Small Group

Teaching and Learning in Psychology

A review of research in small-group teaching and suggestions for good practice

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Introduction

The Current Situation

Teaching contexts where groups of undergraduates are expected to interact in the interests of learning are a significant feature of the Higher Education (HE) teaching of Psychology. LTSN Psychology's (2000) *Survey of Departmental Needs and Practices* showed that small-group teaching, as defined above, accounts for up to 40% of formal provision during the first and second years of undergraduate degree courses. All completed surveys made reference to some kind of small-group teaching strategy. Responses to a questionnaire administered to Psychology Heads of Department (HODs) in the Autumn of 2001 indicate that the contribution of small-group teaching can rise as high as 70-75% in the final (i.e. third and occasionally fourth) years.

Computer-supported small-group teaching is increasing, via online discussion (for example, e-mail, bulletin boards, video-conferencing) and/or around electronic resources (for example, multimedia, the Web, simulations). Appendix 1 provides a list of communication and information technology (C&IT) tools and resources of relevance to small-group provision. The main triggers for adoption of C&IT in group work are reported by Bennett (2001) as increasing class sizes with no corresponding increase in physical or financial resources, management pressure, the perception that students expect it and peer pressure. Bennett found that 55% of the employment of new methods (C&IT and/or group work) arose from individual initiatives rather than from any form of institutional strategy.

Whether computer-supported or not, small-group teaching is highly valued. The questionnaire to Psychology HODs requested ratings of how crucial small-group teaching is to the overall learning process at the undergraduate level. The mean rating (for all year groups) was 5.64 on a scale of 1 to 7 (with 7 being very crucial). One HOD commented that their department is "very much in favour of small-group teaching", and another pointed out that "Students feel very isolated if they never meet the staff in small groups. Also, the small group provides all sorts of opportunities not occurring in other aspects of the course". It was further observed that "Students respond favourably to the diversity of teaching methods".

Looking at the use of C&IT in particular, researchers have reported benefits in:

- building communities of learners (Gibbs, 1999)
- increased student responsibility, initiative and participation (McComb, 1994)
- promoting reflection (Hara, Bonk & Angeli, 2000), engagement (Henri, 1995) and deeper discussion (Bonk, Hansen, Grabner, Lazar & Mirabelli, 1998)
- removal of time and space restrictions (Harasim, 1993)
- development of teamwork skills and preparation for work (Lipnach & Stamps, 1997)
- enjoyment and motivation (Pychyl, Clarke & Abarbanel, 1999).

Sources of Dissatisfaction

Work carried out for a project concerned with electronic support for student interaction (ASTER, 2001) shows that the aims for group work within Psychology include communication skills, team-building skills, C&IT skills, presentation skills, time management and independent learning skills, data analysis skills, cognitive/analytical skills, reflection and critical awareness, research skills, problem solving, and discipline-specific understanding. By and large, departments feel that these aims are addressed via their current arrangements. Nevertheless, a sense of sub-optimal outcome remains, with the HOD questionnaire identifying perceived problems with student engagement, tutor skills and sheer availability of space and time.

One source of dissatisfaction may be the sense that small-group work as currently practised bears little resemblance to its historical antecedents. The tradition of students interacting in order to learn stems from the Ancient Greeks, the so-called ‘Socratic dialogues’. The emphasis of the Greeks was however upon interaction with a ‘master’, an emphasis that was perpetuated in mediaeval HE institutions and continues occasionally to this day. One HOD responded to the above-mentioned questionnaire by stating that one-to-one/tutor-to-student arrangements were commonplace in his department. However, this was exceptional. The majority of departments reported considerable dilution of both the master-apprentice relation (as postgraduates rather than professors are increasingly involved) and the one-to-one model (as ever-expanding numbers of students are incorporated in a group). Groups of 21 or more students were reported in 47% of departments.

With the dilution comes uncertainty, and the suspicion that all might not be well. Questions are raised, for instance are the major lines of dialogue still supposed to be between individual students and their tutors? If so, how can this best be achieved in a one-to-many setting? Can student-student interaction contribute to individual learning? If it can, should the contribution be regarded as compensatory (for the diminished role of tutors) or can it add something that tutors cannot achieve? Is there antipathy between optimal tutor-student interaction and optimal student-student? Finally, is there a single correct answer to these questions, or does the answer vary depending on which of the multi-faceted aims for group work are currently being served and/or whether the interaction is online or face-to-face?

Most HE teachers in Psychology feel unsure about how to answer such questions. However, perhaps because they perceive the shapers of practice to be economic rather than pedagogic, they doubt whether present arrangements are ideal. Are they correct, and if they are can anything be done to improve matters within the current socio-political climate? These are the issues that this report is intended to address. The report will attempt to spell out what pedagogic research (theoretical and empirical) suggests about productive group work in undergraduate teaching, i.e. what forms of interaction and/or student attitudes are helpful, and how these should be fostered through, student organisation, task design and tutor support. Current practice in Psychology will be evaluated against the research, and the possibilities for improvement (including via the use of C&IT) will be addressed.

Theoretical Background

The Vygotskyan Tradition

As noted above, small-group teaching has evolved as an overlay upon the traditional master-apprentice model. Within psychological theory, this model continues, most obviously through the socio-cultural tradition that has developed from the work of Vygotsky (for example, Vygotsky, 1962, 1978). Vygotsky viewed learners as possessing ‘zones of proximal development’ (ZPDs), which he regarded as the metaphorical distance between what learners are able to achieve unaided and what they can achieve under the guidance of an expert (McLoughlin & Oliver, 1998). Since Vygotsky believed that every function appears twice, first on the social level and then on the individual level (Vygotsky, 1978), he felt that the route to progress was ZPD-crossing during interaction with an expert.

Although Vygotsky's ideas have been refined by subsequent theorists (see for example, Rogoff, 1990), the notion of expert-led ZPD-crossing survives. Unfortunately, as has been noted elsewhere (for example, by Crook, 1994), it seems to require individually-tailored attention. Each student's initial knowledge and ZPD need to be identified, and there has to be constant up-dating as interaction proceeds. Wood, Bruner and Ross (1976) have shown that such 'scaffolding' taxes the ingenuity of mothers working with pre-school children, and it is likely therefore to prove immensely difficult even in one-to-one HE teaching. One-to-group contexts should compound the problem immeasurably. Nevertheless most children manage to develop despite the seemingly crude approximations to ZPD-crossing that they experience with their mothers. Therefore, it can be assumed that human learning must be robust against some dilution of Vygotskyan principles.

The fact that Vygotsky's model must amount to an impractical ideal has provided comfort to those of his followers who take an interest in teaching and learning. Accepting that students must be able to learn without truly individualised attention, they have attempted (mostly with primary school children) to develop workable but toned-down versions of the Vygotskyan approach. In some cases, the focus has been on task design. For instance, Howe, Tolmie, Duchak-Tanner and Rattray (2000) have shown that outcomes can be optimised if groups of learners are required to reach a consensual viewpoint which the expert then addresses. It does not matter whether the viewpoint is genuinely endorsed by all members of the group. More commonly though, neo-Vygotskyan approaches have been concerned with the potential of students to act as 'expert guides' to each other, in what might be regarded as collaborative ZPD-crossing. This has, for instance, been a central theme in the 'peer-tutoring' movement (Topping & Ehly, 1998).

Student-Student Interaction

So far, the emphasis has been on theoretical perspectives that, whether their proponents acknowledge this or not, see the one-to-one/tutor-to-student approach as ideal. Thus, insofar as small-group teaching has something to contribute, it is because it does not stray too far from the ideal. Contrasting with these perspectives are approaches that see student-student interaction as offering something positive. Slavin (1989, 1992, 1995) identifies three major variants of the latter approaches, and these are approximately replicated in Springer, Stanne and Donovan's (1999) meta-analysis of the effects of small-group teaching at the post-secondary level.

Motivational Approaches

The first set of approaches (for example, Johnson & Johnson, 1992; Slavin, 1983a, 1983b, 1995) focuses on the reward arrangements under which students operate. These approaches criticise traditional arrangements on the grounds that competitive grading and informal reward structures create peer norms that oppose academic effort (see Coleman, 1961). Since one student's success decreases the chances that others will succeed, students are likely to develop norms that high achievement is for 'nerds' (Slavin, 1996) or that it may interfere with their own success (Springer et al., 1999). It is argued that if students value the success of the group as a whole and are rewarded for this, they will encourage and help one another to achieve.

Proponents of the motivational perspective also emphasise the importance of individual accountability. An underlying assumption is that students might readily interact with or help one another, but without appropriate accountability mechanisms their help might merely consist of sharing answers and doing each other's work. By holding each group member accountable for learning, the incentive structure supports mature teaching and the regular assessment of each other's progress (Springer et al., 1999).

