Cohort IV Final Report

Inter/National Coalition for Electronic Portfolio Research

Northumbria University

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Research questions

1 To what extent are measured individual changes in student learning power attributable to engagement in the PDP/eportfolio process?

2 To what extent do the seven ELLI dimensions provide a useful model for staff and student awareness and engagement with personal development and the eportfolio process?

Context of the research

The research is based in the School of Computing, Engineering and Information Sciences, subject area Business Information Systems, in Northumbria University, UK. The module under review is a second year (level 5) module. 'Personal Development Planning for IS/IT Professionals', which is offered to BSc Business Information Systems and BSc Business Information Technology students. The module aims to prepare students for the recruitment process for their one-year industrial placement (and/or for full-time employment when leaving university), and to enhance their employability by inculcating a professional attitude to the work, professional codes and ethical and legal considerations of the IT/IS industry. The learning strategy is based on the precepts of Personal Development Planning integrated with the curriculum, and evidence of student achievement is collated and assessed by means of an eportfolio.

This second year module follows on from the first year module 'Skills for Information Systems Professionals', which also uses the precepts of Personal Development Planning in the design of the curriculum, and which is delivered and assessed by means of an eportfolio.

The rationale for this teaching strategy is to encourage a deep approach to learning (Biggs 2003), and, by developing students' self-efficacy, help them become the autonomous lifelong learners necessary in the ever more complex and uncertain modern world.

Literature Review

Challenges faced by HE

With easily accessible information estimated to be increasing by more than 60% a year (Kelly 2008), the knowledge worker of today no longer has to memorise facts, but must acquire life-long learning skills – must be encouraged to learn how to learn, how to research, analyse and construct knowledge for themselves. They need to become active, autonomous learners adopting a "deep approach to learning" (Biggs 2003) if they are to thrive in a society predicated on complexity and uncertainty – they need to develop their 'learning power'.

However, the academic students who adopt this approach naturally constitute a lower proportion of the greatly enlarged student cohort than was the case a few years ago. The students to whom this approach does not come naturally need help to achieve high-level engagement with their learning. According to Biggs (2003:5):

> *"Good teaching is getting most students to use the higher cognitive level processes that the more academic students use spontaneously."*

The development of the autonomous learner – the motivated, self-directed learner who adopts a deep approach to learning - is a high educational ideal which is now more important than ever, and one which may seem more difficult than ever to achieve in these days of widening participation and increased student diversity. This transformation of the UK student population has been accompanied by a decrease in the unit of resource, necessitating the deployment of innovative learning and assessment strategies to encourage all students to become the autonomous lifelong learners society needs. The aim of Higher Education must now be something more than the achievement and testing of codified knowledge, skills and understanding.

Response to challenges

Personal Development Planning/Eportfolio

One strand of the UK government's strategy to produce a workforce able and willing to undertake lifelong learning and continuous retraining and reskilling is a renewed emphasis on learning skills and student-centred learning. In this context, the Dearing Report (1997) introduced the idea of student progress files, and in May 2000 all HE institutions were directed to establish Personal Development Planning (PDP), incorporating progress files, on all taught courses (Universities UK, 2000). This report, published by the National Committee of Inquiry into Higher Education (NCIHE), defined PDP as *'a structured and supported process undertaken by an individual to reflect upon their own learning, performance and / or achievement and to plan for their personal, educational and career development.*'

The large numbers of students involved, the personalised nature of PDP, and the requirement to document the learning journey make the e-portfolio an ideal vehicle for the delivery and recording of student progress files. The facilities offered by the e-portfolio tool can enrich the HE learning experience by encouraging students to reflect on and monitor their own learning in the course of personal development planning integrated into curricular content. In this way, PDP is neither a marginal issue nor something adding value to the HE experience, but an integral part of the learning and teaching relevant to an increasingly unpredictable world characterised by complexity and uncertainty. The nature of PDP, with its emphasis on reflection and evaluation, provides opportunities for encouraging a deep approach to learning, lending itself to a social constructivist approach. Complementing this, the use of an e-portfolio as a learning and assessment platform can allow the student to showcase a wider range of achievement

than traditional forms of assessment, as well as documenting the learning journey and providing material and opportunity for self-evaluation and reflection.

