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THE NATURE OF VOCATIONAL LEARNERS

One of the central precepts of flexible methods of delivery for workplace learning is the notion of learner autonomy and self-directedness (McCollum & Calder, 1995). That need for the skills of self-directedness is most important where the mosaic of flexible delivery methods used requires a component of resource-based learning. However, there is a growing body of evidence that vocational education and training (VET) students, and other learners in the workplace, prefer to learn in a collaborative environment with their peers and instructors. Research by Warner, Christie and Choy (1998) has shown, in a large sample study, that VET students have a preference for social environments for learning, while Beckett (1997) has observed that flexible delivery may ‘shoot VET in the foot’ if attention is not paid to inter-student communication, and instructor-student communication.

Smith (2000a, 2001a) has shown with separate groups of apprentices, and technology students in VET, that collaborative learning is clearly a preferred choice among these learners. In his first study of 389 apprentices (Smith, 2000a) a factor analytic study of responses to a standardised learning preferences questionnaire (Canfield, 1980) showed three clear factors emerging. These factors related to a preference for Non-verbal learning (eg. through demonstration, hands on experience etc) as opposed to Verbal learning through reading or listening; a factor showing that a well structured program with details of learner requirements was favoured by apprentices; and a third factor that showed these learners prefer social learning environments over independent or self-directed learning.

A second study (Smith, 2001a), with 338 technology students in VET, indicated a similar set of three factors, except that the preference towards collaborative learning was much more evident among those learners. A third study by Smith (as yet unpublished) of 286 Business students in VET again yielded similar factors, with a clear first factor being associated with collaborative learning. Finally, in a fourth study (Smith, 2000b), all VET learner samples were combined since there was evidence of similar factor structures among each of the groups. That study yielded a very robust two-factor solution indicating again that collaborative learning in a social environment dependent on peers and instructors is strongly favoured by VET learners both in the context of TAFE delivered programs and in a context of workplace based learning.

Boote (1998) has argued that VET learners have not typically developed the cognitive and metacognitive skills for the self-directed learning required in flexible delivery. In the UK, McCollum and Calder (1995) have pointed to the difficulties confronting vocational learners expected to work in an independent mode requiring self-direction and little contact with instructors. Studies in the US by Reading-Brown and Hayden (1989) and Tamir (1985) have also indicated that technical students prefer working in a well-structured and supportive environment. Sadler-Smith, Down and Lean (2000) in the UK have suggested that the enthusiasm for the flexible delivery of training using distance education methods has been possibly greater among ‘converted and privileged groups (such as managers)’ (p.475) than it has been among the learners themselves, who are more likely to feel somewhat isolated by the experience. Sadler-Smith, Allinson and Hayes (2000), in a study of the learning preferences of human resource practitioners in the UK, observed that work-based and traditional methods of learning were preferred over self-directed methods.
REFEREED FORUM PAPERS

STRATEGIES FOR SELF-DIRECTED LEARNING

As Smith (2000a) has pointed out, the preferences for non-verbal presentation of learning material and for an affiliative learning environment present major challenges to the successful use of flexible delivery with vocational learners, most particularly where the delivery methods rely on the use of learning resources provided for independent and self-directed learning. Smith (2000c) has developed a model of flexible delivery in the workplace that includes a comprehensive set of strategies designed to assist these learners to become more independent and self-directed. The model also includes strategies to prepare learners to make effective use of their preference for affiliation with instructors and other learners in a flexible delivery context. Those strategies, derived from his research with learners and with their workplaces, were divided into those focussed on preparing learners better for flexible delivery; and those aimed to enhance the readiness of their workplaces to support flexible learning. A full discussion of those strategies is provided in Smith (2000c).

Strategies identified by Smith (2000c) for the preparation of learners were focussed in the following areas:

- Development of self-directed learning in an environment of less instructor guidance;
- Development of skills and concepts through a range of learning media and methods;
- Preparedness to structure own learning within a community of practice.

Strategies for the development of workplace support for flexible learning were also developed by Smith (2000c). In the present paper, it is intended to focus on ways in which computer mediated communication (CMC) may be effectively used to support the strategies aimed at the preparation of learners and their acquisition of skills and conceptual knowledge. Smith (2001b) has already identified and commented on the potential use of CMC in the flexible delivery of training to business learners.

