcomes, it is the programme that prevails. In all matters, the process of implementing the pedagogy will be modified by experience. What counts



in the end is that the pedagogy and its tools help the design of ambitious outcomes and effective strands of learning in all York's programmes.

Illustrating Implementation in Practice: The Module Leader

Most staff who encounter the York pedagogy will be teachers on a module. Approached by a programme leader to summarise the work students do and how that moves them towards one or more programme outcomes, they turn the first coarse version of "By X, students Y" into accurate claims for that module.

To illustrate how the module leader might contribute to correction and refinement of the map of student work (step 4 in the outline above) I will give another fictitious example. This time I draw on two of my own former modules but invent supposed programme learning outcomes. I have chosen these modules because I think they illustrate problems and solutions. Again a disciplinary apology: the examples are from one broad subject area so may look similar from the outside.

At the beginning of an introductory module on signal processing, I would tell students that all they had to understand – really understand – was one sentence, which I wrote on the board. The sentence was jargon, but the legitimate jargon of my discipline, pressing together a breathtaking fact about mathematics, an explanation for why one of the most fundamental methods of communication engineering works, and a digression on the nature of reality. True, the module outline, its multiple topics, work and assessments, revealed that there were quite a lot of other things they would have to do in the module too. But I wanted above all for my students to catch the beauty and power of that elegant, underlying insight.

Facing the approach of a programme leader wielding a programme map I would ask: If the heart of the York pedagogy is *doing not knowing*, what of learning that reshapes knowing? The Eureka moment, the Threshold Concept, the wild surmise? We put the gem that inspires in front of our students and turn it till they catch the light. That is not about *doing*: it's about the joy of discovery!

The programme leader would remind me of the programme learning outcomes – things like, "able to test and validate designs in electronic engineering by applying tools of analysis and experimentation" – and I would

"What counts in the end is that the pedagogy and its tools help the design of ambitious outcomes and effective strands of learning in all York's programmes."

find them prosaic against the pearl of profound understanding that I really believed the module was for.

Perhaps reluctantly, I would come up with a "By X, students Y" statement. It would be something like: "By applying Fourier and Laplace transforms to problems of increasing complexity in practical analysis, students assimilate their domains and assumptions, gain facility in their use as design tools, and are able explain their relationship to theory and practice." This is nothing like as satisfying or elegant to me as my sentence of compressed wisdom²². But I would have to concede, it is better for the programme and even half-good on my own terms. It foregrounds a step towards the programme learning outcome (analytic skill that is later going to be applicable very generally in design), which, come to think of it, in my module is quite a big step. Despite not capturing the genius of the maths and methods, it expects students to be "able to explain", which is more hardnosed than my "understand – really understand" and is one of three things that my exam should test. By making me realise that the main means of learning I rely on is practice, it prompts me to review the care I put into structuring the practice examples.

The other example module is in numerical methods. This comprises a bundle of knowledge with connections through error analysis and Matlab, but is mostly a collection of disparate methods (for roots and extrema of functions, interpolation, approximation, linear systems).

It is always possible to write a first draft of this kind of methods lecture module. Something like: "By listening to information presented orally and visually in lectures and annotating handouts or taking notes off the board then memorising structured information and procedures, students add to their store of readily accessible knowledge which will give them greater facility in skills of this programme learning outcome."

The temptation to use a catch-all like that would be increased

because the module was used in multiple programmes (and could be offered across the sciences). Different programmes have different learning outcomes so what the module gives to one may be different to what it gives to another. I might be faced with a programme level outcome like “able to apply computational models to research questions, understanding their limitations and performance” and a programme leader who (rightly) would not take “By listening to...” as an answer.

I think my delivery²³ of Numerical Methods would be challenged by the pedagogy. The so-called catch-all description actually does describe fairly well the way I taught, and although the Y of that statement is defensible for a core methods course, surely I could do better with the X. Running it today I think I would use videoed lectures, notes and animations to convey the information while contact time would be given mainly to structured problems classes including many with Matlab. I would turn in a map entry something like, “By experimenting with a range of practical numerical methods and repeated exposure to error propagation in those experiments, students assimilate the assumptions



and constraints of error analysis for numerical analysis in general, and are able to locate and explain implementations of numerical methods.”

Where does this thought simulation leave me? In one module planning to restructure examples sheets and prepare a new type of exam question and in the other recording lectures and planning new

problems classes and labs. Didn't someone say that moving to the pedagogy expects “a little from everyone”? As one of the everyone I seem to be facing a lot! Yet the improvements make sense. I needed to introduce them anyway. The exercise has not worked against my instincts for improvement; it has focused them into clear next steps.

Footnotes

- Formative and summative are often seen as the two sides of the same thing – assessment. For example, in the NSS, questions about clarity and fairness of summative criteria are grouped with questions about the usefulness of feedback. But in the York pedagogy, formative feedback is part of propelling work which is the means of learning. Summative assessment is the test that learning has happened. There are links between the two – summative assessment may be structured in the same way as formative development of ability (eg through essays or applying methods to particular data), or summative may be used as an incentive to do work. But these are merely links; summative and formative are not variations on the same thing. Like real arms on opposite sides of a torso, these are not glued together. Interestingly NSS results for the questions on summative criteria show different patterns to those on feedback.
- A good example is Mary Warnock who in *Universities: Knowing our Minds* (1989), begins with *being* but quickly slides into *ability to do*: “... imagination, critical insight, and the ability to relate one subject to another are the most important attributes of a graduate. Moreover in a democratic society, one must add the ability to explain issues, both narrow problems and wider implications, to people not themselves experts in a field, but with a legitimate interest in it.” John Searle (*New York review of Books*, 6 Dec 1990) is a more robust *doer*: “Finally, and perhaps most importantly, you need to acquire the skills of writing and speaking that make for candor, rigor, and clarity. You cannot think clearly if you cannot speak and write clearly. If the manner of instruction is adequate, the student should be able to acquire this much knowledge in a way that combines intellectual openness, critical scrutiny, and logical clarity. If so, learning will not stop when the student leaves the university.”
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- See, for example, Jo Johnson's speeches “Teaching at the Heart of the System”, 1 July 2015 at <https://www.gov.uk/government/speeches/teaching-at-the-heart-of-the-system> and “Higher Education: Fulfilling our Potential”, 9 Sept 2015 at <https://www.gov.uk/government/speeches/higher-education-fulfilling-our-potential>
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- The Economics modules are taken from Economics and Philosophy. The Archaeology modules are taken from single subject Archaeology. Because Archaeology expects all first year modules to be taken, I have moved some to second year, to ensure they appear in the combined degree eventually. So far as possible I have kept modules in the terms they currently are. The supposed student work is based on the module by module information on the university website and in some cases on past papers in Economics. In most cases the online information gives a good feel for what the student work might be, in others there is less information and I have simply made up something I think might be plausible. In some cases the work I have ascribed is probably fictitious.
- Complex exponentials are eigenfunctions of linear shift invariant systems.
- Saying “delivery”, with its implication of transfer of a single package of knowledge from the teacher to the students, is challenged by the pedagogy, but not fatally.