However, although the potential of the PDP/eportfolio strategy to encourage learning and develop autonomy is clear, efforts so far to evaluate its efficacy have not been conclusive (Peters 2007, Baume 2007). Proponents of PDP-based teaching and learning have therefore no 'evidence' with which to convince more sceptical colleagues of its value.

Secondly, the use of the eportfolio as an assessment tool is still regarded as slightly problematical, in that its individualistic and subjective nature does not fit naturally into a system which demands strict marking schemes and clear inter-rater reliability. If a proportion of the 'marks' are to be allocated to 'personal development', what is it that is being evaluated, and how can it be assessed?

The Effective Lifelong Learning Inventory (ELLI)

In response to the growing realisation that the instrumental approach to learning and teaching which has dominated formal education – an approach consisting of, typically, codified curricula and high stakes assessment in the form of tests of knowledge, skills and understanding – was no longer relevant to the needs of the modern world, a need was identified for an assessment tool which was

"..*concerned with something more than measuring performance and achievement"*

(Deakin Crick et al, 2004)

A rigorous empirical study with school age children (Deakin Crick et al) resulted in the formulation of seven theorised dimensions of learning, subsequently described in a polarised form as seven dimensions of learning 'energy' (Appendix 1). A online Likert-scale type of questionnaire was developed which when completed gives the student and tutor a graphical 'spider's web' representation of current learning power (Fig 1).

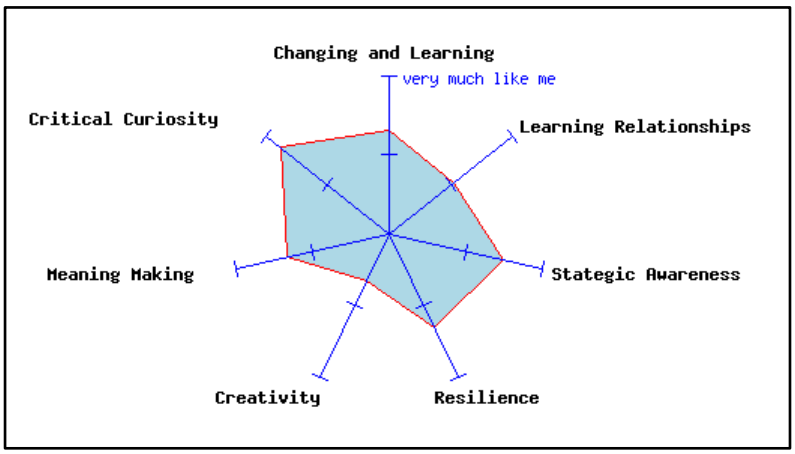

Figure 1: Example ELLI results graph

In 2006, the Leitch Review of Skills (HMSO 2006) pressed universities to lead in making the UK a world leader in delivering skills for work, again reminding HE of the inadequacy of codified curricula to meet the constantly changing needs of the modern global workplace. Staff in HE already implementing PDP to address these challenges recognised the potential of ELLI to both enrich the learning experience and provide a

means of evaluating its effectiveness. A very successful pilot project of ELLI in HE took place between March 2007 and October 2008 (Small and Deakin Crick 2008), indicating (among others):

- ELLI applicability to a wide range of HE contexts including work-based learning and PDP

- Potential to raise awareness of self and others as learners, stimulate positive personal changes and improve learning relationships

- Some students self-critical at first in response to their profiles, and then have a positive determination to improve.

Continuing research into the connection between ELLI and student achievement in the course of a collaborative project involving 5 HE institutions, lead by Northumbria University, has established a very strong correlation between 2 of the Elli dimensions, Critical Curiosity and Changing and Learning, and high student achievement. Strategic Awareness also showed a positive correlation to high achievement, although not statistically significant.

