11 The Autonomous learner?

…free to explore, to create and to feel …

(Clynes and Kline)

Connections

Observations of young people at work with computers, conversations with them and the assessment and analysis of their coursework led me to believe that a fundamental shift had taken place in their approach to work. They no longer saw the structured, linear approach that characterised their lessons as appropriate to them. Further, their conceptualisations of Mind, and the ways in which they perceived the thinking process, suggested that this method of work might not be as ad-hoc as many of us had thought.

Conventions

This research identified a working style used by students analogous to that described as 'bricolage' by Levi-Strauss. This method of working, 'pre-scientific' in Levi-Strauss' view, may well be one that has been intuitive to young people before being supplanted by the systematic, structured method of the education system.

This structured and sequential model, devised, administered and validated by adults, has traditionally imposed itself on that of children. Within this system, success has been measured by the way in which learners have

matched those patterns expected by their teachers: adults. In order to succeed, therefore, the learners have had to adopt the systems and patterns expected of them. National Curriculum testing, GCSE and the plethora of post-16 examinations are all dependent upon students generating the outcomes expected by examiners.

Assumptions

The 'developmental folk myth' which informs many teachers' praxis, based upon the popularisation of Piagetian theory, expects learners to pass through a series of stages, each predicating its successor. This praxis contains two pillars of received wisdom: learner readiness, and stage competence. What this means for students is that, first, they are not expected to be able to cope with concepts and applications which have been determined to lie outside the bounds of their developmental stage: second, that each stage needs to be consolidated by practice.

Much of Piaget's research took as its focus the growth of mathematical and scientific concepts. Children's ability to understand the tasks which they were set, and to explain them in appropriate terms, was taken as a demonstration of their competence: the language encoded the 'scientific' expectations imposed on the children. The methodology and findings have been questioned by a number of researchers (Donaldson, 1978; Gardner, 1983, 1993; Seigel and Brainerd, 1978) but the original thesis still retains its power over pedagogy, teacher attitudes and the curriculum for schools in this country.

Broad stages of learning

The broad stages of the learning paradigm can be summarised as those of learning about; practising and applying. The model is very much one of an apprenticeship, with the teacher (and adult) in the role of the master and controller, who is also the assessor of success and competence. The ultimate arbiter and guarantor of success is the state, through its networks of control over schools, examination boards and universities.

The content and form of learning is therefore both constructed and legitimated in academic and social terms. The application of league tables as an apparently neutral scale against which success and failure can be measured is used for the whole of the education systems, whether state or independent, nursery school or Oxbridge college. The debate over standards is one which is externally imposed on the system, with the students as learners constantly scrutinised to determine whether or not their successes are real or the product of an academic inflation that results in a devaluation of the currency. Concurrent with this is the constant scrutiny of the curriculum, to determine whether the cultural capital upon which the students are presuming to trade is genuine or counterfeit, and whether or not Media Studies is as 'real' a subject as Physics and Mathematics.

New realities

Students use their computers as far more than electronic typewriters. The practice of bricolage observed among, and described by, so many students during the course of this study is made possible because of the infinitely flexible tools of hardware and software which they use. These tools become more powerful with each update of existing software and the addition of new. Students seek out downloads of new software in its beta testing format, accepting the instability and glitches built into the system in order that they can try new possibilities. Each addition to their toolbox calls upon new working strategies and new ways in which to learn how to make things work together.

New ways of learning

These cyber-bricoleurs constitute a new knowledge community. Its members are all those who use ICT in innovative ways: adult mentors from work placements; teachers whom they feel are in touch with the latest developments; email correspondents but, most of all, other students. The knowledge pool consists of 'know-how', which constantly renews itself: it is practice, which creates new ways of doing things. It is precisely because of

this constant renewal that the knowledge community is separate from that of most teachers.

The knowledge that is constructed is not achieved through linear, sequenced steps. Indeed, it is not achieved by 'chunking' in its accepted sense, since chunking is a concept based on pre-determined structures and stages. Instead, the knowledge is constructed in terms of language, the iconic representation of the Graphical User Interface and the outcomes which they produce. This knowledge construction is dynamic. Students tinker, tweak and work towards the final artefact which in its construction will define the knowledge, both for the student auteur and others of the peer group.

The content and form of the learning are thus inscribed within the artefacts produced: knowledge becomes tangible. If there is no artefact produced then there is no knowledge. Knowledge and outcome are synonymous. These students, cyber-bricoleurs, have become digital auteurs. Where film theory described the auteur as creating an entire conception with celluloid, or transforming a given script by imposing personal pre-occupations and continuing themes through the visual artefact, so these students work with their 'tools at hand' to transform the scripts handed to them by their teachers. The creations of these auteurs serve as metaphors for education. They have become self-referencing semiotic objects, both signifiers and signified.