Smith’s (2000c) model of flexible learning in the workplace is consistent with Trentin’s (1999) synaptic chart of network-based collaborative education, which provides an analysis of the educational model and the educational processes included in network-based learning systems. Capacity of the network to provide interpersonal communication, and the innovative use of technology for learning (Trentin, 1999), are part of the educational model being suggested in this paper for workplace learning. Trentin also suggests that network-based education focuses upon teaching and learning of subject content, and development of cognitive abilities. The model proposed by Trentin is consistent with Smith’s (2000c) identification of learner development of skills for flexible learning, and the development of the skills and concepts required by the content of the training program.

In a major review of research in the on-line provision of VET programs, Smith and Henry (2000) have observed that the vast majority of evidence supported the view that successful on-line training must include the capacity for interaction between learners and between learners and their instructors. Accordingly, the implementation of a network-based model of workplace training, based on CMC, is attractive and consistent with the characteristics of the learners and of the increasing use of flexible learning methods using technology mediated forms of delivery (Mitchell, 2000).

COLLABORATIVE LEARNING AND CMC

Computer mediated communication allows opportunity for the development of networks to support learning in social contexts, and a capacity to overcome what Garrison (1995, p.138) has called ‘naive constructivism’, where learning materials are provided to students and they are expected to construct meaning on their own. Trentin (1999) has argued that the power of new communication systems lies in the potential to support collaborative education, defined as the linking together and merging of the various participants in an education activity, such as teachers, students, or external parties such as consultants or other experts. In reviewing a number of definitions of collaborative learning, Trentin is anxious to point out that the concept rests on a view that knowledge is not something delivered to students, but rather it emerges from active dialogue. That notion of collaborative learning is much the same as that shown by Billett and Rose (1997) to be most effective in securing conceptual knowledge in the workplace.
The conceptualisation of CMC used in this paper is that discussed by Stacey (1998) and characterised by groupware systems (eg FirstClass*) that enable learners to interact with other learners, with their instructors, and with other experts who may be external to the teaching-learning environment. That conceptualisation of CMC is consistent with Trentin’s notions of collaborative learning. Stacey's research (1996, 1998) has shown the importance of technology to support group collaboration in learning. Her discussion of technologically mediated learning from a social constructivist perspective has focused on interactive online group discussion as central to the learners’ effective construction of new conceptual understandings. Stacey’s research into CMC has found that, in the social context of group interaction, the collaborative group develops a consensus of knowledge through communicating different perspectives, receiving feedback from other students and teachers and discussing ideas, until understanding is reached. Drawing on Vygotsky’s (1978) theory that conceptual understandings are developed through verbal interaction, Stacey argued that a socially constructed learning environment is essential for effective learning. The social conversation provides the learner with a context and stimulus for thought construction and learning which is the means by which the group contributes more to each learners’ understanding than they are able to do individually. As Smith (2000c) pointed out, although flexible delivery provides some challenges for VET learners, at the same time their preference for social contexts for learning provide an opportunity for innovative approaches that will use that preference effectively.

A useful framework for the development of learner preparedness and training delivery is provided by Salmon (2000) in her model of teaching and learning online through CMC. She has proposed a five-stage model whereby participants gradually increase their involvement in, and commitment to, CMC as they become more comfortable and proficient with the environment. As the stages progress, so does the sophistication of the interaction and the learning outcomes. These five stages are:

- **Access and motivation**, during which participants set up and gain access, and instructors (or e-moderators) encourage participant use of the CMC facility;
- **Online socialisation**, during which stage participants start to communicate with each other, both individually and in groups, with the majority of interchange being social chit-chat;
- **Information exchange**, during which participants begin to develop an appreciation of what is available to them online, both in terms of information and interaction with others who can assist them in learning;
- **Knowledge construction** is a stage during which participants interact in ‘more exposed and participative ways’ (Salmon, 2000, p.32) to formulate and express their ideas, and receive feedback on those ideas;
- **Development** is the fifth stage, during which participants become more responsible for their own learning and make use of computer mediated opportunities to learn with little assistance required from instructors, other than when identified by the learner. As Salmon observes, at this stage the pursuits of learners become more individualised.