Our PDP/Eportfolio Project

Our case-study research project for the Inter/National Coalition uses ELLI for two main purposes:

1 To engage students with the concept of 'learning to learn' and to provide them with a vocabulary to discuss their learning and reflect upon it.

2 To provide a means of 'measuring' changes in student learning power and correlating these changes to engagement in the PDP/eportfolio process.

Methodology

A mixed-method approach – a combination of quantitative and qualitative research methods - was used to address our research questions.

The ELLI database produces statistics for each cohort in the form of a spreadsheet, giving results for each student. These can then be used to track changes over time, and were used to address the question "To what extent are measured individual changes in student learning power attributable to engagement in the PDP/eportfolio process?"

Whereas indication of changes in learning power as measured by ELLI is easy to obtain, it is more difficult to quantify 'engagement' for purposes of analysis. Both PDP and eportfolio strategies stress the importance of reflection and reflective writing to the learning process. According to Jackson (2001 p2)

> *"PDP is centred on student learning and development. It seeks to improve the capacity of students to understand what they have learnt, how and when they are learning and encourage them to monitor, reflect on, evaluate, plan and take responsibility for their own learning."*

While discussing portfolio assessment, Fernsten and Fernsten (2005 p 303) comment:

"Reflection pieces, a critical component of the portfolio, are a vital tool in the learning process, for through reflection students learn to scrutinize their own performance, come to terms with what went wrong as well as what went well, contemplate strategies to enhance their success in future work and take responsibility for their learning".

Accordingly, reflective writing was afforded a large proportion (60%) of the marks awarded for the module. Drawing on the work of Biggs and Collis (1982), Hatton and Smith (1995) and Jenny Moon (2001) a taxonomy for assessment was developed (Appendix 2), and reflective writing made an obligatory part of the eportfolio contents. Because of the personal nature of reflective writing and the commitment needed on the part of the students to produce good reflective writing, it was felt that the quality of reflective writing could be used as a proxy for engagement with the process. Analysis was therefore carried out to determine whether changes in the measured learning power of the students were mirrored by their reflective writing marks.

Students completed the ELLI questionnaire at the beginning of the module, then again at the end, and average scores were compared to monitor changes. The cohort was then divided into above and below average reflectors, and their ELLI scores were compared, this time taking their first year scores with their second year ones. To check that it was not just the academically gifted students who were showing engagement in this way, the UCAS[1] scores of a convenience sample of the cohort (those whose pre-university records were easily accessible) were correlated against their reflective writing marks.

However many statistics we can collect, we cannot prove causality. A more effective method of gauging the impact of ELLI on learning is probably a qualitative one. To address our second research question – "To what extent do the seven ELLI dimensions provide a useful model for staff and student awareness and engagement with personal development and the eportfolio process?" – students' reflective commentaries were analysed for words and phrases which indicate that the students were thinking about their learning in terms of the ELLI concept. We were not looking for the actual vocabulary employed in the ELLI literature, as that may indicate 'parroting' without engagement. An ELLI 'thesaurus' (Appendix 3) was created to categorise reflective statements so that we could assess which of the dimensions the students were most aware of.

Findings

Quantitative

1 Comparison of the average 'before' and 'after' scores showed an increase in most dimensions (Fig 2), including those indicated by new research at Northumbria as showing a positive correlation to high achievement – Changing and Learning, Critical Curiosity and Strategic Awareness.

2 The results of the comparison between successful reflection and ELLI scores could indicate one of the reasons for the increase in learning power shown by some students (Fig 3). Here, the successful reflectors, who we consider as showing engagement with the PDP/eportfolio process, are shown to increase their learning power in the important dimensions of Changing and Learning, Critical Curiosity and Strategic Awareness, while those who have not engaged have registered a decrease in these areas.

[1] Universities & Colleges Admissions Service – awards points for academic achievement pre-HE; usually, the higher the score, the more academic the student.

