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Developing Tools to Encourage Reflection in First Year Students Blogs

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ABSTRACT
The pedagogical basis of a project aimed at encouraging students to engage in reflective activities using blogs to document their learning experiences is described. It also gives some details of the practical implementation of this work. Activities which scaffold the process are discussed, together with a description of some difficulties that arise when the informal aspects of blogging conflict with the desire to use the reflective work as formal evidence of learning in a personal development portfolio.

Categories and Subject Descriptors
K.3.1 [**Computers and Education**]: Collaborative Learning.

General Terms
Design, Human Factors.

Keywords
Reflection, Feedback, Blogs, Graduate Attributes, Collaborative Learning, PDP.

1. INTRODUCTION
The use of blogs as a vehicle for Higher Education students to reflect on their own learning experience would appear to be quite promising. They provide a mechanism through which the student can express a developing, yet locally coherent, learning narrative, while interacting with feedback and commentary from colleagues and tutors. This integration of personal reflective activity with the inherently social character of blogging, as opposed, say, to maintenance of a paper-based diary or journal, is appealing from a pedagogical point of view as a means of enhancing both autonomous and collaborative learning [2].

Two aspects of the use of such blogs seem particularly attractive. They can be used to encourage the development of critical and analytical skills which allow students to reflect on their own educational experiences and can thus provide a vehicle for the articulation and documentation of personally significant insights into the learning process over an extended period of time. This type of reflective practice is a key graduate attribute linked to the enhancement of life-long learning skills and increased employability, and a demonstration of this over the period of undergraduate or postgraduate study could, for example, be seen as an important element of an electronic personal development portfolio. In addition, they provide an accessible communication forum which allows students to engage with lecturers and other students in a way which is less formal than that usually found in the classroom. This may well be used to promote the creation of social networks that support learning, while also providing a natural mechanism which facilitates the process of feedback to and from students [2].

There are, however, some problematic areas associated with the development of reflection through the use of blogging. The first is that (following Schön [11]) while the development of reflective activity is seen as particularly desirable, indeed crucial, to the process of becoming subject practitioners, students find such activities extremely difficult [6] unless provided with appropriate scaffolding around which they can develop the skills for self-analysis and reflection. The second is a significant tension between the objective of formal documentation of achievement and that of the using the technology as an immediate and relaxed communication forum. The spontaneous and informal nature of the latter often militates against the production of work which is useful for recording achievement, while, conversely, a clumsy imposition of a formal pedagogical structure can destroy factors which promote the kind of social interaction and peer-assisted learning that is seen as desirable in such situations.

This paper describes work done in an ongoing project aimed at addressing the problems indicated above. It details the pedagogical drivers, specifically those associated with feedback, which strongly recommend the use of blogs (as opposed to, say, a paper-based learning journal) as a useful vehicle for promoting reflection. It also describes some features of the system used and the academic structure in which the material used to scaffold these reflective activities was embedded. In addition, it makes some comments about the difficulties of using blogs for recording competence, while remaining environments for opportunistic learning, retaining the element of spontaneity and informal social interaction which make them attractive to students. Finally, some observations concerning the wider positive lessons of the project are made.

2. BACKGROUND - WHY USE BLOGS?

A recurrent criticism, detailed, for example, in the results of the UK National Student Survey [8], is the significant disparity between student expectations of academic feedback and the reality of their educational experience. At the same time, the SENLEF project [4], reporting on the use of feedback and 'feedforward' techniques to enhance student learning, suggests that the conceptual complexity of constructively responding to student work has itself been underestimated, by both teachers and students alike. It is generally accepted that the feedback process serves a number of purposes, related both to the specifics of the assessment to which it is a response, and the more general educational experience in which the teacher and student are engaged. However, this still often leads to confusion when academics use the term in one sense (e.g. as informal reporting on classroom exercises) and students understand it in another (e.g. as formal outcomes of summative assessment).

