

A fresh perspective on progress files—a way of representing complex learning and achievement in higher education

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This article addresses the challenge of developing new conceptual knowledge to help us make better sense of the way that higher education is approaching the ‘problem’ of representing (documenting, certifying and communicating by other means) students’ learning for the super-complex world described by Barnett (2000b). The current UK solution to this problem is the higher education progress file which comprises a transcript, a process (personal development planning—PDP) and the products (records and claims for learning that underlie PDP). The progress file has the potential to embody the disciplinary and transdisciplinary modes of knowledge formation and learning defined and characterized by Gibbons *et al.* (1994). Our primary focus is on learning for the transdisciplinary world and the way PDP might be used to represent this learning. Descriptions and examples are given of five different curriculum assessment models that are being used to support this type of learning. Different PDP implementation models pose different challenges for assessment. While the paper is written from a UK perspective, the issues raised are germane to any higher education system that seeks to value and reward transdisciplinary knowledge and learning.

Introduction to the problem

This article seeks to develop new conceptual knowledge and tools to help us make better sense of higher education curricula as they seek to respond to a world of complexity (Stacey, 2000; Stacey *et al.*, 2000) and supercomplexity (Barnett, 2000a, b). The article was produced as part of the LTSN Generic Centre’s interconnected work themes: (1) Imaginative Curriculum, (2) Personal Development Planning, and (3) Curriculum for Success. By ‘curriculum success’ we mean that students develop the knowledge, skills, awareness and attitudes to become successful learners for this complex world.

The ‘problem’ of assessing and representing students’ learning to a range of audiences in a meaningful way is becoming more complex as higher education recognizes and values learning that is not disciplinary in nature (we will use the term

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‘transdisciplinary’ proposed by Gibbons *et al.* (1994) to describe these other forms of learning that are not discipline-based). In the UK, the progress file is the current systemic solution to the problem. Its objectives are:

- (1) to provide more consistent, comprehensive certification of learning that is primarily discipline-based (see Appendix A for the transcript); and
- (2) to encourage the development of students’ metacognition and self-regulatory capacities and to help learners recognize and record their own learning and achievement (through personal development planning—PDP).¹

This combination of approaches embodied in the progress file provides information and develops the habits and behaviours that are necessary for a life of learning. At a systemic level recording and assessing learning and achievement within PDP frameworks is a relatively new field and our contribution is but an initial step in exploring this largely uncharted territory.

A rich conception of learning in higher education

A central concern of this paper is how higher education sets about preparing students for this complex or even ‘supercomplex’ world (Barnett, 2000a, b). Barnett contends that higher education is faced with preparing students for a world in which we are challenged both conceptually and continually. He remarks that individuals have to take responsibility for continually reconstituting themselves throughout their lifespan, which requires a range of attributes such as flexibility, adaptability and self-reliance. In such circumstances the curriculum might be understood as a set of more or less intentional strategies to produce—in each student—a set of subjectivities. However, the set of subjectivities required for this supercomplex world is unlikely to be spelt out in detail for higher education, yet must involve elements of self-identity, knowledge and action—all of which are subject to societal expectations regarding graduates’ capacity to perform in various roles.

Barnett (2000a) used epistemology (knowing), praxis (action) and ontology (self-identity) as constructs with which to examine contemporary higher education curricula. We will, in contrast, approach the interpretation of contemporary curricula through the twin lenses of complexity theory (Stacey, 2000) and knowledge production theory (Gibbons *et al.*, 1994) and argue that the world requires people to work with both disciplinary (Mode 1) and transdisciplinary (Mode 2) knowledge (Gibbons *et al.*, 1994). It is a world in which directed, self-directed and collaborative modes of learning are all necessary. It is a world in which knowing what and how to learn the next thing is as important as what has already been learnt. In developing the idea that learning is the fundamental concept that underlies the production and use of disciplinary and transdisciplinary knowledge, we are trying to provide a richer conception of the connectivity between the worlds of education, work and life more generally. In our conceptual modelling of curricular responses we are trying to examine how our current approaches to certifying and recording learning and achievement address these different worlds.

Complexity theory is a cluster of ways of thinking that have developed from branches of ‘new science’ concerned with the behaviour of natural systems, such as chaos theory and quantum physics (Tosey, 2002a). Complexity theory is useful for explaining the apparent illogicality of human systems. It offers a radical challenge to notions of prediction and control, e.g. ‘no individual or group of individuals can be *in control* of the whole system. This departs from the dominant discourse in which the only alternative to an individual being *in control* is thought to be anarchy’ (Stacey *et al.*, 2000, p. 124).

Complexity refers to the condition of the universe which is integrated and yet too rich and varied for us to understand in simple common mechanistic or linear ways. We can understand many parts of the universe in these ways but the larger and more intricately related phenomena can only be understood by principles and patterns—not in detail. Complexity deals with the nature of emergence, innovation, learning and adaptation. (Santa Fé Group, 1996; cited in Battram, 1998, p. v)

We can use complexity theory to represent conceptually two different worlds of learning and behaviour. Figure 1 based on the certainty–agreement matrix of Stacey (2000) contains within it three domains of thinking and behaviour. Zone A is dominated by rational, deliberative and scientific thinking and behaviours. It is the zone of common-sense management theory, political, judgemental and ideological control. Zone B represents a more complex and less certain world. It is a domain of high creativity, innovation and transformative learning as people and communities continually adapt and evolve while attempting to solve the problems that emerge through work processes. Zone C represents chaos. In this domain practice disintegrates into anarchy. This imaginative view of the world has been applied to higher education teaching (Tosey, 2002b), the curriculum (Jackson, 2002b) and to

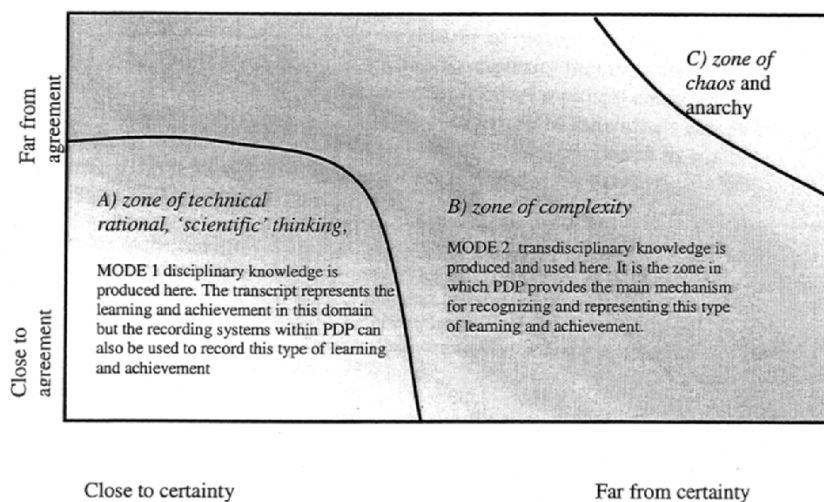


Figure 1. Conceptual framework for understanding complexity theory. Adapted from Stacey *et al.* (2000) and including the two modes of knowledge production developed by Gibbons *et al.* (1994)

academic risk management (Raban & Turner, 2003). We will use it as a sense-making tool for the higher education curriculum and the assessment and representation of students' learning.