3 Correlation of UCAS marks against reflective writing marks showed a weak correlation (- 0.11487), and while the small numbers involved in this correlation prevent any conclusions being drawn from this, this result is in keeping with the results obtained from a similar exercise with the whole first year cohort in a previous year.

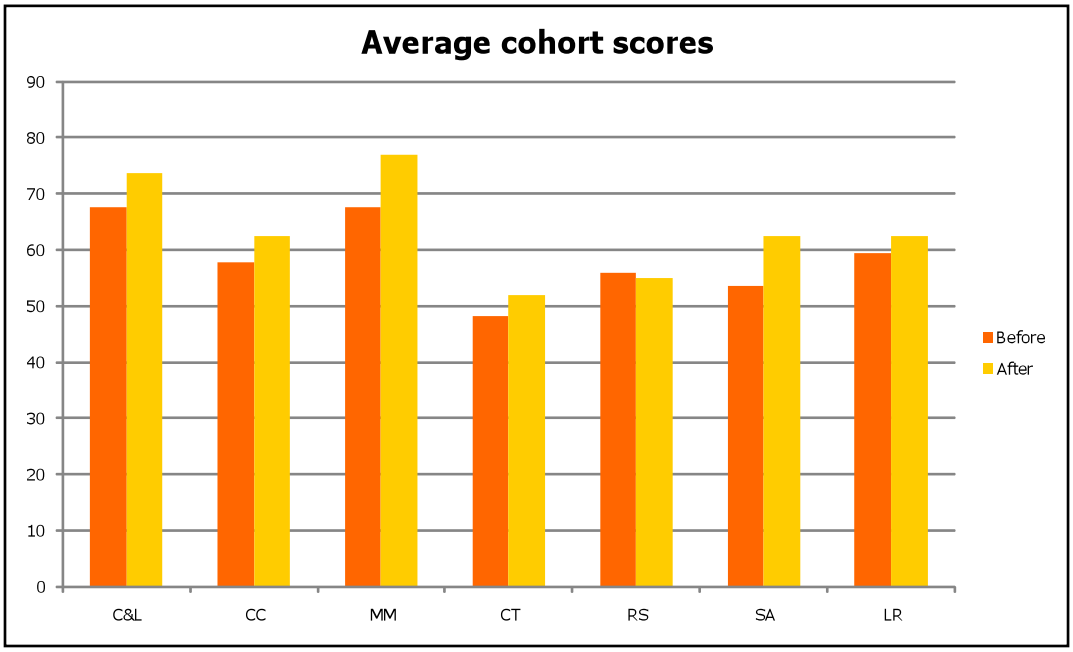

Figure 2: **Comparison of average ELLI scores at beginning and end of the module**