2.1 Evaluation Criteria for Good Feedback

Rather than give a comprehensive definition of a good assessment or feedback practice, some researchers have attempted to give practical descriptions of the types of features that should characterise its implementation, along with the pedagogical justification for the chosen criteria. Among these are the principles' developed by Nicol and his coworkers (see [4, 9] and references therein) which have informed a range of activities funded by the UK Higher Education Academy notably the SENLEF [4] and REAP [10] projects. These principles address the dual purposes of providing information to stakeholders about the learning process while at the same time encouraging a range of behaviour which promote learning. The underlying premise is that assessment and feedback practices should be judged by the extent to which they support the fundamental goal of learner self-regulation. The principles, therefore, provide a set of criteria which can be used by academics to assess whether a particular practice is effective. In terms of providing information to stakeholders, for example, the feedback should, on the one hand, help students clarify the nature of 'good' performance' while providing appropriate information to allow them to relate their own performance to this standard. For teachers, it should provide the information needed to shape and improve subsequent activity. Feedback should also serve to inform the student's cognitive awareness of the learning process in order to promote constructive behaviour. This includes facilitating the development of self-assessment and reflection, as well as empowering the student to take ownership of the nature of, and decision-making processes surrounding, the assessment practices. Furthermore, this cognitive development should lead to improved affective behaviour such as improved motivation to learn and greater time-commitment to study. Finally, good assessment and feedback should promote the social or collaborative aspects of learning such as interaction among students, and between students and teachers, and the development of learning communities.

The principles can therefore be used to review the assessment and feedback mechanisms used in a particular academic programme and they provide sensible pedagogical underpinning for the development of robust feedback practices when used in the context of a curriculum design.

2.2 Using Blogs to Provide Good Feedback

In looking for a vehicle which would allow both students and staff to engage with the pedagogical criteria articulated above, the idea of some form of learning journal (whether paper-based, electronic, or simply a set of discrete reflections on learning) has several important features that recommend it. Since a primary goal is the development of self-assessment and reflection, a reflective journal is clearly a strong candidate. Learning by making best use of feedback requires the student to develop a capacity for critical self-analysis. This requires that activities be structured so as to allow the students themselves to monitor their own progress with respect to assessment objectives and to reflect on different aspects of the learning experience. According to [4, 10], examples of such structured reflection might include activities in which students are given a set of grading criteria and asked to identify strengths and weaknesses in their own work or in those of their peers. Alternatively, they could be asked to make careful attempts to select a set of appropriate examples of good work in order to compile a portfolio. In both cases, emphasis is placed on analysis of work and the selection and presentation of suitable material.

It is, however, the specifically social features of blogs, over and above paper-based journals, that provide the strongest recommendation for their use in trying to facilitate teacher and peer dialogue about learning. Work by Hatton and Smith [7] suggests that interaction with 'critical friends' is a beneficial factor in promoting reflection. The commenting feature of a blogging environment affords a mechanism which easily allows both teachers and students to give feedback on a piece of work. Moreover, explanations of difficulties from peers may well be articulated by other students at a more appropriate level and be perceived as less of a threat to self-esteem. Peer feedback also has several advantages in terms of the alternative perspectives it may present on a problem and the different strategies used for its solution. This can serve to both motivate perseverance in challenging tasks and provide a degree of support and validation for efforts made [3].

In an academic context, this interplay between social support and formal academic instruction serves to make the blog a powerful element in the construction of peer mentoring systems. However, the practice of making comments on work done by their colleagues also prompts students to develop the capacity to make objective evaluations of submitted material with reference to externally-set marking criteria, something which can then be transferred to self-appraisal of their own work. This ongoing student-teacher and student-student dialogue also serves to clarify the more subtle (and often unstated) characteristics of what counts as "good performance" in the context of a particular assignment. This process of the monitoring, by the student, of the gap between their own understanding of high performance and that of the teacher and their peers is crucial to the development of a sophisticated understanding of the learning process. Moreover, the repetitive nature of tasks like blogging also increases time-on-task and allows students to iterate the feedback cycle in a natural way.

The use of commentary to provide feedback which empowers students to discern the strengths and weaknesses of their performance is clearly advantageous to the learning process (provided it is given in a timely manner) since this gives students

the opportunity to exercise judgement in how they may subsequently modify their own work and so increase their self-direction. This link between successful reflective practice and increased learning autonomy suggests that blogs may be used profitably to encourage the student to understand of the notion of developmental improvement and so realise that the relationship between one's current state of knowledge and the established subject matter does indeed evolve and deepen over time.