Learning for the disciplinary world

Higher education has largely been constructed around what Gibbons *et al.* (1994) called Mode 1 'scientific' disciplinary knowledge. The term embodies the cognitive and social norms and processes that must be followed in the production, legitimization and diffusion of knowledge of this kind. Mode 1 'scientific' knowledge is the knowledge that academic communities create and universities and colleges propagate. Higher education curricula are fundamentally concerned with this type of knowledge, and assessment processes test its acquisition and use through a range of methods that reflect the way knowledge is produced in the subject. Pring (1992, p. 11) captures very well the primary focus for disciplinary learning and the ways in which judgements about this type of learning have traditionally been made.

The academic tradition lays stress upon intellectual discipline and upon high standards of thinking, arguing, enquiring, experimenting, speculating that are part and parcel of an intellectual discipline. Such disciplined ways of thinking develop over time. They are sustained by social arrangements partly recognized in learned societies and professional associations, partly reflected in the power structures and authorities recognized by people with similar interests. [...] There is a dominant academic tradition which sees quality of intellectual endeavour (and the implicit standards of good and bad performance) to lie within specific traditions of disciplined enquiry. Such traditions are defined partly in terms of the relevant concepts, procedures, problems, tests of validity and the use of these concepts etc., more or less effectively, more or less correctly. Thus there are standards but these, though acknowledged in one's intellectual efforts, are more often than not unspoken ... and the application of these standards does not entail explicit formulation of them. Hence the importance of the 'judgement' of those who are authorities within the subject (the academics, external examiners and advisors), and hence the importance, too of a period of initiation—the gradual recognition by the learned of the many standards which are acknowledged within the exercise of intellectual disciplines.

That traditional forms of higher education curricula and learning within the methodologies and value systems of a discipline do prepare us for this world of complexity is undeniable, in so far as so many of us are able to adjust and work with this world regardless of our disciplinary backgrounds. Knight suggests that this is because learning in higher education is itself complex: 'Amongst other things it is about unending disputes, subtle concepts, large amounts of information to be organized and remembered, and emerging understandings of the nature or structure of the subject area itself' (Knight, 2001, p. 369).

The higher education transcript provides a validated, comprehensive and summative certificate of a learner's capacity to work with Mode 1 disciplinary knowledge. It also has the potential to represent learning produced through Mode 2 knowledge working (for example credit awarded for prior or current experiential learning) and it can endorse claims that students had participated in the types of learning experiences that promote capability in Mode 2 knowledge working.

Learning for the transdisciplinary world

The world of professional and work-based learning—the world that most of our students will inhabit for most of their working lives—is not constrained by the cultures and methodologies of disciplinary learning. This world requires capacity and understanding for working with many different sorts of knowledge in order to engage with complex emergent problems for which there may be a range of possible solutions (Eraut, 1994; Nonaka & Takeuchi, 1995; Savage, 1996; Marsick & Watkins, 1997; Cseh *et al.*, 2000). Gibbons *et al.* (1994) used the term ‘Mode 2’ for knowledge production in transdisciplinary, social and economic contexts. Such knowledge has to be useful to someone and fulfil a particular purpose and this imperative is central to the knowledge production enterprise. Mode 2 knowledge is produced through a process of continuous negotiation. It arises from knowledge production in a continuous succession of transient and emergent problem-working contexts and situations. Mode 2 knowledge production is not so dependent on the existence of codified knowledge to solve current and emergent problems that are local and heavily contextualized. Rather, it seeks to harness the know-how embodied in current and emergent practice in working communities and the markets where such knowledge will be used. Curricula that are designed to promote capabilities, behaviours and creative habits of thinking that are necessary for this world pay particular attention to the processes of learning (Jackson, 2002b, 2003).

Increasingly over the last two decades UK higher education is recognizing and adopting conceptions of learning that attempt to address directly the needs of this transdisciplinary world of learning. Appendix B provides some examples. The following approaches can be distinguished within the examples:

- a small number of key skills typically modelled on the QCA² conception
- a small number of more holistic capabilities
- comprehensive qualities and attributes profiles
- a framework for self-management
- a framework for reflection and increasing self-awareness of the experience of learning in higher education and wider life experiences including part-time and voluntary work.

Appendix C provides a flavour of what employers think are the skills, competencies, capabilities, attitudes and behaviours required for success in the transdisciplinary world of learning. Some institutional conceptions of learning for a transdisciplinary world appear to be closer than others to the perception of people who inhabit the transdisciplinary world.

How does higher education recognize these two worlds of learning?

The central proposition of this paper is that the progress file is an attempt to solve the problem of how we represent learning and achievement for a world that requires people to understand and demonstrate their capacities for working with both disciplinary and transdisciplinary knowledge. Implicit in the conception of the

progress file is the notion that, while universities and colleges can take primary responsibility for the assessment and representation of disciplinary learning and achievement, learners themselves must take primary responsibility for evidencing and representing their learning and achievement in, and for, the transdisciplinary world.

The next five sections consider how these different worlds for learning are reflected in the curricula and assessment patterns of institutions. We propose five different curriculum-assessment environments. The boundaries between these representations may be blurred and different models may exist in the same institution. Their value is in using them heuristically to reveal the overall characteristics and intentions of curricula and assessment designs and the thinking that underlies them.

1. The 'additional' curriculum

In this representation of a curriculum, students experience different types of learning but they are hidden within the academic curriculum. There will be a programme specification that sets out the intended learning and there may also be module or unit descriptors that identify learning, but little attempt will have been made to systematically trace approaches to learning through the curriculum. Teaching and assessment focus primarily on the acquisition and use of disciplinary knowledge and there is little formal recognition of other sorts of learning. Student recording of their own learning is likely to be limited or non-existent (except where it is a requirement for professional recognition). Consequently the academic transcript might be the only record of learning available to a student. We recognize five extracurricular strategies being used in UK universities to extend students' learning beyond the disciplinary focus and engage them in reflecting on and recording their own learning and their experiences of learning.