Life-long learning and implications for schools

Students who use ICT as an integral part of their work develop learning strategies of their own. What these strategies have in common is that they build forward, towards an outcome, rather than building upon established blocks. Where routines from previous learning can be made to work they will be incorporated: where not, new ones will be developed. Students move from the specific to the general, and back again. Content is subordinate to, and subsumed within, structure.

A clash of learning styles

These strategies put them at variance with the majority of their teachers, whose approach to learning, content and outcomes tends to be fixed. Their expectations for the stages through which their students should pass and the outcomes which should be demonstrated are predicated on a empirical framework, constructed from their own professional education, experience and an occasional space for reflection. The likelihood of this matching that of their students is slight.

Structural inequalities

If there is a disjunction between teachers and the way in which these bricoleurs work and learn, then there is also one between these students and those who have limited access to ICT. Students whose access to ICT is limited therefore do not work or learn in this way, but have to accommodate themselves to the institutional paradigm. The disjunction is encoded in the concepts attached to work and the outcomes it produces. It is encoded in the expectations which each group brings to work. Most of all, it is encoded in the sense of autonomy which the bricoleurs possess, which their teachers do not expect and which other students may not feel.

The means of production

The result is a structural inequality: of productive capital; of cultural capital and of symbolic capital. The surveys have identified the increase in ownership of the technology. With this has come independence. Initially this was independence from the constraints of time and resources associated with school. This developed to independence from the limitations of software applications, as students appropriated programs from CD-ROMS provided by magazine and from software downloaded from the Internet. When this is combined with access to the seemingly unlimited information of CD-ROM and Internet sources the result is freedom from institutional constraints. The

student in school has moved from the position of a subject following prescribed sequences of activities, to that of creative entrepreneur carrying out commissions.

ICT is still regarded by many in education as an innovative technology. For most students, on the other hand, it has diffused into their lives. The gains which this produces not only lead to the increase in productivity that has been noted, but to a change in the way in which the production process is viewed: beliefs, values and praxis have changed.

Cultural capital

This ownership of the means of production leads to the accretion of cultural capital. The beliefs, value systems and production of artefacts shared by the practitioners are based upon a pool of knowledge and practice that is rapidly moving away from the mainstream of educational praxis. The modernist paradigm of a transparent technology, of structured systems, analysis and logical progression has been replaced by one of opacity, in which surface, simulation and 'play' are dominating.

The classroom cyborgs operate within this new domain. Their teachers do not.

Our cyborgs are establishing what Jameson (1991) terms a new domain of cognitive mapping, in which the individual subject establishes its own place in a global system. Not only does this need no legitimation from the school system, but the system finds its claims to legitimation weakened the further apart the two views move.

Symbolic capital

Computers present us with an opaque technology. In other words, the process is no longer apparent when they are used. When computer users had to enter a string of commands to activate a program or activity there was an apparent connection between what was done and what happened. If the user made a mistake, then either nothing, or the wrong thing happened. The point and click ostensiveness of the Graphical User Interface removes the transparency.

The icons and symbols of the Graphical User Interface merge with the icons of the web. The latest manifestation of the Windows operating system

claims 'seamless' integration with the web. Folders containing our documents, programs and online information sources all appear as one on the screen. Each time the user connects online there is the opportunity to update: what is new is what is now. In an auto-iterative system there is only the new, and there is no shock. In a virtual world the chief virtue is to read the simulations and build them into new forms. The modernist approach of systems, forms and control has no value in virtuality. The symbolic capital is in the hands of those who navigate the screens, manipulate the representations and who interpret the readings.

Differentials: of work and reward

Post-industrial economies such as the United Kingdom have undergone a significant shift in the structure of the workforce and the distribution of wealth. A definitive analysis may only be possible with the benefit of considerable historical hindsight, since many of the observed trends may well be of less significance than we suppose. In the opening of the new millennium there is furious debate about the worth and value of the information industries, compared with what are deemed to be 'real' industries. What is incontrovertible, however, is the correlation between flexibility, innovation, transferable skills and reward.

We can apply the analogy of the economy to work within schools, and the rewards attached to it. Whilst the terms primary, secondary and tertiary have their own connotations within education a different interpretation can be applied.

Work of a primary nature is limited to a system of decoding texts, information and knowledge, which results in the production of basic answers.