Social Cohesion Approaches

Social cohesion approaches are based largely on Dewey's (1943) experiential philosophy, and generally emphasise intrinsic rather than extrinsic motivations. These approaches presuppose that group work in non-threatening environments can lead naturally to learning. They hold that the effects on achievement are strongly mediated by the cohesiveness of the group, in essence that students will help each other to learn because they care about each other and want each other to succeed.

Social cohesion approaches are similar to the motivational perspective in that they emphasise social relational rather than cognitive factors. However, here students are seen as intrinsically motivated to help each other. Social cohesion theorists tend to downplay or reject the role of group incentives and individual accountability. For example, Cohen (1986) states that students will find the process of group work rewarding if the task is sufficiently interesting and challenging, and they are prepared with the necessary skills for group work. He suggests that students should not be assessed on their individual contributions to the group product.

Cognitive Approaches

In contrast to the social relational emphasis of the motivational and social cohesion approaches the third perspective identified by Slavin (1983a, 1983b, 1995) holds that interactions among students will in themselves increase achievement. This is for reasons that have to do with the processing of information rather than with motivations, and therefore approaches that emphasise interactions are often referred to as 'cognitive'. The earliest cognitive model may have been Piaget's, as outlined in Piaget (1932). Committed to the idea that cognitive development depends on the reconciliation of conflict between competing ideas, Piaget (op cit.) suggested that peer interaction may be a primary vehicle for stimulating conflict and, through this, for precipitating growth.

A more recent cognitive perspective may be described as 'cognitive elaboration'. Research in Cognitive Psychology has long held that, if new information is to be retained, it must be related to information already in memory. Therefore learners must engage in some sort of restructuring, or elaboration, of the material (Wittrock, 1986). One of the most effective means of elaboration is explaining the material to someone else (Chi, de Leeuw, Chiu & LaVancher, 1994; Dansereau, 1998), and interaction with peers around some mutually engaged-with task provides a context where explanation would appear to be natural.

Social Cognition

Although developed from different standpoints, many of the theories outlined above are compatible with each other. Recent researchers have therefore begun a process of integration to find more holistic explanations that combine the motivational, social cohesion and cognitive approaches into a unified account. These new explanations are usually subsumed under the term 'social cognition', and they have tended to direct attention away from individual functioning in group contexts and towards the collective aspects of cognition in groups. Terms such as 'socio-cognition' (Levine & Resnick, 1993), 'transactive memory' (Wegner, Erber & Raymond, 1991), and 'group culture and socialisation' (Levine & Moreland, 1991) have begun to be applied. These terms suggest that cognition is a product of social interchange and is constructed, shared and distributed among students during social interaction.

The underpinning idea here is that in social interaction, individuals do not simply replace cognitions. Instead, there is an active, integrating process taking place which results in unique, collectively produced conceptualisations including ideas, representations, solutions and arguments that no one person had at the beginning (Gruenfeld & Hollingshead, 1993). This approach is consistent with research on minority and majority influence (for example, Nemeth, 1986), attitude change (for example, Petty & Cacioppo, 1981) and socio-cognitive conflict (for example, Doise & Mugny, 1984; Howe, Tolmie & Rogers, 1992; Tolmie, Howe, Mackenzie & Greer, 1993), which suggests that learning from social interaction is not the result of imitation and conformity but rather of active responses to the views of others.

The integration of the motivational, social cohesion and cognitive approaches under the banner of 'social cognition' provides a partial answer to the questions that were raised earlier. Student-student interaction can contribute to individual learning, and the contribution should be capable of adding something that tutors cannot achieve. Nevertheless, the issue remains of reconciliation with perspectives that emphasise the tutor-student relationship. Piaget (1932) took an uncompromising line here, claiming that authority figures like parents and teachers must necessarily undermine student-student 'co-ordination'. However, other more accommodating perspectives seem possible, and researchers have begun to take steps towards spelling these out (see for example, papers in Joiner, Littleton, Faulkner & Miell, 2000). Nevertheless, an all-embracing theory that encompasses the one-to-many relationship between tutors and small groups of students remains to be developed.

Implications for Reviewing the Research

Given the current state of theorising within the field, it will hardly surprise to learn that there is no empirical research at present which tests all-encompassing hypotheses about effective practice. Insofar as studies are theoretically driven, they tend either to test hypotheses relating to one perspective only or to explore an eclectic (and not necessarily fully articulated) mix from several perspectives. As MacGregor (1992, p. 37) observes, theories are "more like an arbor of vines growing in parallel, crossing, or intertwined" in terms of their impact upon empirical research into HE group work.

Typically though, research bypasses theory altogether. A favoured teaching method is felt by some practitioner to be 'working', and an evaluation (sometimes, but not always, controlled) is carried out to demonstrate that intuitions are well-founded. The evaluation may attempt to identify the factors that underpin success, and these factors may be relatable post hoc to theory. However, the research itself is not theoretically driven, which means of course that the results cannot inform the development of an integrated model. More specifically, the characteristic approach to evaluation poses challenges for any straightforward reconciliation of theory and data in the writing of this report.

Faced with this challenge, the approach taken below is to assume, on the basis of what theory currently exists, that productive group work depends on the (only partially predictable) inter-play of: a) student organisation, b) task design and c) tutor support. These three variables will be used in this report to structure the relevant studies, with relevance being defined as providing evidence about achievement of any of the aims that HE teachers of Psychology hold for group work. These aims, documented in detail in ASTER (2001), were presented earlier (p. 4), and include: communication skills, team-building skills, C&IT skills, presentation skills, time management and independent learning skills, data analysis skills, cognitive/analytical skills, reflection and critical awareness, research skills, problem solving, and discipline-specific understanding. It should be noted that by virtue of focusing on these aims, limited attention can be paid to the voluminous social psychological literature on small-group functioning (see, for example, Brown, 1988). This literature will only be mentioned in passing when it seems relevant.

It is recognised that the achievement of aims depends upon interaction (see Cohen, 1994), with the way that a group interacts determining its success on all levels. Equally, it is also recognised that interaction has its effects through its impact upon one or both of two interrelated processes: students' motivation to learn and students' processing, acquisition and retention of information (Lou et al., 1996). Nevertheless, the partially pre-theoretical nature of the field means that the relations between interaction, motivation, information processing and the achievement of aims cannot be reliably articulated. Therefore, the safer approach is the one adopted here, to define relevance with reference to outcome and to comment on the mediating factors where the evidence warrants this.

Student Organisation

Impersonal Factors

While students sometimes choose their own groups, it seems likely that in the HE teaching of Psychology, the assignment of students to classroom groups is often a largely de-personalised process. Names are typically plucked from Registry-supplied lists and associated with groups in an approximately random fashion. If this is the case, the most obviously relevant aspects of student organisation are those that transcend individual characteristics, and certainly such factors can be shown to have an effect.

For instance, students overwhelmingly differentiate small-group activities on the basis of the settings within which they occur, so practical arrangements obviously have a direct impact on perceptions, expectations and, most probably, outcomes. In addition, the physical environment is known to affect interaction and decision-making. For example, "it is in the physical arrangements of chairs that many of the basic yet influential problems in group discussion occur" (Jaques, 2000, p. 159). It is accepted that, for purposes of face-to-face interaction, a circle of chairs is best for the inclusion of everyone. It is interesting to note from the HOD survey that was mentioned earlier (p. 4), that constraints of a practical nature are among the most widely cited difficulties for small-group teaching.

When using computers, room layout may be less adaptable. Adequate access to computers to enable students to complete their work is vital (Pychyl et al., 1999). Computer rooms may be in short supply and need to be booked well in advance. If students are expected to work on computers in their own time, access is again important (Althaus, 1997; Crook, 1997).

The size of the group can also affect its intimacy and interaction. With a little initiative a variety of group sizes can be created for different purposes (Jaques, 2000). Looking at the literature it seems that groups of three to six students are the most widely advocated. Brown and Atkins (1988, p. 51) report 20 students to be an approximate upper limit for productive interaction, but most research suggests a much lower limit, for example, seven to ten students. Lou et al.'s (1996) meta-analysis found no difference in achievement for groups of six to ten in comparison with ungrouped classes. This is especially interesting when we consider how the HOD survey suggests that groups of 11 to 20 (and even larger) are very widely used in HE Psychology.

Interestingly, the same principles of optimal size appear to apply in online groups with students being less self-conscious when working in relatively small groups (Tolmie & Boyle, 2000). Light, Colbourn and Light (1997) found that e-mail discussions within groups of six Psychology students were longer, more frequent and more balanced than interactions within a single whole-class group of 80. In an equivalent environment, Steeples, Goodyear and Mellar (1994) observed that students assigned to large groups spontaneously set up smaller conferences. Althauser and Matuga (1998) saw small group sizes as a major factor in the success of their HE computer conferencing system, allowing all members to participate freely, contribute ideas and receive critical responses. However, Wibe (1994) found that a certain amount of activity was required in an online conference, so the group should not be too small. Whatever the group size though, it seems that students prefer to know who else is present in a shared space, and to use this knowledge to guide their work (Ackerman, 1997).