The application of this staged model to the strategies identified by Smith (2000c), and the network-based collaborative model proposed by Trentin (1999) provides for some clear direction and support in the use of CMC to support flexible delivery to VET learners. Additionally, the preference among vocational learners for non-verbal presentation of learning is a clear challenge for CMC, which is heavily text based (Trentin, 1999). The Salmon staged model provides opportunity here for learners to develop greater comfort with this form of communication by initially using it for non-challenging forms and content in communication, and for leveraging off the learners’ typical interest in socially mediated environments. Riding and Sadler-Smith (1997) have made the point that the development of new strategies for learning can be powerfully leveraged off existing strategies with which learners are already comfortable. Salmon’s notion of the e-moderator also provides an opportunity to develop these skills through a very skilled moderator who may not just be assisting learners to communicate well in CMC, but may also assist instructors. It is to be expected that a number of instructors will be new to this form of communication and teaching, and a number will not be strong in verbal skills either.

Important here is Trentin’s (1999) advice that instructors recognise that the learning objective to be pursued is the development of collaborative learning such that learners integrate new information into cognitive structures that already exist, and which are the result of personal experience and personal learning. Specifically, Trentin describes these as
Activities that make it possible to discuss, explain, and recall previous experiences, to gather and structure information, and to involve students in work that closely links abstract learning of concepts with direct experience (Trentin, 1999, p.149).

Trentin observes the suitability for this form of learning to collaboration through network-based learning, and draws attention to the need for instructors to play a facilitatory role that stimulates discussion between participants, and encourages them to explore their own questions. It is important for instructors not to take a directive role, nor to provide answers at the expense of encouraging discussion. Clearly, Salmon’s notion of e-moderators can be very useful in framing these discussions, and in assisting the instructor to develop the discussion at the information exchange and knowledge construction levels.

THE STRATEGIC USE OF CMC

A number of the detailed strategies developed by Smith (2000c) to enhance learner preparedness for flexible delivery are capable of implementation through CMC as a component of a workplace learning sequence. In supporting each of these strategies through CMC, there will be need for instructors to be flexible in terms of the stage in Salmon’s model that each participant is engaged with at any one time, and to support the learner in effectively using that stage, and moving on to further stages. Once the first stage of access and motivation is achieved, each of the strategies listed below is supported at each level of Salmon’s model, through interaction with instructors, other learners, or other expert participants (Trentin, 1999). In developing learners and instructors to participate in the higher stages of Salmon’s model, it is useful to take note of the observation by Klemm and Snell (1995) that, unless instructors are vigilant and well organised, participants can trivialise the interactions on CMC such that they engage in only the most surface of ways.

Learner preparation and engagement strategies developed by Smith (2000c) and amenable to CMC are organised below under the headings used earlier in this paper to describe the broad strategies identified as useful in the preparation of learners.

Development of self-directed learning in an environment of less instructor guidance

In the context of learning in the workplace, these features of self-directed learning can be developed within an authentic, real-world environment where there is access to authentic tasks and expert guidance (Brown, Collins & Duguid, 1989). Additionally, these features can be developed through careful integration of off-the-job and on-the-job learning (Fuller, 1996). Strategies suggested here for the development of these identified features of self-directed learning can be implemented and enhanced by CMC through providing opportunity for the instructor/trainer and the learner to discuss and develop a learning contract over time, to operationalise that contract, and to monitor its achievement. CMC also provides ongoing opportunity for discussion and modification of learning through discussion with the instructor, or with the instructor and fellow learners. Such strategies may comprise:

- assistance in grounding new learning goals in a context of experience, existing knowledge, and an appreciation of the place of learning in becoming an expert worker;
- assistance to learners to understand their learning within the broader context of the workplace;
- assistance to learners in the development and negotiation of learning goals;
- assistance to learners in developing and negotiating a learning plan and learning contract, starting with limited contracts prior to developing towards more comprehensive contracts;
- assistance in the identification of authentic tasks and learning resources through which the learning contract is to be pursued;
- assistance in the identification and accessing of other experts who can provide demonstration, discussion and guided practice;
- working with learners to develop a structured approach to completing the learning contract negotiated between the learner and trainer;
• working with learners to develop monitoring of learning as it proceeds, and the self-evaluation of learning outcomes;
• provision of regular discussion with learners on their learning contract;
• discussing achievements as learning proceeds, and assistance to modify learning contracts on the basis of that feedback;
• encouragement of cognitive and metacognitive skills such as anticipation and questioning; strategy planning and analysis; wider use of learning resources; monitoring of learning processes; articulation of knowledge;