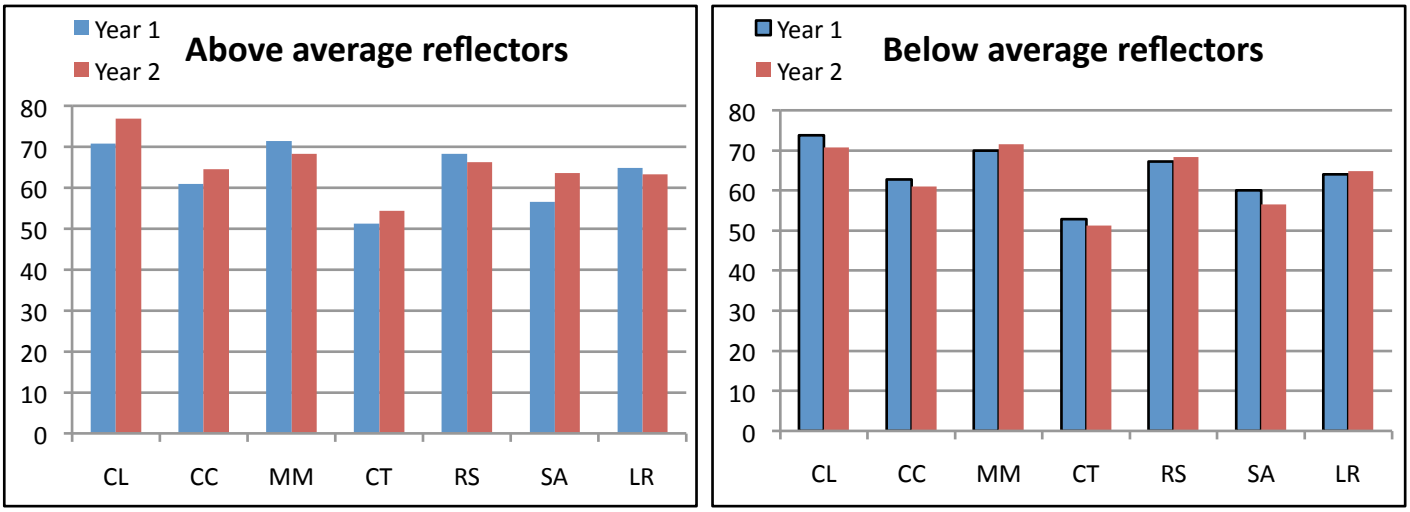

Figure 3: **Changes in learning power over one year shown against ability to reflect**

Qualitative

Most students who commented on the ELLI experience reported that it was a helpful learning tool. Although it is more than likely that some of these students were using their 'Strategic Awareness' to say what they thought their tutor wanted to hear, analysis of the reflective commentaries showed that many students were becoming aware of

learning as a process, as a skill that could be consciously improved with practice, as the following student quotes show:

"The E-Portfolio format also encourages not only to complete a task, but to analyse and improve it according to feedback obtained by peers."

"I have realised how important it is to reflect upon, and not forget about previous learning.."

"By going back and reviewing your work you find places that you could do better.."

"..enabled me to reflect on past experiences and learning lessons from those experiences."

"What's more I feel that I am actually learning, as I am revisiting work and constantly refreshing my knowledge, unlike my previous experiences where I learn a subject off by heart until it is over then forget it almost instantly"

"With the graphical demonstration of my 'learning power' I was intrigued into discovering more about the seven dimensions of 'learning power' and therefore feel that the profile was very useful in improving my understanding of the topic."

"At first I didn't see the point in doing the questionnaire but once I had time to reflect on it I decided it could be used as a took [sic] which could help me improve the kind of learner I am. Now I would recommend it to anyone in education, not just university. If you are dedicated and willing to improve the type of learner you are this is one of the most helpful tools you will find."

The influence of the ELLI dimensions could also be seen in their reflections on the mock interview process which formed part of the module, for example:

"I enjoyed relating what we had learned about in lectures such as communications through body language and attitude to real life situations." (Critical Curiosity)

"I still need to slow down when talking and I felt my answers were too scripted and need to sound more off the cuff" (Changing and Learning)

"I looked at what the company had specified as their main needs and tried to link my personal experience to their requirements". (Strategic Awareness)

Our analysis of students' reflective writing indicates that ELLI constitutes a very useful way of increasing awareness of the PDP/eportfolio aims. Its novelty arouses curiosity, and its vocabulary helps students and staff to articulate their thoughts about learning itself, leading to deeper engagement with the PDP/eportfolio process.

Implications

This design and implementation of PDP/eportfolio learning strategy is unfamiliar to most students. Most secondary education does not promote independence in learning (McCarthy 1998), and students arrive in university unequipped to take control of their own development. They have no experience of self-evaluation, and lack the vocabulary to discuss and reflect on the actual learning process. They need, therefore, instruction and encouragement to adopt this way of learning; their learning journey to self-efficacy and autonomy needs 'scaffolding'.

The results of this project, although in no way conclusive, indicate that the Effective Lifelong Learning Inventory can provide valuable help in increasing engagement in the PDP/eportfolio process. Although it can be used to indicate the effectiveness of a learning strategy, there are too many variables in any academic situation to prove a causative link. Its main benefits in the PDP/eportfolio process would seem to be its ability to arouse interest in the learning process itself, to indicate that learning is a skill which can be consciously improved, and to provide a vocabulary with which to discuss and reflect on personal development.