Gender and Ethnicity

Continuing the presupposition of group assignment from lists of names, the most tractable individual characteristics are likely to be categorical ones such as gender and (in some cases) ethnicity. As it happens, such features appear to have little relevance to productive group work at the HE level. Indeed the main point to emerge from the literature is that due to the more frequent and less constrained student-student interaction encouraged by group work, women and members of minority ethnic groups have greater opportunities to be heard and to learn than in whole-class contexts (Belenky, Clinchy, Goldberger & Tarule, 1986).

Springer et al. (1999) found no significant difference between men and women in their response to grouping arrangements, and moreover, discovered the positive effects of small-group learning to be significantly greater for members of minority ethnic groups. More favourable attitudes were also evident, especially in groups of women.

Nevertheless, conclusions here must be treated with caution. There is a dearth of research into gender and ethnicity issues in the context of HE. Most of the gender and ethnicity related research in academic institutions concerns children (Howe, 1997; Mowatt & Siann, 1997) and research into the implications of gender and ethnicity for adult learning in groups has largely been conducted in the field of business management. It does seem however that in task oriented learning groups, gender exerts a relatively minor influence (Mowatt & Siann, 1997).

Early research into the use of computers often found that women were disadvantaged because of more limited access to computers and lower technology literacy. This is now no longer the case (Gunn, French, McLeod, McSporran & Conole, 2002). Many authors describe an ‘equalisation’ effect similar to that reported for face-to-face groups (see, for example, Light et al., 1997). Comparing participation in computer-based discussions using online newsgroups, Clawson and Choate (1999) found that men and women participated at the same rate. Steeples et al. (1994) also report a ‘democratising’ influence for online learning contexts. Despite this, recent research is suggesting that differences continue in the ways that males and females use technology, in their confidence, use of support systems, patterns of interaction and particularly in their styles of participation and contribution in computer-mediated communication (CMC) dialogue (Gunn et al., 2002).

Students’ attitudes to group work may be affected by their cultural background. For example, students from a ‘collectivist’ culture (for example, Japan, China, Korea) value goals and interests related to the group whereas those from ‘individualistic’ cultures (for example, Britain, USA) are more self-oriented (Walker, 2001).

Ability Composition
Contrasting with the limited relevance of gender and ethnicity, there is (awkwardly for list-based assignment of students to groups) evidence of strong effects from students' personal qualities. For instance, Lou et al. (1996) have found that group ability composition has a differential effect on student learning. The authors' meta-analysis indicates that low-ability students gain most from being placed in mixed-ability groups. Consistent with both the peer-tutoring and cognitive elaboration approaches outlined earlier (p. 6 ff.), these gains result from the individual guidance and assistance that low-ability students receive from their more able peers. Reciprocally, the more able students benefit greatly from the process of explaining, and by this means develop a deeper understanding of the material in hand. A contrast was found however with medium-ability students who gained most from placement in same ability groups. Lou et al. suggest that for these students, sharing in the giving and receiving of explanations, securing high group cohesiveness, and receiving appropriate instructional materials may be the important factors.

So what should the practising teacher make of these results? As Lou et al. (1996) point out, same-ability groupings may be particularly conducive to group cohesiveness at all ability levels, as students may have similar expectations about group goals. Against this though, same-ability groupings do not create as good a stage as mixed-ability for cognitive conflicts to arise, or for explaining processes to take place. So on balance, heterogeneity is recommended as providing the best support for productive interaction and for the achievement of goals (Jaques, 2000). Heterogeneous groups may also be more effective at group decision-making than groups that are stratified by ability (Brown & Atkins, 1988). Obviously, ability can often only be judged in an approximate fashion, but grades for previous courses should provide a guide.

Cohesion and Familiarity
On the other hand, it seems that larger effects occur when group formation involves more than consideration of ability. Teachers' judgements of compatibility may also help groups to function well (Cohen, 1994). It is especially useful for teachers to be aware of group sociometry or the likely patterns of emotional linkage. As Jaques (2000, p. viii) points out: "Despite the pre-eminence of intellectual aims in learning groups it is often the emotional needs and undercurrents that are most powerful; yet these are most frequently neglected. The sense of identity and social belonging that a student can gain from a well-run group should not be underestimated". Lott and Lott (1965) endorse this by suggesting that group cohesion is essential for productive interaction, enhanced task performance, higher rates of learning, and positive self-evaluations.

Meyers (1997) recommends activities that promote cohesion such as open discussion of expectations, dispersion of leadership, and ice-breaker tasks. Smith (1980) further suggests that the best formulations include reference to the warmth and acceptance of the group and each individual member considering their own behaviour within the group. He also advocates inter-group competitions, although classical Social Psychology suggests perhaps that this should be utilised with caution! In online learning situations, McAteer, Tolmie, Duffy and Corbett (1997) suggest that it is better if participants know one another beforehand. In situations where this is not possible (such as distance learning), various steps can be taken to help the group get to know one another. Appendix 2 provides some suggestions of practical techniques that can be used to facilitate small-group learning in a variety of situations.

In the use of C&IT, it is not simply a question of getting to know the other students; there are also effects from prior experience and comfort with computers to take into account. Tolmie and Boyle (2000) report that students perform better when they are experienced at communicating under similar task conditions. Light et al. (1997) report similar age and experience effects. However, Clawson and Choate (1999) found that prior experience of newsgroups or the Web was not linked to a successful outcome but that students who were (self-reported as) comfortable with computers were more likely to participate in the online discussion. This makes the issue of training an important one. Although most authors provide some form of IT training (for example, Crook, 1997), it is commonly reported that in retrospect, more training should have been given - in computer use and in discussion skills online (ASTER, 2000; Clawson & Choate, 1999).

Students' response to the use of C&IT can also be crucial. Many authors report a positive response to the use of new technologies (for example, Anderson et al., 2000; Crook, 1997). Joinson (1998) reports the results of a final questionnaire for a Psychology course supported with the Internet and found that 99% of students thought use of the Internet was a useful skill to gain; 90% found it helpful to the course; 88% found it enjoyable; 85% found it easy to use; 76% thought it enhanced career prospects; 83% said it was better than just a textbook. However, students are not always positive, particularly if something unfamiliar is being introduced and they are not sure why. An appropriate strategy on the part of the tutor (p. 21) can overcome this (Bennett & Pilkington, 2001).

Participation and Combating Dominance

Most individuals in a group tend to be apprehensive of evaluation by others and monitor their own and others' behaviour (Sutherland, 1997). There are very marked individual differences in the extent to which group members are prepared to speak out, especially initially. Jackson and Prosser (1985) found that in most small groups of four or five, about half of the students engaged in the discussion while the other half listened but only played a minor role. Jackson and Prosser and others (for example, Karp & Yoels, 1976) have emphasised that domination by one or two individuals, with the consequence that the other group members do not participate, is a major problem.

This is not to say that non-participating students will fail to learn. When working with computers, the phenomenon of 'vicarious learning' has been described (Cox, McKendree, Tobin, Lee & Mayes, 1999; Gibbs, 1999; McKendree, Stenning, Mayes, Lee & Cox, 1998). The Vicarious Learner Project (McKendree et al., 1998) describes the fundamental role of dialogue for learning and the benefits to learners of observing others participating in discussion. In addition, the record left behind after a CMC session (for example, a text transcript of an online chat session) can be re-used by students for study and revision (Pilkington, Bennett & Vaughan, 2000) and by other learners facing similar tasks. Nevertheless, there are uncertainties, in both face-to-face and computer-mediated environments, about whether vicarious learning will inevitably occur (Howe, 1998), and questions must also be raised (see p. 15) about implications of having non-participating learners for students who do contribute.

Insofar as equalisation of participation is the ideal, there are ways of promoting this by structuring the activity and some example techniques are given in Appendix 2. Encouraging participants to brainstorm ideas has for example been shown to reduce the influence of dominant group members (Sutherland, 1997). Hara et al. (2000) describe the ‘starter–wrapper’ technique used for computer conferencing. One student is responsible for starting the debate, another for wrapping up, that is, summarising the discussion at the end. Students rotate these roles, which encourages both preparation and participation.

To bring more reticent learners out of their shells, Jackson and Prosser (1985) further suggest urging the class to mix and get to know each other before hand; they even made it an objective of the course to become acquainted with every other student in the class. Giordano and Hammer (1999) endorse this. They highlight the importance of acknowledging that some students may not like groups or may feel socially awkward participating in them. They stress that students who are initially shy will gain confidence as they get to know others in the group and become used to speaking in front of them, a point endorsed for online environments by McAteer et al. (1997) and Tolmie and Boyle (2000). Generally then groups need continuity to help them run smoothly, but as Giordano and Hammer (1999) point out, when a group is not working well due to interpersonal dynamics, there needs also to be a vehicle for effecting change.