Strategy 1. Personal development planning is being introduced as a support mechanism within a personal tutor system for all students (e.g. University of Nottingham Personal Academic Records³). In this scheme students monitor and reflect on their academic and personal development and produce simple records that form the basis of conversations with their tutors. No additional certification results from the strategy but students will have personal records to draw upon.

Strategy 2. An extracurricular award framework is provided to explicitly develop non-academic skills and involve students in recording and reflecting on their own learning (e.g. York Award or Essex Skills Award, the UMIST and University of Manchester Work Experience Certificate—Appendix B. All these frameworks are available on a voluntary basis to all students).

Strategy 3. The development of four-year programmes which include a placement year in industry such as occurs at the University of Surrey where nearly 80% of students undertake the professional year. This enables recording-reflecting-action planning to be embedded in a work-based curriculum.

Strategy 4. Part of an institution (e.g. department) adopts an external award framework in order to enable students to get recognition for their learning outside the academic curriculum. For example, the Department of German at the University of Leeds has adopted the City and Guilds Licentiate Scheme to enable students to reconfigure their 'Year Abroad Log', thereby enabling them to demonstrate how they meet the requirements for the six skill areas as defined by the City and Guilds scheme. Other national bodies like the British Council, National Union of Students, and Student Volunteering UK also have schemes for recording students' learning in extracurricular or experiential contexts. Some professional bodies are also taking an interest in this area and the Royal Society of Chemistry has recording schemes at undergraduate and postgraduate levels. These schemes attempt to recognize and value students' experiences of learning in and for the transdisciplinary world.

Strategy 5. The development and use of an automated profiling tool. The University of Liverpool's LUSID interactive web-based PDP tool⁴ provides a good example. It supports recording, planning, skills auditing, automatic CV construction, skills guidance and a reporting facility. Guidance and support is provided throughout the system to promote independent PDP.

2. An 'explicit curriculum'

The initial step in developing an 'explicit curriculum' is to make explicit, through programme and module specifications, the opportunities that can be made available for different types of learning. There may also be an attempt to trace through the ways in which different types of learning are being developed across and through the curriculum. Teacher perceptions of students' learning stretch beyond the interests and concerns of the discipline, and teachers and students are aware of the range of skills and other learning that is being developed across the curriculum. If these are expressed as learning outcomes, then they will also be explicitly assessed. This in turn will impact on the assessment methods that are used. If sufficient care has been taken to ensure progression of different types of learning through the curriculum, students could make claims that they have developed knowledge, skills and capabilities in line with those reported in the programme specification and an institution could, in theory, publish a statement to this effect.

The next step in the implementation of an explicit curriculum is to actively broaden students' skills base and knowledge of learning processes (the skill of knowing how to learn in different contexts is the meta-skill for working with transdisciplinary knowledge). This is often achieved by introducing learning approaches that are skills-based, problem- or enquiry-based, work-based, or another type of curriculum that is activity or process-based. In these curriculum units learning other than academic-related learning will be assessed and credit will be gained for the learning demonstrated. Structured and guided processes to encourage learning through reflection and action planning processes within these units encourage students to record and manage their learning. In time, units introduced at different levels might be connected to create a continuous, additional curriculum

and PDP process. This would permit students to maintain a more or less continuous record of their learning.

Curriculum units that focus on the development of skills (including skills and behaviours for PDP) may be generic in their conception (but customized by departments, e.g. University of Surrey) or they might be developed locally within departments (University of Leeds). There might also be cross-institutional process-based learning modules that use PDP as a core learning process. The work-based learning modules at the University of Exeter (Appendix B) provide a good example of this approach. There are also examples of experiential learning (for example game play, role play, simulations, enquiry-led learning, problem-based learning, and context-based learning case studies (see Boyle & Smith, 2002) and of strategies within the curriculum being connected to personal development through PDP (Boyle (2003, personal communication) has provided examples at the University of Leeds). These imaginative experiential contexts provide rich opportunities for process-based learning that connects well with the process-based learning approach of PDP.

In the more systematized version of this representation of a curriculum the development of skills and capability becomes an important focus in the curriculum and assessment and the institution wants to make claims to this effect. The mapping of skill and capability outcomes across the curriculum becomes an important focus in the design and validation process, and skills are explicitly assessed and recorded by the institution. Students are encouraged to contribute to the development and enhancement of their own learning profiles through a formal PDP policy, and guidance and tools are provided to help them achieve this. In some cases the curriculum model places responsibility on students to create the evidence of achievement of learning outcomes that are difficult to assess, one approach being portfolio building in, for example, medical education and other professional courses.

Another important step in the recognition of learning derived from the transdisciplinary world is valuing the learning that students bring with them and the use of strategies for enabling students to understand their current position so that they can plan effectively for their further development. At the University of Portsmouth, students' perceptions of their skills are evaluated at the point of entry through questionnaire survey and these are used to inform initial discussions with tutors and to identify how the skills gaps of individuals might best be addressed. The process is intended to be the first step in a comprehensive PDP process. At a more sophisticated level, knowledge and skills derived from experiential learning can be mapped against learning outcomes for university modules in order to gain academic credit for an award (Accreditation of Prior Experiential Learning (APEL)). This requires the development of students' capacities with the support of specialist tutors and guidance in order to enable students to create detailed records of their learning and to map the evidence of their learning against the explicit knowledge and skill outcomes of vocationally relevant modules and programmes (techniques used extensively in model 5).

At the University of Luton, skills are explicitly identified and assessed in all modules. Passing the module implies that evidence has been provided to demon-

strate achievement of the standards for the skills listed, and this information is captured through the student records system. At the end of the programme a skills transcript can be generated listing the skills acquired and the number of times the student has encountered them in their level 3 (final-year undergraduate) studies. In the light of progress file developments the institution is extending the process to include the learning dimensions of PDP. The institutional approach will capture students' learning through:

- examples of their work
- extracurricular activities, and
- personal development planning.

Students will be assessed on this through a PDP spine, and the final 'skills transcript' will capture the skills identified in the dissertation/project module which staff will derive based on the subject benchmarks and the university's skills descriptors. The institution is adopting the QCA key skills descriptors as a reference point, but not using them for assessment purposes.