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Appendix 1

Seven dimensions of learning energy

Growth orientation

Some learners appear to regard learning itself as learnable. They believe that, through effort, their minds can get bigger and stronger, just as their bodies can. They see learning as a lifelong process, and gain pleasure and self-esteem from expanding their ability to learn. Having to try is experienced positively: it's when you are trying that your `learning muscles' are being exercised. A growth orientation includes a sense of getting better at learning over time, and of growing and changing and adapting as a learner in the whole of life. There is a sense of history and hope. The opposite of growth orientation is fixity. Other learners appear to believe that the ability to learn is fixed. They therefore experience difficulty negatively, as revealing their limitations. They are less likely to see challenging situations as opportunities to become a better learner.

Critical curiosity

Some learners manifest a desire to find things out. They like to get below the surface of things and try to find out what is going on. They value `getting at the truth', and are more likely to adopt `deep' rather than `surface' learning strategies. They are less likely to accept what they are told uncritically, enjoy asking questions, and are more willing to reveal their questions and uncertainties in public. They like to come to their own conclusions about things, and are inclined to see knowledge as a product of human inquiry. They take ownership of their own learning and enjoy a challenge. The opposite pole is passivity. Passive learners are more likely to accept what they are told uncritically, and to believe that `received wisdom' is necessarily true. They appear to be less thoughtful, and less likely to engage spontaneously in active speculation and exploratory kinds of discussion.

Meaning-making

Some learners are on the lookout for links between what they are learning and what they already know. They get pleasure from seeing how things `fit together'. They like it when they can make sense of new things in terms of their own experience, and when they can see how learning relates to their own concerns. Their questions reflect this orientation towards coherence. They are interested in the big picture and how the new learning fits within it. They like to learn about what really matters to them. The opposite pole is fragmentation. Some learners are more likely to approach learning situations piecemeal, and to respond to them on their own individual merits. They may be more interested in knowing the criteria for successful performance than in looking for joined-up meanings and associations.

Dependence and fragility

Dependent and fragile learners are more easily disheartened when they get stuck or make mistakes. Their ability to persevere is less, and they are likely to seek and prefer less challenging situations. They are dependent upon other people and external structures for their learning and for their sense of self-esteem. They are passive imbibers of knowledge, rather than active agents of their own learning. The opposite of dependence appears to be resilience & robustness. Learners with these characteristics like a challenge, and are willing to `give it a go' even when the outcome and the way to proceed are uncertain. They accept that learning is sometimes hard for everyone, and

are not frightened of finding things difficult. They have a high level of `stickability', and can readily recover from frustration. They are able to `hang in' with learning even though they may, for a while, feel somewhat confused or even anxious. They don't mind making mistakes every so often, and can learn from them.

Creativity

Those learners who score highly on this dimension are able to look at things in different ways. They like playing with ideas and taking different perspectives, even when they don't quite know where their trains of thought are leading. They are receptive to hunches and inklings that bubble up into their minds, and make use of imagination, visual imagery and pictures and diagrams in their learning. They understand that learning often needs playfulness as well as purposeful, systematic thinking. The opposite pole is literalness or rule boundness. These learners tend to be less imaginative. They prefer clear-cut information and tried-and-tested ways of looking at things, and they feel safer when they know how they are meant to proceed. They function well in routine problem-solving situations, but are more at sea when greater creativity is required.

Relationships/interdependence

Learners who score highly on this dimension are good at managing the balance between being sociable and being private in their learning. They are not completely independent, nor are they dependent. They like to learn with and from others, and to share their difficulties, when it is appropriate. They acknowledge that there are important other people in their lives who help them learn, though they may vary in who those people are, e.g. family, friends or teachers. They know the value of learning by watching and emulating other people, including their peers. They make use of others as resources, as partners and as sources of emotional support. And they also know that effective learning may also require times of studying - or `dreaming' - on their own. The opposite pole is dependence. Some learners are more likely to be stuck either in their over-dependency on others for reassurance or guidance; or in their lack of engagement with other people.