Responses to a questionnaire administered by Jackson and Prosser (1985) indicated that students felt that their own attitudes towards participation needed to be improved and that departments should also get them to organise their own discussions. Clearly, the latter requires consideration, but it needs to be handled carefully since it could undermine the earlier points about ability groupings. It could also result in certain individuals being isolated. Perhaps the key issue is that with prolonged experience students will feel more and more comfortable acting in small-group situations in any case. A co-operative atmosphere takes the stigma out of getting help and is more likely to encourage those whose confidence is easily threatened. Training students in how to approach small-group work has been recommended (by for example, Gibbs, 1994; Martin & Campbell, 1999). Nevertheless with experience alone individuals can, according to Martin and Campbell, increase their communicative competence, their knowledge of how to behave in any given social context and their ability to select appropriate behavioural responses.

Enhancing Participation through C&IT

Many have suggested the use of C&IT to improve participation rates and encourage active engagement with course content, particularly in response to increasing student numbers (see for example, Anderson et al., 2000; ASTER, 2000; Bennett, 2001; McLeod, 1992). Anderson et al. (2000) describe the use of computer-based design tutorials to support face-to-face student discussions of proposed research projects. The computer acted as ‘chair’ of the discussion, structuring without providing content information. Anderson et al. found that the amount of time dedicated to discussing each student’s project was a predictor of that student’s further participation. Participation decreased over time but this did not affect the results for the remaining students, with those who participated most obtaining better marks for their final design exercise.

Some authors have suggested that the use of C&IT can reduce participation in classes. For example, Chong (1998) found that students using a computer conferencing system (introduced to promote small-group learning within large groups) were less likely to attend face-to-face classes although participation in the discussions increased. Chong suggests that this is due to students’ perceptions that if they can obtain the same information elsewhere, there is no need to attend classes. Crook (1997) on the other hand, providing interactivity in hypertext course notes such as bulletin boards for discussion of course topics, found that use of Web resources did not decrease attendance at face-to-face classes. These findings suggest that C&IT is most beneficial where it is used to 'add value' to a module, for example by providing online discussion facilities instead of simply repeating a function provided elsewhere.

The issue of student participation in online discussions is much discussed. Tolmie and Boyle (2000) suggest that practice often falls short of the ideal that can be achieved, mentioning that many authors report lack of participation, communication with tutors rather than peers or shallow interactions. Guzdial and Turns (2000) show that simply providing a discussion forum does not mean that it will be used effectively to enable learning (or at all!). Students may choose not to participate, particularly if collaboration is inconsistent with the instructional approach in class (for example, if grading is based on individual performance), or talk may be off-topic or too brief. Students' difficulties included not understanding the benefits of participation, feeling that other strategies would benefit them more, uncertainty about how to participate, different priorities, difficulty in keeping up with the discussion (a challenging task, especially for novices) and difficulty in formulating contributions (see also Bennett & Pilkington, 2001). Crook (1997) found that the bulletin board was not used at all by students. Focus group discussions revealed that no one wanted to be the first to use the bulletin board.

Effective discussions should be sustained and focused on topics related to the learning goals (Guzdial & Turns, 2000). To avoid some of the problems listed above, the tutor needs to provide guidance on appropriate use of the C&IT tools (Downing & Brown, 1997). The discussion must also be integrated into the curriculum (Bennett & Pilkington, 2001; Gibbs, 1999; Reeves, 2000). A suitable 'anchor' should be chosen for the discussion (Guzdial & Turns, 2000), for example, model examination answers, case studies, and other students' work. Finally students need to understand the tasks they are being asked to do (and why), have access to the necessary tools, skills and resources, and be appropriately rewarded (Bennett & Pilkington, 2001).

Summary

Summarising the above, research into student organisation seems to lead to the following recommendations for providing effective practice:

1. Arrange seats in a circle for face-to-face interaction; consider any requirements or restrictions imposed by the use of C&IT such as access to computer labs.
2. Try to restrict group size to a maximum of six students.
3. Do not worry unduly about gender and ethnicity when assigning students to groups.
4. Strive for mixed-ability groupings wherever possible.
5. Try to ensure group cohesion, by assignment practices (for example, friendship groups), and/or by relevant activities such as discussion of expectations, rotation of leadership and ice breaker activities.
6. Recognise that groups may take time to function well, but support the process by combating dominance and fostering familiarisation.
7. Ensure students are as comfortable as possible with any C&IT used through effective training and support.

The messages about size, social category, ability, cohesion and dominance seem as applicable to online groupings as they are to conventional face-to-face ones. Nevertheless, some of these messages pose challenges to the teaching of Psychology as practised and, perhaps more pertinently, resourced. Strategies for dealing with the challenge will be taken up in the report's concluding section.

Task Design

Reward Structure

The tasks that students undertake can be moderated in a variety of different ways. Therefore, it is important to consider how task arrangements can affect the communication between students (and tutors), and their perceptions of each other. All group members must believe their own and each other's contributions are important, and individuals will put less effort into the group task if they believe their contribution is not vital to the whole (Meyers, 1997). By contrast when students perceive their contributions to be original and significant, they continue to participate even if their work remains anonymous (Harkins & Petty, 1982).

Students' perceptions of their co-workers' contributions also influence their commitment. Individuals sometimes reduce their efforts to match the level at which they believe the other group members will be contributing when completing a given task (Chapman, Arenson, Carrigan & Gryckiewicz, 1993; Jackson & Harkins, 1985). Thus, students may withdraw their participation to avoid the possibility of being exploited by the others in the group (Kerr, 1983). This form of exploitation is referred to as 'social loafing'. Questions were raised earlier (p. 12) about the general utility of the vicarious learning that can take place in an electronic forum. Research suggesting that social loafing can reduce the commitment of participating individuals confirms the point made above that vicarious techniques should be used with care.

Recognising that groups need to be 'pulled together', one way to achieve this is by making members interdependent. Indeed, according to the motivational approaches that were discussed earlier, such interdependence is a necessity. Interdependence over goals and the resources to achieve these have been advocated by Johnson, Johnson and Stanne (1990). However, interaction is not guaranteed by either goal or resource interdependence: there is still the problem of motivating the group to interact and solve problems collaboratively. This is where reward interdependence comes in, for, according to Slavin (1983a, 1983b, 1987), achievement is enhanced when co-operating individuals are rewarded as a group. Group goals and collective outcomes provide students with an incentive to help each other and to encourage each other to put forth maximum effort.

The effectiveness of reward interdependence is well documented (for example, Johnson et al., 1990). However, in HE contexts this will typically bring groups into competition with other groups, and this raises a number of difficulties. Cohen (1994) states that the issue has become entangled in the ideological debate over co-operation versus competition, along with the issue of the merits of extrinsic versus intrinsic rewards. Cohen and others (for example, Bossert, 1988; Vedder, 1985) advance methodological criticisms of Slavin and advocate caution. It is accepted that competition can help some students, but it is not effective for all. Moreover, as Cohen (re-echoing classical Social Psychology) points out, "offering rewards on a competitive basis, although effective in increasing motivation of team members to work together, may have negative effects on inter-group relations, more specifically on the perceptions that team members have towards other teams", p. 14.

In addition it has been shown that "the failure of one's team can have a negative effect on one's individual achievement in a way that is independent of prior achievement and individual outcome" (Chambers & Abrami, 1991, p. 16). Some researchers further believe that the use of rewards may have undermining effects on long-term motivation (Cameron & Pierce, 1994). In a study (of school children) using computer tutorial packages, Fu-Yun (2001) examined the effects of competition between groups and found that co-operation without inter-group competition leads to better attitudes to the subject matter and more positive inter-personal relationships within and among learning groups than did co-operation with competition. The exchange of ideas and information within and among learning groups was more effective and efficient when there was no competition. The author therefore concludes that it is preferable not to introduce competition into computer-based collaborative tasks.

In a more recent paper, Slavin (1996) addresses such points. He acknowledges that there are a few cases in which achievement gains (in comparison to control groups) have been found for small-group learning interventions that lack reward interdependence and suggests that there may be conditions under which reward interdependence is unnecessary. The tasks he specifies as fulfilling the condition are controversial tasks without single answers, voluntary study groups and structured dyadic tasks.

Without doubt, more research is needed to establish the conditions where reward contingencies are and are not needed. Nevertheless, a number of points can already be made. First, most small-group contexts in HE Psychology probably do involve controversy, voluntariness and/or structured dyads, and therefore, on Slavin's (1996) analysis, would be exempt from the 'reward interdependence' requirement. Second, should exceptions exist, competition is not necessarily inimical to co-operation. Students need to understand that one group's gain is not another group's loss. One strategy is the use of criterion-referenced grading rather than norm-referenced grading, something that is typically endorsed within Psychology but not always achieved (MacAndrew & Edwards, in preparation). In addition, if reward contingencies are used wisely, students can be rewarded for relative improvement.