University College Worcester is using a Student Qualities Profiling tool containing 23 items (Appendix B) distributed in five categories : subject-specific, personal learning, social, communication and practical. The College is seeking to embed PDP in all learning activities, e.g. modules, tutorials, Student Union activities, etc. To achieve this it developed an agreed language to talk about the learning and transferability of learning from one area to another—the language of skills and qualities. Students develop their own progress files, based on information given them through modules about the skills and qualities they should be developing. It is a requirement for the validation of subject areas and their modules that they clearly state the skills and qualities that study in their area promotes. The focus of the PDP tool and process is on:

- learning through reflection
- encouraging students to take responsibility for their own learning
- action planning
- encouraging students to understand the process of learning
- providing a focus for discussion with tutors, and
- recording.

Students complete record sheets relating to their modules, personal tutoring and wider experiences. Quality criteria are provided to guide self-evaluation and the content of the file is available for discussion at personal tutorials.

Anglia Polytechnic University has adopted the use of assessed modules to record students' PDP (Appendix B). All undergraduate programmes are required to have a set of Graduate Outcomes (typically about eight) and, as a condition of validation, all programmes have to say where they are met. Assessment of the achievement of these outcomes is through a reflective portfolio produced in their final year. This ensures that students own the process and are aware of how they have developed their skills.

In such curricular environments, on completion of their programme, students can

justifiably claim that they have developed the skills that are set out in the programme specification. They may be able to evidence this through a PDP portfolio and the institution may be able to endorse skills claims through certificates where assessment has validated claims. This overt institutional concern for skills is likely to impact directly on the thinking and perceptions of teachers (the majority of whom will adapt their teaching, curricula and assessment), but it will not necessarily lead to wholesale curriculum reform. This curriculum pattern is moving towards a more integrated view of the two worlds of knowledge production.

3. A curriculum based on a model of learning

In this model the curriculum and assessment process are framed around a model of learning. This is another adaptive response to a transdisciplinary world in which knowing how to learn and understanding the process of learning underpin the educational enterprise. An example of this might be the adoption across a whole curriculum of a problem-based approach as has occurred in a number of medical schools and less frequently in subjects like engineering.

Another example is the creation of a curriculum around abilities and competencies that comprise the core learning outcomes across all disciplines. We are not aware of any UK institution adopting this as a curriculum model. The best-known example of this approach is the ability-based Curriculum of Alverno College in the USA,⁵ which is based on eight core abilities (communication, problem solving, analysis, valuing in decision making, social interaction, global perspectives, effective citizenship and aesthetic responsiveness) and six levels of ability. These abilities run through the curriculum regardless of the disciplinary context and they are the basis for all assessment and the recording of students' achievement. Tutor-supported PDP is integral to learning and students maintain their own electronic portfolios to monitor their own progress and provide evidence of learning.⁶

While there are no examples in the UK of a whole institution adopting this approach, a number of UK institutions are trying to embed the idea of core abilities in their frameworks for curriculum design (e.g. Oxford Brookes University and Anglia Polytechnic University).

4. An institutional transdisciplinary curriculum

This type of curriculum assessment model avoids the difficult process of adapting an existing academic curriculum to create opportunities for learning for a transdisciplinary world by creating a new curriculum for that world. In the UK the new Foundation Degrees provide us with a contemporary example of this.

Foundation degrees are intended to equip students with the combination of technical skills, academic knowledge, and transferable skills and meet intermediate skills needs across all sectors of the economy. Prospective foundation degree programmes should

prepare students for employment in specific areas of the economy where there is evidence of a demand for higher technical and associate professional skills. (Higher Education Funding Council for England, 2000, p. 5)

A national specification (HEFCE, 2000 p. 6) sets out the parameters for learning:

- technical and work-specific skills, relevant to the sector underpinned by rigorous and broad-based academic learning
- key skills in communication, team working, problem solving, application of number, use of information technology and improving own learning and performance
- generic skills, for instance, reasoning and work process management
- students must demonstrate their skills *in work* relevant to the area of study
- *work experience* should be sufficient to develop an understanding of the world of work and be validated, assessed and recorded
- students should also be able to gain academic credit for experiential learning
- employers should be involved in the design of such programmes.

It is the first UK higher education award that specifically embeds the records of learning in the design specification.

- *Learning* should be recorded by a transcript, validated by the awarding higher education institution (HEI) and underpinned by a personal development plan.⁷

These are the principles that underpin curriculum design and they are intended to enable students who work in the transdisciplinary working world to engage in higher education learning that is directly relevant to this world. There are many examples of Foundation Degree programmes.

5. A personal curriculum for a transdisciplinary world

This curriculum and assessment model differs from all the others because it is based on the idea of a negotiated personal curriculum that meets the transdisciplinary learning needs of an individual. Learning programmes are a mixture of work-based projects or portfolios of activities, distance or online learning, institutional or workplace courses, collaborative or network-based learning. In this model the reflection and self-evaluation that underlies PDP is the process through which learning and achievement are recognized. These programmes also include student-generated records of learning for the purpose of awarding academic credit for prior or current experiential learning. The learning described in these records is personal and heavily contextualized. Academic credit is gained in one of two ways: by mapping learning against the outcomes for existing academic modules, or by demonstrating learning against negotiated learning outcomes that are themselves aligned with level descriptors that contain within them the dimensions of the academic standards being sought. The model is found in negotiated work-based learning schemes like those of the University of Middlesex and the University of

Portsmouth. Work-based learning modules that use this framework may be found in any of the previous scenarios although they are still not very common in UK higher education. The University of Exeter Learning from Experience module provides a good example.⁸ The University for Industry's *Learning through work* scheme provides a national award scheme and online support and guidance system for this type of learning.⁹

Assessing transdisciplinary learning through PDP

The role of assessment in our emerging conceptual framework for transdisciplinary learning is complex, exhibiting many issues similar to those identified for student-centred learning (Gibbs, 1995). There are many examples of established assessment regimes that have been developed to work with transdisciplinary knowledge and learning (negotiated work-based learning and problem-based learning would be good examples). The fact that robust assessment models for process-based learning exist bodes well for PDP. But the introduction of PDP with its many different curriculum interpretations introduces new dimensions to the 'problem' of assessing and assuring the quality of this type of learning.

Given the early stage in the development of systemic knowledge about the assessment and representation of transdisciplinary learning, we have begun to map the approaches that are being used in different approaches to PDP (see Appendix D for an example of its use).