Development of skills and conceptual knowledge through a range of learning media and methods

Strategies for skills and concept development will necessarily involve scaffolding and modelling, and the fading of the scaffolding (Farmer, Buckmaster & LeGrand, 1992). Also needing inclusion is the opportunity for the learner to appreciate the place that the new skills hold in the workplace and in the development of personal expertise (Caine & Caine, 1991; Harris et al., 1998). Opportunities to discuss the learning with other learners (Biggs, 1994; Candy, Crebert & O’Leary, 1994), to reflect on and articulate the knowledge gained from learning (Caine & Caine, 1991; Collins, 1991) will also provide opportunity to appropriate meaning in the learning. Discussion and observation assist with the identification of heuristics used by the more expert worker in carrying out the task.

Specific strategies suggested here for the effective development of skills and conceptual knowledge, and amenable to implementation through CMC, are:
• assistance in the development and negotiation of learning contracts that clearly specify the skills and concepts to be learned;
• provision of regular meetings to discuss and receive feedback on progression towards completion of learning contracts;
• provision of assistance to recognise current skills and knowledge as a basis for the acquisition of new learning;
• assistance in the identification of authentic tasks for learning;
• provision of opportunity for deliberation, reflection, and articulation of knowledge;
• provision of learning scaffolding and its planned withdrawal;
• exposure to a diversity of experiences and problem-solving situations;
• assistance in the integration of on- and off-the-job learning experiences;
• encouragement and facilitation to use a broad range of learning strategies, and a wide use of learning resources, including resources that are verbally or textually presented.

Preparedness to structure own learning within a community of practice

The importance of a community of practice is a cornerstone to theories of situated learning and cognitive apprenticeship. Billett (1993) traces the idea to activity theory as proposed by Vygotsky (1978), who claimed that knowledge is socially and culturally constructed. A community of practice provides the context for learners to understand the values and ethos of the organisation, and enables the appropriation of knowledge through authentic and situated tasks. The community of practice provides opportunity for the development of transferable knowledge through socio-culturally rich and authentic learning experiences guided by expert mentors (Billett, 1994, 1996) and accepts that learning and thinking are typically social activities.

Specific strategies to develop preparedness for flexible learning, within a community of practice, and amenable to CMC might comprise:
• developing an understanding among learners of their work and training within the context of the workplace, and others within the workplace;
• development among learners of a clear understanding of the workplace ethos, values, and policies;
• development among learners of their dual role as learners and as workers;
• encouragement and facilitation to learners to form relationships with trainers, supervisors, peers, and other experts to enable discussion of developing skills and knowledge;
• assistance with identification of learning objectives to be pursued through interaction with others, through discussion, demonstration, articulation etc;
• assistance with skills of structured observation and question-asking;

CONCLUSIONS

The typical preferences for VET learners to learn through non-verbal presentations, and in structured environments and social contexts where there is opportunity for knowledge construction through interaction with peer learners and instructors, provides some challenges to the flexible delivery of training in workplaces (Smith, 2000a, 2000c). CMC can play a major part in the provision of structure and social interaction to better serve the collaborative learning needs of these learners, where the instruction is provided at least partially from off-site sources, and where fellow learners are distributed across a number of workplaces (Trentin, 1999). The strategies identified (Smith, 2000c) to assist learners to become more self-directed, to learn the skills and conceptual knowledge required by their training, and to learn through participation in a wider community of practice are largely amenable to CMC. The staged model proposed by Salmon (2000) provides a number of options for instructors and learners, as well as a developmental pathway to the effective use of flexible learning online.

While the strategies proposed by Smith (2000c) in his model of flexible delivery in the workplace are largely amenable to CMC, a challenge remains in the preference of VET learners to construct knowledge through non-verbal presentations. The heavy use of verbal communication in CMC requires that learners also be assisted in the use of that form of communication. Salmon’s model of gradual development of usage and comfort with CMC does, though, provide opportunity for these skills to be developed and effectively utilised both by learners and instructors. Salmon’s notion of an e-moderator may be useful here, since in workplace training there is a possibility that at least some instructors may also need assistance in becoming comfortable with the CMC medium, and ensuring that communication develops learners and their understandings, rather than becoming trivialised (Klemm & Snell, 1995).

REFERENCES