Strategic awareness

Some learners appear to be more sensitive to their own learning. They are interested in becoming more knowledgeable and more aware of themselves as learners. They like trying out different approaches to learning to see what happens. They are reflective and good at self-evaluation. They can judge how much time, or what resources, a learning task will require. They are able to talk about learning and about themselves as learners. They know how to repair their own emotional mood when they get frustrated or disappointed. They like being given responsibility for planning and organizing their own learning. The opposite of `strategic' is robotic. Learners with these characteristics appear to be less self-aware, and are more likely to confuse self-awareness with self-consciousness.'

(Deakin Crick et al, 2004, pp254-256)

Appendix 2: A TAXONOMY FOR THE ASSESSMENT OF PDP/ePORTFOLIOS (Applied to a 2nd year employability module)

CONTEXT: BUSINESS INFORMATION SYSTEMS **MODULE TITLE**: Personal Development Planning for IS/IT Professionals	**Marks**	**SOCIO-CULTURAL ENGAGEMENT – (20%)** Awareness of and responsiveness to the requirements of the module, student cohort, and the academic community.	**Marks**	**PRACTICAL COMPETENCE (20%)** As demonstrated in the production of application documentation and performance in the practice interviews, as interviewer and interviewee.	**Marks**	**REFLECTION AND SELF-EFFICACY (60%)** Reflective language that describes, analyses and plans subsequent actions as a result of reviewing processes and events. Evidence of awareness of own knowledge, skills and competences.
LEARNING OUTCOMES By the end of this module students should be able to: 1 Use reflective practice to understand how they are learning and how to prove what they have learned, and to relate their learning to employer interests 2 Articulate their personal objectives and evaluate progress towards their achievement, while producing and continuously developing career plans 3 Produce written documents (application forms, CVs, covering letters) and presentations to professional standard and adopt a professional manner and appearance in interview situations* 4 Produce an electronic portfolio showcasing their skills and knowledge which can be shared with prospective employers 5 Use self and peer assessment techniques to evaluate their own and others' work.	16-20	Module themes addressed and evidenced by completion of required tasks to a high standard. Demonstrable peer collaboration and enthusiastic participation in group activities.	16-20	Documentation both correctly and attractively presented, and focussed on the demands of the job description and personnel specification. Performance as interviewer and interviewee well prepared and conducted professionally; interview performance showing awareness of the requirements of the post, and their own evidence of knowledge, skill and competences	41-60	Use of vocabulary, writing style and expression indicate engagement with the reflective process. Evidence of self-evaluation and awareness of wider context. Selection of portfolio contents shows good judgement and awareness of the evidence of the knowledge, skills and competences required in particular circumstances.
	11-15	Module themes addressed and evidenced by completion of required tasks to a reasonable standard. Some peer collaboration evident, and clear participation in group activities.	11-15	Documentation mostly correctly and attractively presented, and focussed to some extent on the demands of the job description and personnel specification. Performance at interview well prepared, but needing more experience to achieve professional standard. Some difficulty in presenting accomplishments to best advantage during interview.	21-40	Writing style mainly descriptive but some engagement with the reflective process. Reflection largely confined to the personal, with little attempt to connect to the wider context. Selection of portfolio contents shows an attempt to provide evidence of the knowledge, skills and competences required in particular circumstances.
	0-10	Module themes partly addressed by completion of some tasks to an acceptable standard. Very little peer collaboration evident, and only minor contributions made to group activities.	0-10	Documentation shows lack of care and/or is of unacceptable standard (would not have earned an interview). Performance at interview ill-prepared, not addressing requirements of the post. (Some allowance to be made for nerves).	0-20	Use of vocabulary, writing style and expression entirely descriptive, showing very little engagement with the reflective process. Selection of portfolio contents shows little thought or awareness of the requirements of the exercise.