The form of assessment will reflect the way in which PDP is being implemented. Different implementation models and the beliefs and purposes that underlie them will foster different types of assessment regimes and create different situations for the validation of student claims for learning made through PDP-type processes.

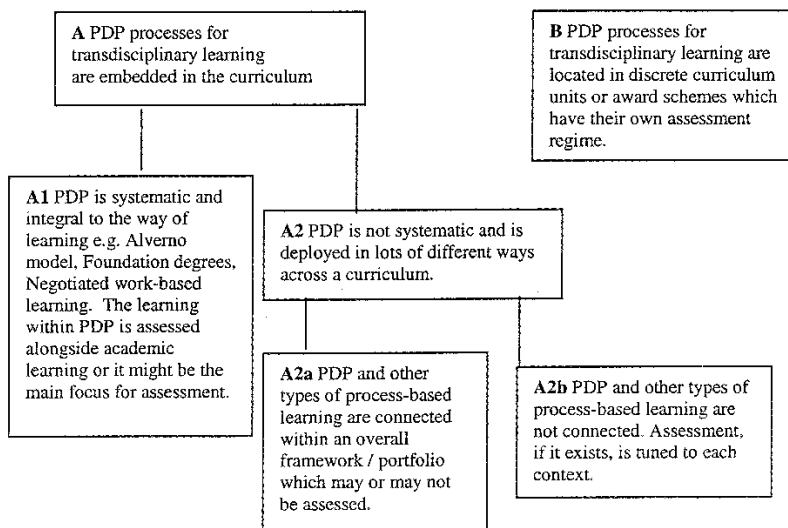


Figure 2. Simple conceptual framework to consider the nature of the assessment regimes associated with different models of PDP implementation.

Figure 2 provides a simple conceptual framework to understand the types of assessment regime that might be associated with PDP.

How students encounter and engage with PDP approaches to learning varies according to the implementation model. We can recognize both embedded (A) and additional curriculum models (B). In the case of the latter freestanding modules/units or award schemes PDP is integral to learning and students are assessed. In the embedded approach there are a number of possible ways in which students encounter PDP.

- A1—students have to engage with this way of learning as it is central to learning and achievement.
- A2a—the strategic framework will encourage students to engage with and make sense of this way of learning.
- A2b—student engagement may be patchy (some aspects might require participation on a voluntary basis) and they may have difficulty making sense of the process of learning through PDP.

Discussion

This paper seeks to throw some light on a complex systemic intervention (progress files) in the context of a world that has multidimensional needs which require increasingly detailed and specific information. While the progress file attempts to meet some of these information needs, it also tries to address (through PDP) the capacity issue that underlies the creation of information for a world that wants information that only an individual can provide about him/herself. By developing the capacities and behaviours that encourage the construction of personal information resources about learning and performance, the people in the system become more actively involved in gathering, evaluating, giving and using this type of information.

But does the progress file and the capacities within it actually deliver the information that is required to the people who need it? Surprisingly, there has to date been very little empirical evidence regarding this question. There is however a substantial research study being undertaken in south-west England to gain a range of perspectives on this question (Croot, 2003, personal communication).

By looking at PDP from the perspective of different curriculum models, we can see that it can be implemented in many different ways and has different relationships to the overall learning enterprise. We can see that in some situations it might appear fairly marginal to the ‘academic’ learning enterprise whereas in others it might be a core learning process. Clearly, different scenarios will result in different impacts and this poses a real challenge to researchers of PDP.

A key research question is ‘does PDP actually improve learning and the capacity to learn?’ The common-sense answer is likely to be along the lines of ‘yes, when it is done well’. Clearly there is a need to ensure that it is done well, and there are three routes currently being used to examine this question.

Route 1. Synthesis of relevant scientific knowledge

The first route is to relate PDP to how people learn. In 1999 the US National Research Council published the results of a research synthesis aimed at answering this question. The report¹⁰ identifies three principles for effective learning framed in terms of what teachers need to do (i.e. a set of principles for instruction).

- (1) Students come to the classroom with preconceptions about how the world works. If their initial understanding is not engaged they may fail to grasp the new concepts and information that are taught.
- (2) To develop competence in an area of inquiry, students must:
 - have a deep foundation of factual knowledge
 - understand facts and ideas in the context of a conceptual framework
 - organize knowledge in ways that facilitate retrieval and application.
- (3) A *metacognitive approach* to instruction (and presumably self-instruction) can help students learn to take control of their own learning by defining their own learning goals and monitoring progress in achieving them.

The implications of these basic principles are that higher education needs to help students:

- recognize their perceptions of how the world works and enable them to modify and extend these perceptions (Principle 1);
- develop their capacity to create new factual knowledge, invent new conceptual frameworks with which to make sense of this knowledge and develop the capacity to consolidate, organize and connect this knowledge to their existing knowledge (Principle 2); and
- develop their metacognition so that they can engage in self-directed learning that is effective (Principle 3).

PDP has the potential to support a metacognitive approach to learning. It can therefore be argued that PDP (when it is done well) will support an important fundamental principle of how people learn.

Moving beyond the principle that a metacognitive approach is a good thing, we can then search for scientific evidence that processes that connect reflection, recording, planning and action to improve student learning result in positive learning outcomes and improved achievement. Gough *et al.* (2003) have recently mapped the field of knowledge relevant to the research question 'What evidence is there that processes that connect reflection, recording, planning and action improve student learning?' An initial trawl of the English-language world literature since 1982 resulted in 14,271 potentially relevant studies being identified. The abstracts and titles of these documents were evaluated using a range of criteria developed by a PDP user group in collaboration with the research team, and 982 documents were identified as being worthy of further analysis. Of these documents, 813 were accessed and read and evaluated using the criteria developed, and 158 of these documents were subject to more rigorous analysis and keywording to produce a map of the research field. The study focused on identifying the most relevant

experimental studies. Twenty-five researcher-manipulated studies, considered to provide the best research evidence on the impact of this type of learning, were subject to detailed analysis and data extraction. Nineteen of the experimental studies had a moderate or high quality rating using quality assessment criteria developed by the research team. Seventeen of these studies provided evidence of positive impact on students' learning. There is thus some empirical knowledge that the thinking and behavioural processes that underlie PDP will, if done well, result in good learning.

