

Peer Assisted Learning: A Framework for Consultation

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In this article we explore ways in which the development of peer assisted learning (PAL) interventions can enhance the work of educational and psychological consultants. The range and scope of PAL strategies are reviewed, although the main focus is on simpler methods that are relatively easy and swift to implement. Organizational dimensions on which PAL interventions can vary are then explicated. Essential practical elements in the successful organization of local PAL programs are discussed. A model is provided of the routes and channels through which PAL strategies have their effects. This conceptual framework should help consultants illuminate the relevance of PAL to particular local needs, and promote the development of PAL into forms adding most educational value. Ways in which this framework might be applied in practice are explored. The interested reader is referred to more detailed sources and resources.

Peer assisted learning (PAL) is a generic term for a group of strategies that involve the active and interactive mediation of learning through other learners who are not professional teachers. Peer tutoring is the most obvious example, but there are many varieties of peer tutoring, and PAL extends far beyond peer tutoring.

PAL is characterized by:

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- Helpers consciously assisting others to learn, and in so doing, learning themselves.
- Helping that is complementary to professional teaching, but that definitely do not surrogate professional teaching.
- Helping that is structured to ensure gains for all participants in one or more domains.
- Helping that is available to all on an equal opportunity basis, because all have something to give.
- Helping that is carefully organized and monitored by professional teachers with an extended conception of their role. (Topping & Ehly, 1998, p. xiii)

Thus, PAL can be briefly defined as the development of knowledge and skill through explicit active helping and supporting among status equals or matched companions, with the deliberate intent to help others with their learning goals. It can be construed as a distinct subset of the wider field of “cooperative learning,” or as a separate but related field. Within this overarching principle, PAL includes a number of different methods: peer tutoring, peer modeling, peer education, peer counseling, peer monitoring, and peer assessment.

PAL strategies are very well researched, with a substantive evidential basis for effectiveness in terms of raising achievement, fostering social and emotional gains, and often also developing transferable interpersonal skills. Although effectiveness is of course linked to implementation quality, PAL methods are typically also both adaptable and durable, applicable in many different contexts and situations. This effectiveness and flexibility is usually coupled with low implementation costs, so it is unsurprising that PAL has long been noted to be among the most cost-effective of learning strategies (e.g., Levine, Glass, & Meister, 1987).

As consultants engage in collaborative problem solving and organization development with educators and support professionals, they must respond to the realities of life in classrooms. Although much of the consultant's role is to facilitate considered reflection in people and organizations and catalyze processes of problem definition, they also need an armory or menu of prompts and suggestions about ways forward. These strategies should be evidence-based and likely to maximize the effective deployment of scarce resources, while being readily absorbed, customized, and owned by their consultees.

PAL constitutes a dynamic, robust, flexible, and effective array of approaches that are worth adding to the repertoire of any educational or psychological consultant. Such consultants might help schools and other

organizations with initial awareness raising about PAL strategies and their potential use and effects, the design and planning of PAL interventions, the formative monitoring of implementation integrity of PAL programs while in operation, and the summative evaluation of program impact in the target domains. After initial success, the consultant is likely to contribute to processes of consolidating, embedding, and extending PAL.

The practice of consultation typically addresses both content and process issues (e.g., Gutkin & Curtis, 1999; Zins & Erchul, 1995). Although models of instructional consultation provide the conceptual structure to guide the consultant's work with teachers, the content elements of the ensuing intervention package are negotiated to be specific to the local context and needs. Although it is impossible here to detail all the practical issues involved in implementing each PAL strategy, this article offers such an overarching model for consultation.

In this article, examples of PAL interventions that can enhance the work of educational and psychological consultants are explored. The range of PAL strategies is reviewed, although the main focus is on simpler methods that are relatively easy and swift to implement. Organizational dimensions on which PAL interventions can vary are then explicated. Next, essential practical elements in the successful organization of local PAL programs are discussed. A summary model is provided of the routes and channels through which PAL strategies have their effects. This conceptual framework should help consultants illuminate the relevance of PAL to particular local needs, and promote the development of PAL into forms adding most educational value. Finally, ways in which this framework might be applied in practice are explored, and the interested reader is referred to more detailed sources and resources.