Finally, blogs give a useful two-way feedback mechanism which allows students to themselves offer commentary on the provision and suitability of teaching activities in which they are being asked to participate. They can therefore be used to provide high quality information to teachers about the nature of the student experience. This may go well beyond academic concerns and offer insights into the social, economic and intellectual milieu of the student which may, for example, affect the way in which the course is delivered or simply increase the teacher's appreciation of the (variety of) student experiences.

3. IMPLEMENTATION

This investigation was carried out in the context of the first year of the computing programme at the Robert Gordon University, Aberdeen, UK. This programme takes about 80 students from a wide range of academic and professional backgrounds and offers a number of different routes ranging from a standard hardware and programming based Computer Science degree to less technical Business Information Systems degrees. It also includes students on more specialised routes such as Computing for Graphics and Animation, and Internet and Multimedia. All students are, for the most part, taught in common for the first two semesters, and thereafter the routes diverge significantly. First year students study three thematic areas: software development, information systems and problem-solving. Each of these technical modules is taught over two semesters and contributes 30 credits to a 120 credit total. An additional 15 credit technical module, depending on the nature of the student's chosen degree, is taught in the second semester. The remaining 15 credits is made up of the Collaborative and Professional Skills module, taught over two semesters to all computing undergraduates.

The work described was embedded in this latter module, the extended duration of which meant that there was considerable flexibility in terms of the types of activities that could be included as the basis for reflection.

3.1 Activities

Two kinds of task formed the essential student activity of this module. Firstly, each student was required to keep an individual blog and post a minimum of two hundred words on each technical module per week describing their learning experience. It was envisaged that this would form part of an e-portfolio of work which would accompany the student throughout their course of study and could, potentially, form the basis of further reflective activities in later years. In addition to posting their own reflections, there was a requirement that they make a substantive comment on two other posts each week and time was set aside in class to allow for these activities. The academic goals of the blogging activity were carefully explained to students and a default template for the presentation of reflective comments was distributed providing some basic scaffolding for these exercises. This consisted of a number of questions in which the student was asked to identify the major learning objectives covered that week, detail new information or skills which had assimilated, comment on any learning strategies adopted, and describe any affective reactions to the classes the student had experienced.

Research has shown (e.g. [5, 7]) that, despite widespread academic belief about the importance of reflection in learning, the majority of students find such activity difficult to practice. Furthermore, teachers frequently find it difficult to promote. For the student, this may be due to the fact that the ability to reflect is learned slowly over a period of time, but it also appears that, often, activities which are designed to promote the skill lack focus. The second kind of activity attempted to provide structured opportunities to develop and enhance the kind of skills now being termed 'graduate attributes' (see e.g. [1]). These include the ability to exercise critical thinking, to access, evaluate and synthesise information, to communicate effectively, to work successfully both independently and in teams, and to demonstrate leadership, professional behaviour and ethical practices.

The initial module exercises were discursive in nature and focussed on the purpose of the module and the idea of graduate attributes (over and above subject-based technical competencies). These were then followed by an introduction to the computing infrastructure relevant to the module, e.g. the blogging environment. Further activities engaged with issues in the psychology of learning. The Hatton-Smith categorisation of reflective writing [7] was also described.

In order to assess the effectiveness of different ways of delivering instructions, the scaffolding required for reflection was presented in a variety of forms: verbal instructions given with the task itself, specific written instructions given with the task, and general verbal instructions about documenting reflection in the context of a learning journal.

3.2 Implementing the Blogging Environment

A number of implementation decisions were required before the system could be set up, the most immediate being the hosting context. In this particular case, because of institutional concerns over the possibility of on-line antisocial behaviour, it was decided that the blogs would be hosted internally. This provided a comprehensive degree of access control that was not possible with externally hosted systems and the capability, in the worst-case scenario, of simply shutting the system down.

A second decision concerned the level of sophistication of the implementation. Blog creation facilities on external sites such as Blogger, or professional development tools such as Wordpress, have a range of features including a variety of design templates, as well as the ability to integrate with an array of applications such as RSS feeds. While incorporation of these may well be important for long term development of the module content, they can serve to distract attention from the pedagogical goals of the exercise and consequently it was decided to use a minimal implementation of a blog based on the Drupal content management system. This provided an environment in which it was possible to display and comment on blog posts, but it could also act as an electronic repository of work and so form the basis of an e-portfolio system.