Route 2. Synthesis of institutional evaluations and practitioner action research on PDP implementation

PDP and forms of recording achievement have been around for quite a long time and there are many evaluations of impact. Although these are not scientifically based (in the sense of controlled experiments), they do provide evidence of practitioner perceptions and institutional community views on the impacts of particular approaches to implementation. The study of Gough *et al.* (2003) has accumulated a large database of publically accessible evaluation studies which will be analysed during 2004 to draw out the main lessons and principles of effective implementation. However, there is also a need to develop the infrastructure so that institutions can pool the results of unpublished evaluation studies. This will be developed by the new Higher Education Academy in collaboration with the Centre for Recording Achievement.

Route 3. Examining PDP against theoretical models of learning

The third route to a knowledge-informed answer is to examine PDP from the perspective of the models of learning that it is intended to promote. This is conceptual knowledge that enables us to evaluate PDP practices against theoretical models that are scientifically proven to work. A comprehensive review of relevant learning theory is beyond the scope of this paper. In essence, the thinking, attitudes and behaviours that PDP can promote can be related to constructivist theories of learning. Constructivism is a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. Learners actively take knowledge, connect it to previously assimilated knowledge and make it theirs by constructing their own interpretations and understandings. There are several forms of constructivism: individual, social, cognitive and postmodern (Steffe & Gale, 1995). Well-structured PDP engages learners as individuals with the constructivist view of learning through the thinking processes, actions and results that flow from:

- the strategic process of thinking and planning
- doing things to construct one's own learning
- recording learning experiences and results
- reviewing and reflecting on these experiences, and hence learning and gaining deeper understandings; and
- using this personal knowledge to inform decisions and actions in the future.

Biggs (1985), drawing on constructivist thinking, coined the term ‘metalearning’ to describe both the process of ‘being aware of and taking control of one’s own learning’. Metalearning is a subconcept within metacognition. It is ‘thinking about how we ourselves learn, and can learn and develop more effectively’ (Cowan, cited in Jackson, forthcoming). Taking control of one’s own learning requires learners to consciously regulate their thinking and behaviours in ways that will achieve desirable outcomes and results for a particular context. In order to do this they must believe that they can do it. It is therefore important to consider PDP in the context of self-regulated learning (Schunk & Zimmerman, 1998; Zimmerman, 2000; Zimmerman & Schunk, 2004) and theories of self-efficacy (Bandura, 1997).

Handling the process

Assessment within different models of PDP implementation is a complex multi-dimensional issue. We offer the following comments in the spirit of a developmental conversation.

We need to be clear that PDP-type processes are underpinned by an appropriate theory of learning. Because PDP contains within it the idea of learning through reflection and action, it has traditionally been linked to Kolb’s (1984) experiential learning cycle. However, a more relevant learning theory is the self-regulation theory of learning developed by Zimmerman and others (Zimmerman, 2000). Interest in the model has been encouraged by the growing awareness that personal success involves more than innate ability and exposure to good teaching. It also requires the personal qualities of initiative, persistence, belief in self and self-direction. Ultimately it supports an autodidactic (self-directed) model of learning.

Different implementation models of PDP aim to achieve different purposes (Jackson, 2002a) and there is a need to ensure that there is congruency between the purposes, aims, objectives and intended outcomes and the methods of assessment and criteria used to evidence and assess learning. PDP processes for learning may be assessed formatively (to assist learning), summatively (judgements for credit), a combination of formative and summative approaches, or not assessed. Assessment models have to be carefully thought through so that they do not conflict with the values and purposes of the PDP process—for example, using a summative form of assessment on a summary of a learning log or reflective journal rather than considering the whole log and the process of learning it reveals.

Given the emphasis on self-identity and personal autonomy in PDP, we need to be clear about which material produced by the student should remain under his or her control, and what should be shared for the purposes of assessment with the tutor.

Many teachers in higher education will have little experience of evaluating the types of learning that is being evidenced through PDP, and tutors are likely to require support to develop their own practice so that they can make reliable judgements about what are often unique learning outcomes. In the case of learning that is not assessed, the motivation for engaging with PDP might simply be to

provide a basis for rich and purposeful conversations between tutors and students. The focus, then, is one of strengthening the support and guidance that tutors provide and building tutor knowledge about individual students.

Given the 'fitness for purpose' issue identified above, we would suggest that all PDP-type processes need to include within them self-assessment in which learners make judgements of their own learning and performance and determine what actions to take to improve. Self-assessment/self-evaluation is the universal assessment concept within these processes and it is integral to the self-regulation theory of learning (Zimmerman, 2000). Learners need help and support in understanding and managing the self-assessment process, in understanding the role of evidence, and in the use of frameworks, criteria and reference points to make valid judgements about their own learning. At present some PDP frameworks provide little support to help students develop the skills for judging self and for presenting evidence to support judgements. Though this is an essential rationale for many PDP schemes, it does not always feature in the assessment process.

It may also be important to support learners in valuing the learning from situations in which total success was not achieved—something that our current assessment systems generally do not do. In life some of our most important learning derives from situations when things have gone wrong (perhaps working in the chaotic zone of Figure 1). PDP offers opportunities for recognizing this type of learning, but this is a challenging area for students and tutors.

Finally, the quality assurance of PDP assessment processes and outcomes is an important emergent issue. Figure 2 shows a number of scenarios. Some of these (A1 and B) are more amenable to systematic assurance. For example, external examining can be assimilated in the model. But the less systematic models might be more problematic for quality assurance. While external examiners will be specialists in their own disciplinary fields, few are likely to have the experiential knowledge and professional understanding to assure the quality and standards of transdisciplinary learning evidenced through PDP.

In conclusion, these issues are part and parcel of developing a new area of practice. PDP and the curriculum changes that accompany its introduction will undoubtedly challenge us but the prize of being able to engage more systematically with the world of transdisciplinary learning is great.