TYPES OF PEER ASSISTED LEARNING

Peer Tutoring

The most widely known PAL method, peer tutoring, often targets skill gains, and frequently achieves them. However, wider gains can accrue (Cohen, Kulik, & Kulik, 1982; Ginsburg-Block, Miller, Rohrbeck, & Fantuzzo, 1999; Sharpley & Sharpley, 1981; Topping, 1992). Peer tutoring is characterized by specific role taking: at any point someone has the "job" of tutor while the other (or others) are in role as tutee(s). It typically features high focus on curriculum content. Projects often also outline procedures for inter-

action, in which the participants are likely to have training that is specific or generic or both.

Although some peer tutoring methods scaffold the interaction with structured materials, others prescribe structured interactive behaviors that can be effectively applied to any materials of interest that happen to be available locally (e.g., Glynn, 1996; Topping, 1998, 2001b). Further, beyond traditional cross-ability fixed-role peer tutoring, reciprocal peer tutoring in same-ability pairs has also been found effective (Fantuzzo & Ginsburg-Block, 1998). Although much early peer tutoring work concentrated on basic skill areas, recently there has been more interest in peer tutoring in more complex and higher order skills, including thinking skills (e.g., the “Paired Reading and Thinking” approach of Topping, 2001b).

The gains from tutoring for the tutors themselves have been increasingly emphasized. Scruggs and Mastropieri (1998) reviewed the effectiveness of peer tutoring with tutors and tutees with special needs, and concluded:

- Students with special needs benefit academically whether tutees or tutors.
- Tutors benefit less academically if there is no cognitive challenge for them.
- Participants benefit more if carefully selected and trained.
- Participants benefit more if progress is continuously monitored.
- Improved attitudes to the curriculum area are frequent.
- Improved interactions with partners outside tutoring sessions are frequent.
- More generalized attitudinal or interactive gains are less consistent.

These findings are very similar to the research findings for students without special needs—the differences perhaps being of degree rather than nature. Maher, Maher, and Thurston (1998) found deploying disruptive students as tutors effective in improving the tutors' achievement and behavior, as well as advantageous for the tutees. Moreover, peer tutoring has been found effective on a large scale with tutors as young as kindergarten or first grade (5–6 years old; e.g., Fuchs, Fuchs, Mathes, & Simmons, 1997; Mathes, Howard, Allen, & Fuchs, 1998).

Finally, it should be noted that confusion between “tutoring” and “mentoring” is evident in the literature, not least owing to differences of language use between different authors in different countries. In the U.S., the terms are sometimes used as if synonymous, but a sharp distinction can be made between them. Mentoring can be defined as an encouraging

and supportive one-to-one relationship with a more experienced worker (who is not a line manager) in a joint area of interest. It is characterized by positive role modeling, promoting raised aspirations, positive reinforcement, open-ended counseling, and joint problem solving. It is often cross-age, always fixed-role (although the mentor might gain something also), quite often cross institution, and often targeted on disadvantaged groups.

Peer Modeling

There are elements of peer modeling in many PAL strategies, but peer modeling can also be deployed independently (Schunk, 1998). Peer modeling is the provision of a competent exemplar of desirable learning behavior by a member or members of a group with the intention that others in the group will imitate it. Peer modeling is likely to be associated with stronger identification between intended imitator and model than is modeling on professional adults—the teacher is too distant a mastery model. Peer modeling might also be more concrete than that from the teacher, and more salient to the imitator's everyday life. It might be particularly powerful with predominantly visual rather than verbal learners. Peers can also model the social and affective components of learning—such as enthusiasm and co-operation and show that something is possible. Peer models are competent but not necessarily perfect.