Controversial Tasks

Slavin's (1996) identification of 'controversial tasks' highlights a second crucial feature of task design, for there is now much research into the effects of controversy on group interaction and the growth of knowledge. Consistent with the ideas of Piaget (1932) on conflict as discussed earlier (p. 7), learning in groups structured by controversy has been shown to be superior to learning individually and in groups seeking concurrence (Smith, Johnson & Johnson, 1981). Cohen (1994) states that research into the benefits of controversy within co-operative learning provides the best example of the ways in which 'elaborate procedures' and the use of student roles can promote high-level discourse resulting in conceptual understanding.

A process is hypothesised by Cohen (op cit.) whereby controversy leads to conceptual conflict in students holding incompatible positions. This conflict, in turn, leads the adversaries to seek more information in order to clarify their positions. Slavin (1996, p. 59) suggests that setting high-level controversial tasks without single answers is especially beneficial as students "make overt their private speech, giving peers operating at a slightly lower cognitive level on a given task a stepping stone to understanding and incorporating higher-quality solutions in their own private speech". From a theoretical perspective, this is an interesting rapprochement between Piagetian and Vygotskyan thinking, which if correct could help bridge one of the gaps in conceptualisation that were identified earlier (see p. 5ff.).

As Cohen (op cit.) observes, controversial tasks are instances of what sociologists call 'ill-structured problems' and interaction around such problems is impeded by heavy intervention from tutors. On the other hand, it can be supported by computers. Anderson et al. (2000) used computer-based questioning to elicit debate between Psychology undergraduates planning their dissertations. Controlled evaluation revealed a significant impact on quality of discussion, student enjoyment and subsequent grades. Gibbs' (1999) coMentor and Guzdial and Turns' (2000) CaMILE are equivalent online facilities. Other authors (for example, Downing & Brown, 1997; Pychyl et al., 1999) use the posting of collaborative group products on the Web as a method of sharing with others and to enhance discussions.

Choice of Materials

The concepts of 'reward interdependence' and 'controversial task' both address students' orientation to the material with which they are engaging. There are, however, a number of issues to be considered in designing the materials themselves.

Group Dependency

Firstly, does the activity require group participation, or could it be completed by individuals? Many theorists are critical of tasks that are not inherently group-based (see Cohen, 1994; Slavin, 1996). A number of authors working on C&IT-based group tasks have described students splitting tasks between them rather than working collaboratively, with corresponding decreases in potential benefits. For example, Althauser and Matuga (1998) explored the value of having students work in groups on collaborative examination answers which were posted online for the benefit of the group and class. They found that if each student worked on only one question, opportunities for 'cognitive confrontation' were decreased, and gaps in the resulting resource resulted where individual students didn't pull their weight. Calvani, Sorzio and Varisco (1997) describe similar effects with the Web-based presentation of research papers.

Variety

Lou et al. (1996) found that the effects of group work were better when instructional materials were varied, i.e. when different groups of students undertook different tasks. It has also been suggested that having some kind of concrete object for students to manipulate can make a difference in the effectiveness of the group (Cohen, 1994). Computers can add variety, and surely not only as 'manipulable objects'. For instance, there is evidence that use of the Internet boosts motivation, increasing the relevance of the module to real life by anchoring it in the outside world, as well as to develop students' information skills (Downing & Brown, 1997; Joinson, 1998).

Task Difficulty

It has been found that undergraduates tend to perform better on difficult tasks in group contexts than they do individually (Jackson & Williams, 1985). Furthermore social loafing may be reduced, (and motivation enhanced) by increasing the difficulty of the task (Harkins & Petty, 1982). In well-defined routine tasks students tend on their own to engage in fairly low-level thinking and interactions (Cohen, 1994). Structuring from tutors can on the other hand play a compensating role, probably because the structure raises the level of discourse and ensures that disengaged students are drawn into participation (Cohen, 1994).

Personal Involvement

Social loafing has been eliminated in tasks that require high personal involvement, such as generating counter-attitudinal arguments (Brickner, Harkins & Ostrom, 1986). Other examples of small-group activities that are personal in nature include participating in personal growth groups or group therapy exercises (for example, DeVogue & Varble, 1976), pretending to solve marital or family problems (for example, Gardner, 1991), and reflecting on students' cultural backgrounds (for example, Enns, 1994). For successful use of CMC, a shared understanding of the task (Lewis, 1997) and a consensus on what is involved are major determinants of success (Calvani et al., 1997). Calvani et al. found that creating an online community of learners to promote learning was more difficult than expected!

Assessment of Performance

One frequently overlooked step in task design is the measurement of performance. The step is frequently overlooked because the tradition in HE (and Psychology is no exception) is to focus upon the summative achievement of individuals. Thus, insofar as group work is assessed, it is typically in the context of individual class examinations. Research which uses examination performance to evaluate the effectiveness of small-group teaching typically indicates that the approach is only as effective as other methods and more costly (for example, Dubin & Taveggia, 1968). By contrast, research which is geared towards the small-group task itself and measures the gains that the activity was aimed at achieving produce more positive results. These findings have important implications both for research strategy and for the assessment of students. To establish precisely what students have learned from small-group teaching, it is crucial to make evaluative procedures directly relevant to the group activity.

Individual Assignments

One possible assessment strategy is individual assignments (for example, essays or reports) that are directly derived from the group task (Giordano & Hammer, 1999). Responses to the aforementioned survey of Psychology HOD's (p. 4) suggest that this practice is widespread within Psychology, and it is certainly reinforced by authors in the field of C&IT. Reeves (2000) suggests that the use of online learning environments in HE creates a need for alternative assessment approaches. The assessment methods chosen must reflect the skills students are expected to acquire (Bennett & Pilkington, 2001). Reeves (op cit.) suggests adoption of cognitive assessment of higher order thinking abilities, attitudes and communication skills (for example, concept mapping, where students externalise the relationship between concepts; problem-solving skills, which could be embedded in Web-based learning environments); performance assessment (demonstrating capabilities and creating products or engaging in activity) and portfolios (for example, using Web facilities for production and presentation of online portfolios).

Assessment of Group Products

An alternative approach involves the assessment of group-produced assignments. This approach takes us back to Slavin's (1983a, 1983b, 1996) reward interdependence and the controversies discussed earlier (p. 15). One further issue is the resentment that students sometimes feel when group members become 'freeloaders' (Callaghan, Knox, Mowatt & Siann, 1994). Callaghan et al. argue that safeguards against such individuals benefiting unfairly have to be built in, for example, by using a profile (perhaps generated from the students themselves) of what each member has contributed. Yet even in the absence of such safeguards, they found that students rated assessed group work as preferable to non-assessed from the point of view of learning outcomes, although non-assessed group work was seen as preferable from the point of view of group dynamics. The issue of student perceptions is one that motivational theorists tend to overlook in their discussions (but see Walker, 2001).

Many authors describe group tasks involving the production of collaborative Web-based resources (for example, Bennett & Pilkington, 2001; Downing & Brown, 1997; Pilkington et al., 2000) but there is some disagreement over whether and how such products should be assessed. Downing & Brown (1997) considered that non-assessment of the group product (students being assessed by individual examination only) facilitated co-operative work and that giving individuals grades for collaborative project work would be virtually impossible.

However, this ‘conclusion’ is not borne out by other research on (online) group assessment. For example, Joinson (1998) describes Psychology students group production of a Web-based ‘poster’ representing 25% of the module mark.

Assessment of Group Behaviour

An alternative to the assessment of a group product is the direct assessment of group behaviour. This is rare within Psychology, but under discussion by LTSN (see, for example, Race, 2001) and growing in significance elsewhere. The primary issue is of course what to assess. Jackson and Prosser (1985, p.660) caution against assessment of the interaction itself, arguing that although this may be “a means to motivate the students to take (participation) seriously, it may more often than not have exactly the opposite effect”. In Jackson and Prosser’s case study, the assessment criteria were attendance, punctuality, and seeming preparation. Nevertheless, interaction is the core of what groups are about, and if this is ignored there is a danger that assessment of group behaviour may be seen as missing the point. In using online communication systems, a number of authors have recommended prescribing minimum participation rates for students. Hara et al. (2000) allocated 10% of the course grade for participation in online computer conferencing discussions. However, they found that although students met this minimum, they tended not to exceed it, which stilted the growth of the discussion, although individual contributions were generally of relatively high quality.