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Notes

1. 'PDP is a process that is undertaken by an individual to reflect upon their own learning and achievement and to plan for their own educational, academic and career development' (www.qaa.ac.uk/crntwork/progfileHE/contents.htm). PDP is proxy for a number of constructs that attempt to connect and draw benefit from reflection, recording, action planning and actually doing things that are aligned to the action plan (Jackson, 2002a). In North America the Electronic Portfolio movement (Cambridge *et al.*, 2001) has many similarities to PDP and many UK HEIs are developing electronic portfolios to support PDP. Jackson (2004) proposes that the model of self-regulated learning elaborated by Zimmerman (2000) provides an underpinning for PDP.
2. The Qualifications and Curriculum Authority (QCA) (England) is responsible for regulating all education outside that which is regulated by universities. It has defined and developed standards for six key skills—communication, application of number, information technology, working with others, improving own learning and performance, and problem solving (<http://www.qca.org.uk/nq/ks>).
3. See <http://www.nottingham.ac.uk/padshe/>
4. See <http://lusid.liv.ac.uk/>
5. See http://www.alverno.edu/educators/ability_curriculum.html
6. The Diagnostic Digital Portfolio can be found at <http://www.alverno.edu/academics/ddp.html>
7. The personal development planning web tool for Thames Valley University Foundation degree scheme can be viewed at <http://progressfiles.tvu.ac.uk>
8. See <http://www.jewels.org.uk>
9. See <http://www.learnirect-ltw.co.uk/ep/web/home/ltwhome/homepage/>
10. See <http://books.nap.edu/books/0309065364/html/l.html>

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Appendix A. Recommended data set for a higher education transcript

www.qaa.ac.uk/crntwork/progfileHE/contents.htm

Information about the learner

- Name
- Date of birth
- Institutional reference number
- HESA reference number

Information about the award

- Name of qualification
- Level of qualification in National Qualifications Framework (NQF)
- Name of awarding institution
- Name of institution responsible for delivering the programme
- Language(s) of instruction (*to meet EC requirement*)
- Language(s) of assessment (*to meet EC requirement*)
- Professional Body accreditation
- Statutory Regulatory Body recognition/approval
- Professional/Statutory Body recognition (*if applicable, an indication that in gaining the award a candidate has satisfied the academic requirements for registration or membership etc*).
- Date of award

The record of learning and achievement embodied in the award

- Name of programme

- Module or unit study code (this should also indicate the level in the NQF [National Qualification Framework] that the module/unit is studied)
- Module or unit study title
- Number of credits awarded for each module/unit completed
- Date (year) in which credit awarded
- Mark or grade for each module or unit studied
- Number of attempts to complete a module/unit (if more than one attempt made)
- Overall credits achieved
- Overall mark/grade
- Overall classification or performance indicator (eg merit/distinction)

Other types of learning embodied in the award

- Study Abroad (include ECTS credits if applicable)
- Work placement
- Work experience
- Accredited prior certificated and experiential learning
- Accredited Key Skills

Authentication

- Date of issue
- Signature/seal of awarding authority
- Telephone number for validating information

Explanatory information

- Guidance on how to interpret the transcript [...]
- Information on the grading scheme
- Overview of the National Qualification Awards Framework (to be agreed by national bodies)
- Overview of the UK higher education system (to be agreed by national bodies)

Institutions that do not operate a modular or unitized, credit-based curriculum would be expected to provide a comparable level of information on the record of learning and achievement of an individual

Appendix B. Illustrative examples of schemes, frameworks, module structures and profiling tools that encourage students to audit, record, reflect on and evaluate their own learning and achievement. Readers are invited to add to the list and to provide actual examples to the authors

University of Surrey Students develop capability in a number of skill areas in modules such as Learning to Learn, Scientific Communication, Developing Academic Skills and/or connected to personal tutoring. Self-audit tool includes criteria for self-evaluation of performance in the areas of: working with others, time management, retrieving and handling information, use of IT, study skills, numeracy, communication skills (<http://www.surrey.ac.uk/Skills/>).

Anglia Polytechnic University has created assessed modules to record students' PDP. The "Graduate Skills" portfolio, is a reflective and evaluative account completed by students in their final year providing evidence of learning in eight outcome areas

- Work with confidence both independently and as a member or leader of a group/team
- Demonstrate a capacity for systematic, conceptual and critical thinking
- Show flexible and creative approaches to problem solving
- Communicate clearly and appropriately demonstrating a sense of audience
- Manage information effectively in a range of media

- Act in an ethical manner, demonstrating political, social and cultural awareness
- Produce output which is literate, numerate and coherent (in whatever form is appropriate)

University College Worcester Student Qualities Profile – skills and qualities

<http://www.worc.ac.uk/LTMain/LTC/Profile/menu.html>

On-line and paper based profiling framework covering a list of:

- Subject specific
 - Content
 - Nature
 - Context/professional practice ethics
- Personal Learning
 - Approach to learning
 - Application of learning
 - Reflection and self-assessment
 - Planning and time management
 - Responsibility and independence
- Social
 - Group work
 - Interaction
 - Empathy
 - Ethical principles and practice
- Communication
 - Structuring communication
 - Written communication
 - Oral communication
 - Visual communication
 - Languages
- Practical
 - Information skills
 - Primary research
 - Lab/field work
 - Using source materials
 - Numeracy
 - Communication and information technology

University of Exeter conceptual framework based on self-management

The framework is based on extensive research involving academic staff, students, former students now in employment and employers (Dunne 2002). It consists of four broad areas of management skills - of self, others, information and task. The explicit focus on 'personal management' is central, emphasising the importance of 'managing oneself', 'taking responsibility for self' on the journey towards self-regulated and independent learning. The framework is predicated on a curriculum that is embodied within substantive subject knowledge; syntactic skills (what it means to be an 'engineer', an 'historian'...); knowledge of ways of working and the processes of learning; and the complex inter-relationships between these areas. Within this conceptualisation, there is a requirement for students to be active in the construction of knowledge in their discipline and about themselves; to become aware of themselves as learners; and to be active managers and evaluators of their own progress and personal growth. These skills are generic in that they can

potentially be applied to any discipline or programme of study, to the workplace or indeed to any other context; and to vocational and non-vocational, traditional and innovative provision. Further description and the framework found at <http://www.ltsn.ac.uk/genericcentre/index.asp?id=17394>.

Extra-Curricular Awards Frameworks

University of York - York Award (<http://www.york.ac.uk/admin/ya/stu.html>) is probably the best known institutional award which seeks to provide evidence of skills and experiential learning through and outside the academic curriculum. The Award Framework has four elements:

- Academic curriculum* – development and use of personal academic development plans supported by personal tutors within academic departments
- Career-related experience* – enabling students to demonstrate learning and skills they have acquired through work placement, casual work and voluntary work based on an analysis of the work environments and their own role within it
- Personal interests* – values students' personal interests and helps them demonstrate learning acquired through active involvement
- Supplementary courses* – the acquisition and further development of skills through participation in extra-curricular skill-development courses

To gain the award students must gain 100 points across the four areas (there are minimum points requirements in three of the areas). 10 points are equivalent to 50hrs of work/effort. Recording and learning through reflection is a core learning process. Students are expected to invest a minimum of 5hrs of recording and analysis of learning for each of the 50hrs experiential learning. To gain the award students:

- Keep personal records of their learning experience and their own development
- Create a series of statements that make claims for their learning and development in each of the four areas
- Develop a portfolio of evidence to support these claims based on their personal records
- Submit their claims and portfolio and give a short oral presentation to an assessment panel.