It was decided at an early stage to make the student contribution compulsory by embedding the blogging activity within a module which required some degree of student participation in order to pass. This allowed a degree of assessment to be placed on the activity which served to increase its importance as perceived by students. Finally, throughout the duration of the first year, it was stressed that the medium itself could also be used for more informal purposes such as a forum for debate about issues surrounding the first year experience.

The blog posts themselves were not anonymous, although the identifier was the student matriculation number rather than the name. However, as this was hyperlinked to a profile page with personal details, there was little doubt about the authorship of any particular post. Students did have the option to make posts private or public. If the post was private, the material would only be visible to the author and members of academic staff whereas if the public option was chosen, the material would be visible to all users. As well as being placed in the student's own blog, a copy of a public post was put into the Community blog which aggregated all public posts and indicated, for example, if a new post or a new comment had been made. Despite some initial fears that students would be reluctant to allow others access their posts, all students chose to make all posts public. Posts themselves were required to be tagged with a minimal set of information (matriculation number of poster, module code of subject) but the student could include any suitable tag. This information was displayed on the System homepage as a tag cloud using a variable-size font.

4. RESULTS

The primary academic measure for this project was the degree to which students exhibited increased confidence in their ability to self-regulate their learning. This was investigated in two ways. The first was an examination of data recording student confidence in the demonstration of the three key attributes: critical analysis of arguments, reflection on their own work and academic writing skills, as well as confidence in their ability to engage in self-assessment and peer-assessment. The second was an analysis, at a number of points in the academic year, of the reflective content of the blogs themselves.

The main tool used to establish the degree of student confidence was a set of questionnaires, distributed at the end of each semester. These investigated the academic expectations and aspirations of students, as well as their level of confidence at coping with the academic and social pressures of the first year of undergraduate study. They also allowed students to comment on perceived progress over the course of the first semester. These surveys were used in conjunction with an initial questionnaire distributed at the very start of the academic year.

Results over the first and second semester are shown in figure 1 below. The response rate (out of 82 in the cohort) was 81% for semester 1 and 72% for semester 2. The graph illustrates the percentage response, on a five-point Likert scale, for confidence in each of the aforementioned self-regulatory skills. The fraction of students responding positively (i.e. very confident or quite confident) increased in each category apart from that of academic writing, where it remained roughly the same.

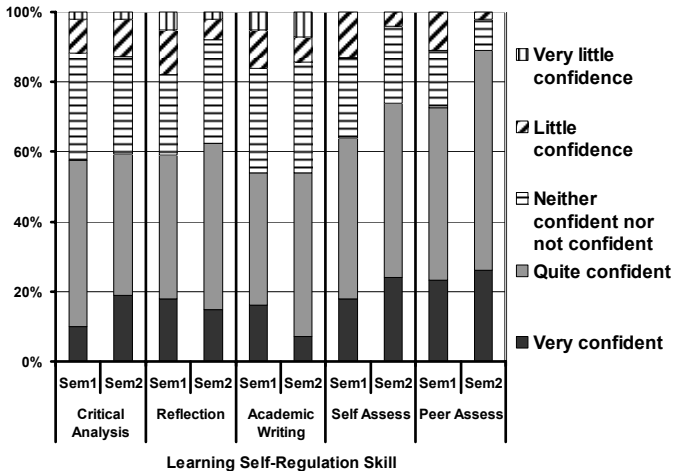


Figure 1. Comparison of end of semester student responses

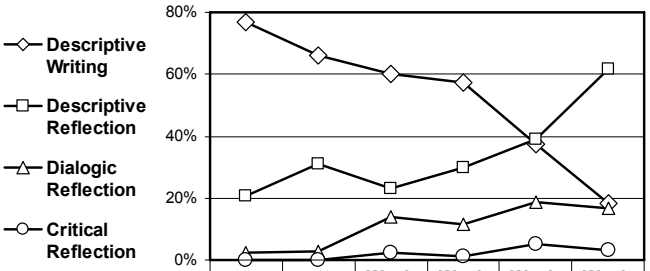
Continuous formative feedback was given throughout the year (in the form of staff comments on student posts) and it was decided that there would not be summative assessment of the reflective work produced by the students. Nevertheless, blogs were reviewed using the Hatton-Smith framework which classifies writing into four levels of increasing sophistication of reflective activity. The initial stage is descriptive writing. This is essentially non-reflective - it simply describes experience without attempts at analysis - but can nevertheless serve as a foundation for later, more complex activity. This is followed by descriptive reflection in which the student attempts to provide reasons for their learning experiences based upon quasi-reflective personal judgements. The third stage is dialogic reflection in which the student enters into a personal discourse to explore possible reasons for observed outcomes. The final stage is critical reflection, which, in this context, was taken to be demonstrated by the elaboration of reasons for personal learning decisions and experiences which takes into account a mature understanding of the psychological and pedagogical factors affecting the learning process.