Material outlined earlier suggests that as regards interaction between students, the crucial elements are conceptual conflict and cognitive elaboration, but it is unclear how reliably these can be assessed. Tutors emerge from small-group sessions with intuitions about whether things went well or badly, but the extent to which these intuitions are based on relevant aspects of dialogue is uncertain. Online bulletin boards leave a record of the discussion, as do log transcripts from some online chat tools. However, assessment of these, particularly for a large class, can be time consuming for the tutor (ASTER, 2000). Research by Cheshire and Jenkins (1991) on the evaluation of small-group discussion at the secondary school level suggests that teachers perceptions of the extent of interruption had as much influence on the grades they assigned as the content of what was said. Training in the assessment of group interaction may help here, but even then there is the further issue of the tutor’s own contribution to the group. As noted earlier, it is not known at present how to theorise the relation between tutors and groups of students, meaning that training can not be based on a secure body of knowledge.

Peer Assessment

Tutors can of course say nothing about interaction during face-to-face structured activities or group projects in which they do not participate. Here, responsibility for any assessment of behaviour would have to lie with students, and this would of course be consistent with an agenda of encouraging autonomy and active engagement. In fact, self assessment (where students assess their own work) and peer assessment (where students on a course or module mark each other’s work) are currently increasing in popularity (Race, 2001), particularly in relation to the assessment of group work.

Nevertheless, caution needs to be exercised. Burchfield and Sappington (1999) note that students’ self-assessments of group contribution tend to be higher than peer- or tutor-assessments. Furthermore, they do not correlate well with peer or tutor assessment, although interestingly the latter two agree substantially. Other authors write more positively about peer assessment (see for example Topping, 1998, for a good review of this area). Race (2001) gives a practical overview of the area of self, peer and group assessment.

Summary

Five recommendations seem to follow from the above, and importantly they seem just as applicable to online interaction as they do to face-to-face:

1. Ensure that groups are interdependent in the achievement of goals and the procurement of relevant resources.
2. Appreciate that rewarding the group as a whole for good performance may not be necessary to optimise the outcome of most HE group work in Psychology. On the other hand, group rewards are appreciated by students, and may not undermine performance even when they are non-essential.
3. Choose tasks that are likely to generate controversy, and minimise tutor intervention in such tasks.
4. Ensure that tasks are genuinely group-based, intellectually challenging and personally engaging. Recognise the need for greater tutor involvement when these criteria are not fulfilled.
5. Consider the issue of assessment. Do not place too much reliance on the assessment of group behaviour but ensure that the value of the activity, and the effort involved, is understood by students. Evaluation of dialogue or interaction is not recommended as the only form of assessment.

To the extent that the third and fourth recommendations are met, the first and second are probably minimised in importance. Nevertheless, as noted earlier, the first and second recommendations need not cause ideological rifts if handled sensitively, and are not necessarily inimical to the third and fourth.

Tutor Support

Productive Behaviour

Finally, the role of the tutor must be examined. This of course has been an implicit theme in everything that has gone before, since it is the tutor who frequently makes decisions about the distribution of students to groups and the tasks they will perform within groups. However, these issues relate to the indirect role of tutors. The concern now is with their direct role as interacting members of the group, and there is no doubt that how they perform this role matters. All of Ramsden's (1992) 'thoroughly predictable outcomes' of group discussion represent problems with either student participation or poor quality interventions from tutors. It is unsurprising therefore that tutor behaviour has been seen to interact with student and task factors in much of the material discussed above. Yet tutors find it hard to change their habits, and even worse, may not realise that their habits need changing in the first place. According to Entwistle and Ramsden (1983, p. 3), "lecturers tend to think that the context or environment of student learning is not of great importance: they attribute success or failure to the characteristics of the student, not to their teaching". For readers versed in the social psychology of causal attribution, this will not seem entirely surprising!
Ideas about productive tutor behaviour have developed from the Vygotskyan tradition that was outlined earlier (p. 5). As was explained, the central concept of the Vygotskyan account is that learners can perform at higher levels working in conjunction with more expert others, who help direct their activity, than they can on their own. Learning occurs via the appropriation or internalisation of actions initially performed under expert guidance, and of the meanings associated with these. Wood (1986) in particular has helped to flesh out how such guidance might take place through the process of 'contingent support'. This entails the expert intervening to steer the behaviour of the learner only when they falter, and then at the most non-directive level that will achieve the desired result (i.e. prompting rather than instructing), since leaving as much as possible to learner aids the process of appropriation.

Such ideas have led to HE group work being conceptualised in terms of stages or tasks, and recommendations made about optimal interventions at each point. Brown and Atkins (1988) see tutor skills as involving questioning, responding, explaining, summarising and closure. Consistent with Wood (1986), explaining is seen as something that comes after the task is completed, and then only if less direct follow-ups have failed. Baumgart (1976) by contrast focuses on the various tasks that tutors perform, for example, instructor, commentator, stage-setter, prober, and 'reflexive judge'. From observational data obtained by Baumgart, the latter seems to be crucial. The 'reflexive judge' appraises contributions and probes, and these behaviours are highly predictive of student 'thoughtfulness', i.e. interpretative, evaluative, and speculative utterances. Student ratings were positively correlated with displays of 'thoughtfulness'. Giordano and Hammer (1999) note the importance of not restating the information that groups report, claiming that such restating by the tutor only teaches the class that anything important will be said by the tutor, discouraging participation and learning from others' contributions. Corresponding to what Edwards and Mercer (1987) found in primary school classrooms, this temptation can be hard for HE teachers to avoid.

Expertise and Dominance

One specific danger is tutor domination of group interaction. Consistent with Piaget (1932) there seems to be antipathy between tutor directiveness and student interaction. Cohen, Lotan and Leechor (1989) found significant negative correlations between the degree to which tutors used direct instruction when students were working in groups and the degree to which the students operated collaboratively and discussed their work. These effects seem to be directly related to the expertise (perceived or otherwise) of tutors: Silver and Wilkerson

(1991) found that when tutors described themselves as ‘experts’ they were directive during tutorials, dominated the conversation more, gave more direct answers to students’ questions and suggested more of the topics for discussion themselves, with tutor-to-student exchanges inevitably predominating. Moust and Schmidt (1994) observed that, compared with postgraduate tutors, academic tutors used their discipline expertise more and displayed more authoritarian behaviour.

Rogers (1986) noted that HE tutors often have difficulties with ‘the social sensitivities’ needed to encourage easy communication within the group, i.e. awareness of group members’ non-verbal as well as verbal interactions, awareness of group (or individual) tension and its release symptoms (jokes, laughter, etc.). Moust and Schmidt (1994) found that postgraduate tutors were better than staff at appreciating such matters, and were more interested in general in students’ daily lives, study experiences and personalities. They were also better at understanding students’ difficulties with grasping material, and were more likely to refer to assessment (for example, end-of-course examinations) to direct student learning. On the other hand, Davis, Nairn, Paine, Anderson and Oh (1992) found that groups led by ‘content experts’ had higher levels of satisfaction and higher examination scores. The implication is that stereotypes of postgraduates as less equipped than academic staff to deliver the material undermine their effectiveness, even when they engage in behaviour that is actually conducive to learning

Tutors and New Technology

The use of new technologies (the Internet, CMC and other computer-based activities) and new methods of working (group-based activities) can significantly change the role of the tutor. The use of online virtual learning environments (VLEs) can facilitate a shift away from traditional lectures towards more group work in face-to-face sessions (Gibbs, 1999). In these cases, a key role for the tutor can be in making sure students understand the reasons for, and benefits of, the use of innovative methods (Bennett & Pilkington, 2001). Many authors describe a change in the tutor’s role from instructor to facilitator (Downing & Brown, 1997); from expert presenter of information to discussion facilitator and manager (Brandon & Hollingshead, 1999), which requires a different set of teaching skills (for example, Berge, 1995). The tutor becomes a coach, scaffolder and colearner (Kang, 1998). The tutor should model appropriate behaviour, give detailed feedback, be clear about evaluation and grading and structure the task appropriately (Chong, 1998). There should be an awareness that teachers’ attitudes rub off on students, including teachers’ computer phobia (Bennett, 2001).

The introduction of computer-based methods can affect tutor time. Pilkington, Bennett and Vaughan (2000) found that with the introduction of a VLE, there were additional overheads for course development and student contact time, but benefits for tutor included more motivated students participating in an active learning community, making the course more enjoyable for all involved. Crook (1997) and other authors (ASTER, 2000) report a similar increase in demands on tutor time. Gibbs (1999), also using a VLE, recommends limiting the call on tutor time by encouraging student to use the CMC facilities to contact each other and other sources first before contacting the tutor. New communication methods have never been rapidly adopted into teaching and learning (Winston, 1986). Historical studies of HE show that resistance to change is caused by perceived high administrative and cultural barriers (Cuban, 1999). Bennett (2001) found the main barrier to be lack of time.