This approach to learning is teacher-controlled. Students who work in this way require constant input. Their productive output is directly related to this, and as such may easily be modified, corrected and assessed by their teachers. The curriculum within which they work is dominant. This is the conventional view of the educational process, reflected in approaches to the curriculum.

Secondary production involves the re-working and sequencing of the primary parts. The teachers define both the input and acceptable forms of output. The decoded elements are interpreted.

The secondary stage of educational production is also curriculum-based and dependent upon plans, schemes of work and quality control. It is subject

to the constant monitoring and scrutiny which produces quantifiable performance statistics and league tables. The modernist concept of 'value-added' is important at this stage of production. The school plant and teacher workforce are measured by the way in which they can improve the raw material of students by the application of National Curriculum and examination syllabus input.

In the tertiary stage we observe the application of texts, information and knowledge. These elements are capable of continual synthesis. The production process involves continuous innovation and syncretic thinking.

The students who form this group work as auteurs. They determine their own references and standards, whilst working with the given educational script. Their initial critics are students like themselves. These are the students engaging in the process of bricolage. What is significant is that, whilst the stage of secondary production is built on the primary base, there is no necessity for the tertiary superstructure to be a sequential development of the earlier stages. The material base for this stage is that of the productive capital that has already been described.

The rewards that may be earned by the first two stages of knowledge production are clearly understood by teachers, assessors and examiners within education, and bestowed by them. They form part of an established value system. The knowledge workers of the tertiary stage create their own values. Earlier measuring systems can no longer apply.

The nature of education

One of the recurrent themes of the education debates of the past forty years has been that of content against process. The introduction of the National Curriculum, with what many teachers see as a prescriptive syllabus and a mandatory content, would suggest that learner-centred education, with the student constructing her own knowledge, has been relegated to the footnotes of state education. At first sight it may appear as if the cyborgs of the tertiary sector of educational production are the standard-bearers of post-modern relativist process. Their praxis, however, is one that constructs knowledge: the working heuristic of discovery (Bruner, 1974). They take for granted the scripts within which they work. What they produce is a result of their discovery of the ways in which the information given and found, the tools to

hand and the time available can be transmuted into their creation. The artefact is the manifestation of their conceptual development.

What curricular requirements, productive capital and their creation of knowledge lack is the ethical base which a post-modern hermeneutics requires. In a world where information sources are available to anyone with online access there is an imperative for students to be taught the need for a system of citations and attributions, that knowledge and information are not simply commodities to be appropriated at will. In earlier stages of the education process students work with known information and sources, which their teachers control and recognise. The challenge for the teachers of these post-modern auto-epistemologists is to establish an ethical framework within which the new praxis can be located. Research for the Teacher Training Agency on teachers as innovators would appear to confirm this (Preston, Cox and Cox, 2000).

The autonomous learner

In a traditional approach to education teachers have motivated their students; students have motivated themselves to meet targets set by either their teachers or the system itself. The motivation for learning is therefore contained within and supported by the system. The new approach requires learners to be self-motivated. Rewards have to be intrinsic, rather than extrinsic. The new way of working, however, seeks to bring with it the approval of the peer group, who comment on the production values contained within the work. (This factor was recognised in early research into students and computers. (Somekh, 1986, in: Schostak, 1988).) What is now necessary is for teachers to provide clear performance criteria and evidence indicators for students' work. Whilst the traditional roles of a teacher will remain, those of advocate, mentor and verifier will need to be added.

The role of advocate will be two-fold: first, as advocate for the subject material and the discipline of which it is a part; second, as advocate for the long-term interests of the student. This will require an understanding of their working practices, neither being dazzled by the skills which they possess (the 'data dandies'), nor complaining about their lack of a traditional approach (Somekh and Davis, 1997).

A partnership of learning

The role of mentor will require a fundamental shift in the traditional relationship between student and teacher. That relationship had traditionally been predicated on the assumption that the teacher and the school would provide the information which the student required. Where that is no longer the case the teacher needs to provide guidance for the student through the task to be done, using pedagogical skills to suggest a range of possibilities to the student and leave open the specific outcomes.

The teacher will then be able to verify whether or not the student has achieved the objectives specified in the performance criteria and generated the relevant evidence indicators. Bruner's working heuristic of discovery will be created in the partnership of teacher, student and computer. For Life Long Learning to succeed there must be a partnership, and there must be a working heuristic of discovery. Without those two factors there will be training, rather than learning. The focus will be utilitarian and specifically focused. The shape and outcomes will be defined by others. The disjunction which has been identified, between learners who are establishing their autonomy and an educational approach that leans towards the prescriptive, it is the prescriptive that is likely to increase.