Analysis of the reflective content of student blogs was done by classification of all blog content submitted at six stages throughout the year: weeks 2, 8, 12, of semester 1 and weeks 4, 8 and 12 of semester 2. The first of these was chosen to provide a baseline while the remaining weeks followed significant assessments in the technical modules (which provided source material on which to focus the reflective activity).

The data in Figure 2 below indicates that there was some improvement through the reflective hierarchy throughout the year. Most students started at the descriptive writing stage and progressed to descriptive reflection with a number of students regularly engaging in dialogic and even critical reflection. Comments from the questionnaires showed that a majority of students felt positively about the need for reflection. Moreover, they also suggested that student satisfaction concerning feedback was also positive, contributing to increased satisfaction measures with course as a whole.

A number of issues emerged, most of which illustrate to varying degrees, the unpredictability of effects of the technology. The students quickly colonised the virtual space for their own use, setting up threads for discussion of non-academic topics (movies,

music, etc) and this may well have influenced their perception of the medium when it came to using it for academic purposes. It became evident that although teachers saw a distinction between student use of blogs to foster activities such as peer support or engagement in discussions about their learning experience on the one hand, and the PDP-like tasks of recording reflections to illustrate conceptual growth on the other, students did not reflect this difference in their work, using similar standards for presentation and content in both. The use of written language, for example, in any task with a social dimension (even if it was directed towards a conventional academic activity) remained resolutely informal, with a high frequency of SMS-style posts lacking conventional grammar and punctuation. This problem was persistent throughout the year and providing students with templates for their responses was only partially successful in eliminating this behaviour. This strongly suggests that considerably more attention to this issue is necessary if the primary goal is recording achievement.



	Week 2	Week 8	Week 12	Week 16	Week 20	Week 24
Descriptive Writing	77%	66%	60%	57%	37%	18%
Descriptive Reflection	21%	31%	23%	30%	39%	62%
Dialogic Reflection	2%	3%	14%	12%	19%	17%
Critical Reflection	0%	0%	3%	1%	5%	3%

Figure 2. Classification of blogs posts

A second concern was that, while a majority of students engaged substantively with the medium (even if they did not necessarily use it in the way that had initially been anticipated), there remained a small number of students who failed to contribute anything above a descriptive level. Some of these students stated that they did so because they saw no personal benefit in the reflective activity itself. Others indicated that, while they used social software such as Facebook in a non-academic setting, their lack of participation was a reaction against the minimalist implementation which, they felt, militated against contribution.

5. CONCLUSIONS

Despite these occurrences, the majority of students engaged with the blogs in ways which elicited positive student feedback and were educationally constructive. Many students chose to interact with the medium from outside the university in the early hours in the morning. While the quality of the writing in the blogs may have, at times, been somewhat basic, it nevertheless represented the initial stages in a process which was projected to continue throughout the student's undergraduate career.

One notable aspect of the project, however, was the response of academic staff. All tutors involved in the project reported that the experience of reading and commenting on the student blogs had been overwhelmingly worthwhile due to the quality of the information gleaned on the student learning experience. The day-to-day reportage of first year experiences, of issues surrounding teaching styles and lesson content, problems with lab exercises, and assessment difficulties, as well as non-academic issues such as finance, was found by staff to be an invaluable source of feedback which allowed them to better tailor subsequent lessons to the concerns of the students. The medium allowed the initiation of a mature dialogue about topics such as the relevance of parts of the curriculum, and encouraged the formation of both academic and social peer support structures among the students.

Perhaps the most significant feature of the blogs from a staff perspective was that, even for experienced teachers, it opened a window on the student experience which generated much greater empathy for the routine problems and challenges that students faced. This fact was acknowledged by students and has been a major contribution to the socialisation of the classroom which has improved the general working environment of both academics and students alike.

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