Tutors using C&IT will require expertise with the technology as well as with the subject matter that they are teaching. Dearing (1997) states that for C&IT to be fully and successfully integrated, staff need to be skilled in the management of learning through C&IT. Different tools serve different instructional purposes and tutors should consider what they want to achieve before implementing innovation. It is also necessary to test and know the system thoroughly before using it (Hara et al., 2000). The availability of support, for staff and students, should also be considered.

Bennett (2001) in a survey of UK lecturers found that most preferred to seek information and support from informal sources (for example, colleagues) rather than formal sources (for example, postgraduate courses, staff development workshops). According to Guzdial, Rick and Kehoe (2001), the potential learning benefits of the Web are not exploited because it is difficult for teachers to construct interactive, collaborative Web-based activities. Despite some of these potential difficulties, computer conferencing systems can provide opportunities for instructors to gain insights into student learning processes, through opportunities for review and reflection (Chong, 1998).

Summary

To summarise, the main recommendations emerging from the above are:

1. Be aware that tutor behaviour matters.
2. Act as a ‘reflexive judge’ while avoiding re-statement of what students say.
3. Avoid authoritarian behaviour and group domination in the interest of promoting productive interaction between students.
4. Recognise that students may hold adverse stereotypes of postgraduate tutors, despite the latters’ productive style of teaching.
5. Consider the potential role changes that the use of C&IT may bring and be prepared to act as facilitator rather than instructor.
6. When using C&IT, avoid increased tutor time requirements by laying appropriate ground rules and fostering a learning community where students turn first to each other for help.

Conclusions

The above discussion of student organisation, task design and tutor support signifies a rather complex message for a ‘good practice model’. First, it is clear that the *meaning* of small-group activity is as significant as the activity itself. Rewarding group performance (by, for example, grades) should not be necessary given the contexts within which group work typically occurs, but students perceive rewards to be helpful and this may matter. Postgraduate tutors are more effective than academic staff at facilitating productive interaction, but their impact may be nullified by unfavourable student perceptions.

Second, the relevant factors interact, such that what is productive in one context may be unhelpful in another. When the task is demanding and controversial, tutor intervention should probably be minimal and extrinsic rewards are unnecessary. When the task is mundane, tutor intervention is essential, and rewards may be helpful. Mixed ability arrangements stimulate debate and are probably helpful for the majority of students, but middle-of-the-range individuals may gain more from homogeneous arrangements.
On the other hand, while the message is complex, it does raise important issues for UK

Psychology as currently practised. For instance, the research suggests that group size should not exceed around six students per tutor, when nearly half of UK Psychology Departments use groups of 21 or more. The implication from the research is that when resources allow six students or fewer, the traditional tutor-directed model can be continued so long as attention is paid to seating arrangements, student ability, familiarisation and cohesion, task appeal, and the tutor's own style of interaction. For groups of more than six students, the traditional model is probably a waste of time, and alternative approaches should be adopted. The best strategy might be to choose tasks that are genuinely group-based, intellectually challenging, personally engaging and controversial. Students should work on the tasks with minimal intervention from academic staff, the role of the latter being limited to introduction, advice upon request and (possibly) assessment. There should definitely be a group product as the output from the activity. Appendix 2 provides some practical suggestions for achieving these aims.

Work by Downing and Brown (1997), Pychyl et al. (1999) and Joinson (1998) suggest that when a group product is required, the production of a Web resource for other students to inspect may be especially profitable. This is possibly because work via or around computers is known to be particularly conducive to the generation of ideas (Finholt & Teasley, 1998; Strauss & McGrath, 1994). Looking at computers more generally, it can be concluded from the above that the principles governing their use are probably no different from the principles governing traditional approaches. It is rather that following the principles is sometimes easier, due for example, to reduced tutor dominance, and sometimes more difficult, due for example, to technical challenge or lack of familiarity. However, additional issues such as training, support and access must always be considered when using new technologies.

It is impossible to say whether one of the two models described above is better, i.e. whether well-resourced departments should on occasion follow the second ('group work') model or whether less-favoured departments should lobby for more resources to provide more traditional small-group teaching for their students. Indeed, it is impossible to be certain about many issues, not simply because the research is inconclusive but also because, as stressed throughout, we do not at present have an adequate theory. However, this of course flags up an opportunity in psychological circles. When planning small-group teaching, be mindful of the theoretical relevance of what you are doing. Moreover, evaluate outcome in a controlled, theoretically driven fashion. And whatever you do, tell us what you find.

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Appendix 1: C&IT Tools and Resources for Psychology Small-Group Activities

A wide range of C&IT tools and resources are now available to staff and students in HE and these can be used to good effect to support and enhance small-group learning and teaching. They can be used before, during, after, or even in place of a face-to-face session. The ASTER Project Web site[1] provides comprehensive information on the use of C&IT in small-group activities. Some of the currently available C&IT tools and resources are described below.

- **Electronic communication tools** can be *asynchronous* (participants can contribute at any time) or *synchronous* (participants must be online at the same time). Examples include e-mail, bulletin board discussion lists, chat, groupware systems and videoconferencing.
- **The Internet and Web** provide access to information, resources and tools worldwide via a Web browser.
- **Virtual Learning Environments** (VLEs) provide an integrated collection of facilities designed to support a course, usually including e-mail, discussion facilities, course notes, assessment facilities, course management and administration features.
- **Simulation software** applications can help students visualise complex concepts or phenomena, or perform virtual experiments.
- **Virtual or multimedia resources** (with or without added pedagogy or imposed structure) include multimedia tutorials and other presentations and digital resources. They integrate text, graphics (simulation, video, animation) and audio to present material to students. Assessment, data presentation and analysis components may also be incorporated. They may be provided on CD-Rom or via the Internet.
- **Computer-aided assessment** (CAA) systems can be used for formative assessment, providing feedback to students at the point of need, and also for summative assessment, automatically delivering questions to students and, in some cases, collecting and marking the answers.
- **Presentation tools are software** applications that can be used to present textual and graphical material and information, for example, Microsoft's PowerPoint.
- **Analytical Tools** are software applications which have been written to perform analysis on data, for example, statistical packages and text analysis tools.
- **Advanced technologies** are being developed, for example, intelligent agents which can be used for group management and support (Whatley, Staniford, Beer & Scown, 1999).

Appendix 2: Small-Group Activities

Many different activities can be used to enhance small-group teaching and learning. The selection suggested here can be used as ice breakers, to encourage student participation, to improve motivation or just to add variety to group learning situations. They have been adapted from a number of sources including Habeshaw, Habeshaw and Gibbs (1992), Fry, Ketteridge and Marshall (1999), Jaques (2000) and Maier and Warren (2000). There are numerous variations possible and many of these activities are as suitable for the online learning environment as for the face-to-face situation. The suggestions for further reading given at the end of this section provide additional practical small-group teaching ideas and activities.

Debates	Students take a role in a scenario and argue from this position. Debates can also work well online.
Brainstorming	Group members generate as many ideas as possible on a theme. There is no criticism or judgement in the initial idea generation phase. The aim is to generate a large quantity of ideas (however wild), building on others contributions or combining them to produce new ideas. The idea generating phase may be followed by an evaluation phase. Brainstorming for idea generating can work well online. However, reaching a consensus decision online can be harder than when meeting face-to-face.
Buzz groups	Within a larger group (for example, a lecture), group members briefly discuss an issue or question in small groups (pairs or threes). Buzz groups usually work best in face-to-face situations. (In online groups, the delay between contribution and response decreases the ‘buzz’ effect, and the high volume of short messages generated can be hard to manage.)
Circular questioning	Sitting in a circle, students take turns to ask the person sitting opposite a question. In order to avoid superficial questions, time can be allocated for question composition beforehand.
Crossover groups	This is a variation on feeding back to a single plenary after a small group discussion. Allocate successive numbers or letter of the alphabet to students in each initial discussion group. At the end of the discussion, the students ‘cross over’, forming new groups for reporting: ask all As to group together, all Bs etc.
Delphi technique	To reach consensus on an issue, written views are collected separately from all participants, analysed and summarised and fed back to the group. All participants can reconsider and send in additional contributions. This is repeated as many times as necessary.