University of Essex - Essex Skills Award

(http://www.essex.ac.uk/esa/EssexSkillsAward/gaining_esa_p1.htm) embraces six key skills - Communication, Working with Others, Information Technology, Numeracy, Problem Solving and Improving Own Learning and Performance. Certification shows that students have participated in a series of relevant short courses and achieved a level of competency deemed appropriate by the owners of the award. Certification is linked to a concise personal portfolio which sets out targets and actions in each of the key skills areas. An 'Improving Own Learning and Performance' statement within this portfolio enables students to describe their learning experiences and learning gains. The production of this statement demonstrates ability to reflect on own learning experiences and achievement commensurate with the idea of PDP. This is a good example of connecting institutional certification with the evidence of learning that underlies the certificate. It also shows how aspects of PDP might be formally certificated by an institution.

UMIST offers a work experience certificate through its careers advisory service to enable learning to be recognized for part-time or vacation employment and work placements of over 70 hours. There are four core elements: half day pre- and post- experience workshops organized by the Careers Service, Skills review and log (on line plus available in hard copy), plus a company evaluation (employer feedback questionnaire). Students must complete pre- and post-experience checklists to show their learning gains. Fourteen skill areas are defined. Four are compulsory (organisation, communication, team working, problem solving). Students choose a further four from ten (presentation, IT, customer/client service, marketing and promotional, assertiveness, negotiation skills and influencing others, project planning and management, networking and information search, delivery of ideas, information, leadership and motivation) to suit their development needs and chosen working context.

Web Profiling Tools

University of Liverpool's LUSID interactive web-based PDP tool supports recording, planning, skills auditing, automatic CV construction, skills guidance and a reporting facility. Guidance and support is provided throughout the system to promote independent PDP. The recording section can be used to collate details of learning experiences, including employment information, educational achievements and work-based learning logs. All experiences can be analysed in terms of skills used and knowledge gained. The action planning section allows the planning of goals and activities either by the use of an interactive Gantt Chart, or by importing a pre-defined plan. An individual's skills can be audited and, based on this, guidance is provided through the system to help improve competence. The reporting section can be used to draw together all data stored within LUSID in the form of a CV.

Appendix C. Learning for a transdisciplinary world

Employer views on the competencies for the transdisciplinary world of learning

Top 10 competencies sought by employers. Based on web site search by Edwards (2001).

1. Flexibility, adaptability and the capacity to cope with & manage change (88%)
2. Self motivation and drive (88%)
3. Analytical ability and decision making (75%)
4. Communication and interpersonal skills (75%)
5. Teamworking ability and skills (63%)
6. Organisation, planning and prioritisation abilities (50%)
7. Customer focus and service orientation (25%)
8. Ability to innovate (25%)
9. Mental and physical resilience (25%)
10. Leadership ability (25%)

Virtual attributes required to generate an income in 2005. From Gow and McDonald's (2000) Australian survey of 127 employers and 84 educators.

Factor 1 Adaptability to changing work environments

- Create and envision new ways
- View change as opportunity
- Network to create new business
- Demonstrate willingness to *work with* diversity
- Learn in a range of environments
- Trust processes rather than structure
- Possess awareness of the need to develop networks of contacts
- Demonstrate tolerance for ever changing environments
- Respond quickly to change
- Show willingness to take risks
- Explore new ideas and resources
- Identify the best personal learning strategy and style
- Tolerate diverse viewpoints
- Demonstrate motivation
- Strive for continuous self-development
- Work with people from diverse backgrounds
- Take responsibility for career development
- Self-direct behaviour and operate independently
- Market oneself and one's ideas
- Responsibly challenge existing procedures and ideas
- Learn and perform multiple tasks

Factor 3 Accountability

- Exercise a sense of responsibility and accountability
- Value own skills and services
- Meet deadlines
- Show personal values and ethics in the workplace
- Recognise and report hazards in the work place
- Maintain a satisfying personal life
- Monitor and correct personal performance
- Handle complaints
- Give and receive feedback
- Cope with stress and tension

Appendix D. Example of using a mapping tool to develop systematic knowledge about PDP learning process : map of the University of Essex skills Award

http://www.essex.ac.uk/esa/EssexSkillsAward/gaining_esa_p1.htm

Contexts for Recording Learning and Achievement

Subject, programme/module, personal tutor system, whole institution, extra-curricula work experience, community service, other

University-wide scheme. Embraces academic courses, extra-curricula activities and work experience.

Level undergraduate/postgraduate

Undergraduate

Type of record (paper/electronic/other)

Recording devices hosted by web site as downloadable forms.

Does the record result in an award or certificate? Who owns it?

Essex Skills Certificate.

If the recording process is embedded in a curriculum **who is responsible for delivering and supporting it?**

Careers Unit

Who is involved in the construction of the record?

Students create a portfolio

How is it used?

Students attend a minimum of five courses from ESA programme Students Union Get Ahead programme.

Does it prompt dialogue between students, tutors, others?

Assessment

It is formally assessed for an award through submission of portfolio and oral presentation to three member assessment panel.

Summative assessment for credit?

Is it assessed formatively to aid learning?

Content (does it include a prescribed list of skills or a profile?)

Embraces six key skills – Communication, Working with Others, Information Technology, Numeracy, Problem Solving and Improving Own Learning and Performance.

Does the record connect to the programme learning outcomes?	No
Does it include? A course/module map eg title, credits, marks Self-audit/self-evaluation	No Students assess their current ability level – on-line audit tool an guidance ProFile and Key Skills on-line provided.
Recording past and current experience	No
Reflection on experience and identification of learning	Students produce a statement describing what they did to learn in the context of their action plan.
Action planning	Yes – students set three development targets in each of five skills areas and plan how to achieve them.
Review and evaluation of actions	Yes
Evidence of learning	‘Improving Own Learning and Performance’ statements within the portfolio enable students to describe their learning experiences and learning gains from participating in courses.
Resources to support learning and guidance	On-line guidance
Tutor Report Form	No
What model(s) of learning underlie the recording process?	1) Notions of self-regulation taking responsibility for own development in respect of key skill areas identified. 2) Learning through reflection 3) Production of Improving own Learning statement demonstrates ability to reflect on own learning experiences and achievement commensurate with the idea of PDP.