Fishbowl	The group is divided into an inner and outer group. The inner group discuss a topic (cognitive skills) while the outer group watch and listen and look for themes, patterns, quality of the argument etc. (meta-cognitive skills). This can work well online (a separate forum may be created for the outer 'listening' group). There are many variations: **Reverse:** swap the groups without feedback. **Empty chair:** have an empty chair in the inner group which any member of the outer group can take to ask a question or briefly input to the discussion. **Alter ego:** a student from the outer group can tap an inner person on the shoulder and put their point in a different way. **Paired feedback:** students from the inner and outer groups are paired. During the group discussion, pause for paired discussion then resume the original discussion. Members of the inner group can then integrate the comments from the outer group.
Jigsaw	In the jigsaw technique (Aronson, Blaney, Stephan, Sikes & Snapp, 1978), a number of (related) topics are chosen, or a topic is divided into sub-areas. Students work in small groups (of five or six) with each student in the group allocated a different topic. They study their topic in advance, then group with others studying the same topic to consolidate their findings. Finally students rejoin their original groups (each group now contains an 'expert' on each topic) and report their findings. For example, in a class of 25 students, 5 topics would be chosen and students would discuss in groups of 5.
Line-ups	Students are asked to take a point on a line which represents their position between two extremes. They must negotiate the position with others in the line to ensure they occupy in the correct place.
Nominal group technique	This is similar to the Delphi technique but ideas are collected face-to face. Individuals then respond on paper with short written phrases. The facilitator collects one idea from each participant until all are collected, recording them on a flipchart (or similar). The ideas are labelled alphabetically for identification. After a time of open discussion, these are prioritised. Each student is given between 1 and 5 cards on which to write the letter identifying an idea followed by its numerical ranking. The results are then collated.
Rounds	Each member of the group has a set time to contribute. Participation rotates around the group, or as a variation, the speaker chooses the next speaker. This can also work well online.

Snowball groups (Pyramids)	Buzz groups are progressively doubled in size so the discussion is between pairs, then fours then eights, groups finally reporting back to a plenary. This activity may start with an individual task. To avoid boredom, the task can be made progressively more complex. For example, individuals write or reflect on an issues, share their ideas in pairs, look for patterns or suggest possible courses of action in fours and finally develop principles or make recommendations in eights which can be reported back to the whole group.
Starter–wrapper	Hara et al. (2000) describe this technique for computer conferencing, but it could also be used face-to-face. One student is responsible for starting the debate, another for wrapping up, summarising the discussion at the end. Students rotate these roles, encouraging preparation and participation.
Syndicates	Students work in small groups (of five or six) on a joint assignment requiring reading, discussion and written work. Either the tutor prepares the assignments or topics may be chosen by the group and negotiated with the tutor. Within each group students distribute the tasks amongst themselves and meet during face-to-face time to work on the task. During this time the tutor circulates. Outcomes from each group are presented in plenary sessions. Syndicates work well online and are often used to produce collaborative Web resources. Each group should have its own CMC forum for private discussion.
Three minutes each way	A short activity similar to buzz groups. Working in pairs, one student talks for the set time while the other listens. They then swap roles.

Further Reading

Teaching and Learning in Small Groups.
Sandra Griffiths in *A Handbook for Teaching and Learning in Higher Education. Enhancing Academic Practice.* Heather Fry, Steve Ketteridge and Stephanie Marshall. London: Kogan Page, 1999.
This chapter gives a basic overview of the issues to consider when embarking on small-group teaching with some practical suggestions.

53 Interesting things to do in your seminars and tutorials.
Sue Habeshaw, Trevor Habeshaw and Graham Gibbs. Bristol: Technical and Educational Services, 4th Edition, 1992.
This is a 'dip-in' book full of practical ideas, techniques and activities to enhance all types of small-group teaching and learning situations.

Learning in Groups. A handbook for improving group work.
David Jaques. London: Kogan Page, 3rd Edition 2000.
This book provides comprehensive coverage of using groups and group activities in HE, including theoretical as well as practical considerations. It includes a short section on possible solutions to group problems.

Integrating Technology in Learning and Teaching.
Pat Maier and Adam Warren. London: Kogan Page, 2000.
This practical guide to integrating C&IT into teaching and learning in HE includes useful activities to help you consider your own teaching and the successful use of learning technologies

E-Moderating. The Key to Teaching and Learning Online.
Gilly Salmon. London: Kogan Page, 2000.
This book provides some useful practical advice on 'e-moderating', or teaching online using CMC. It includes a walk-through of the practical questions to consider before embarking on online teaching.

'Ask aster'
The ASTER Project, 2002.
Available from http://cti-psy.york.ac.uk/aster/ask_aster/ask_aster.html
This online resource provides information in response to frequently asked questions concerning the use of C&IT for small-group learning and teaching.

Learning to Teach. Running tutorials and seminars.
David Baume and Carole Baum. Oxford: Oxford Centre for Staff Development, 1996.
Aimed at postgraduates involved in undergraduate teaching, this is a practical booklet which covers all stages from planning to executing small-group teaching. It includes a useful section on preventing or dealing with 'difficult incidents'.

Learning in Teams. A student guide.
Oxford: Oxford Centre for Staff Development, Revised Edition 1994.
This booklet, aimed at students, provides guidance on getting the most from group learning situations.

A Briefing on Self, Peer & Group Assessment. Assessment Series No. 9.
Phil Race. York, LTSN Generic Centre, 2001.
Available from http://www.ltsn.ac.uk/genericcentre/
This briefing paper (part of a series on different aspects of assessment) provides an overview of current thinking on assessment of groups and group work.

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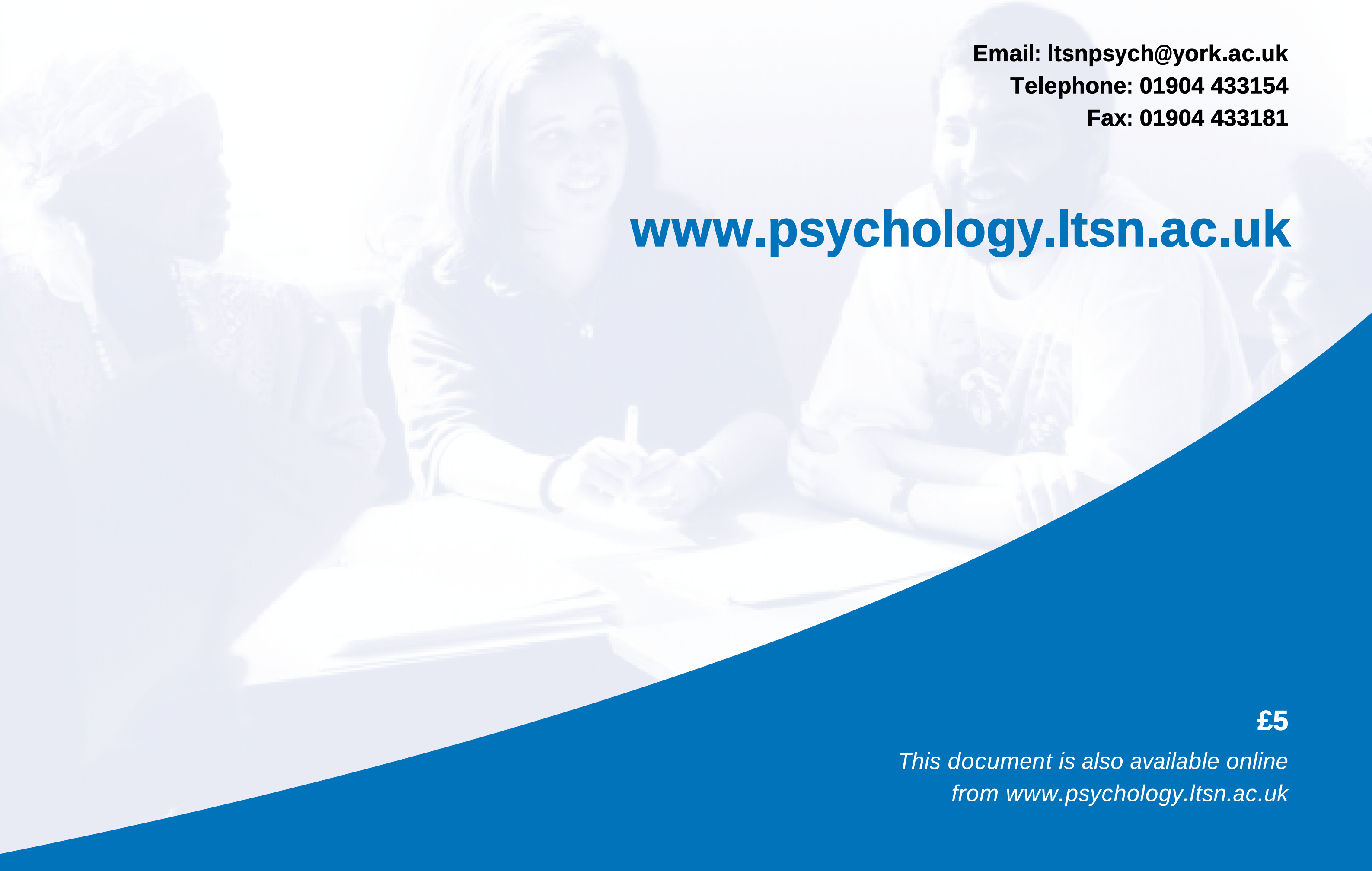

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