It follows that peer modeling is likely to be associated with attributions of success to effort, rather than to chance or factors beyond the learner's control. There might also be gains in self-image for the model—imitation is the sincerest form of flattery. Observing others gives the observer time and space to perceive the elements of competent performance with a clarity that might not be evident to the performer themselves (the latter being pre-occupied with the business of actually performing). Observing how others do things can heighten awareness of how you do things, through comparison and contrast. Modeling on and by peers might thus lead to greater metacognitive awareness, and thereby more self-regulation.

Peer Monitoring

Teachers do not have enough time to monitor all children closely. Peer monitoring involves peers observing and checking whether their partners are engaged in appropriate and effective processes and procedures of

learning—study or learning behaviors. For younger children simple indicators like time engaged with task, time on task, or just time in seat are relevant. More complex learning behaviors could include managing time and workload, doing appropriate reading, meeting deadlines, and so on.

Of course, some children will be quite aware that they spend very little time on task, and this might be a deliberate strategy or a conscious goal. For such children, peer monitoring alone is unlikely to have a profound impact. However, other children are likely to be unaware of the (often large) amount of time they spend off task, and credible feedback about this could itself be effective in producing greater effort toward self-improvement in the monitored child. Again, there are metacognitive implications—feedback from peer monitoring might enable the learner to better self-regulate their actions toward the desired goal. Also, practice in checking for off-task behavior in others might tend to sensitize the monitor to off-task behavior in themselves.

Peer monitoring can encompass both verbal and nonverbal behaviors. Even students with learning disabilities have been found to be reliable in collecting quantitative peer monitoring data (McCurdy & Shapiro, 1992). Reciprocal peer monitoring has also been shown to be effective with students as young as first grade. There is good evidence that the process of monitoring the academic performance of others can improve the monitor's own on-task behavior and academic skills. Monitoring by peers, teachers, and paraprofessionals has been found to be equally effective (see Brown, Topping, Henington, & Skinner, 1999; Henington & Skinner, 1998, for recent reviews).

Peer Assessment

Peer assessment is an arrangement for peers to consider the level, value or worth of the work, products or outcomes of learning of others. This might often be written work, although there are many other possibilities. The feedback from peer assessment is intended to be formative—enabling the learner to improve performance. Peer assessment can be given when a learning product or output is in the development stage, rather than at the end (when it is too late). It can be given more frequently and immediately than teacher assessment. Like other PAL methods, peer assessment is reflexive, and focuses the peer assessor's own mind on what actually constitutes “good” work in the area. A clearer view of “what you have to do to be right” is likely to improve assessed performance, especially when the criteria for assessment have been discussed or negotiated with all participants. Peer assessment can thus be a vehicle for improved self-assessment.

When peers interact to assess one another's work, the purpose is almost always formative. The expectation is that the quality of the work of both assessor and assessed will often improve as a result of the thinking involved and feedback provided. Peer assessment is often reciprocal, members of a pair operating in both roles. Students may improve their skills in critiquing or evaluating their own work (self-assessment) as a result of their interactions during peer assessment (Towler & Broadfoot, 1992).

The reliability and validity of peer assessment might be less than that of teacher assessment, especially if the assessors are young or inexperienced learners. However, peer feedback is usually available in greater volume and with greater immediacy than teacher feedback, which might help compensate for any quality disadvantage. Nevertheless, the provision of clear guidance or assessment criteria and close teacher monitoring and quality assurance are essential. It is also important that the purpose of the assessment is made clear, because if peer assessors think their verdicts have "high stakes" implications, they are likely to err on the side of leniency and abandon any attempt to be creatively critical.

A number of studies have demonstrated the benefits of peer assessment of writing in the form of peer response groups or as a component of peer editing. Several studies have found peer editing to be at least as effective as teacher editing, including in the lower grades and in special education classrooms. It is also used with classes learning English as a second language (ESL) and foreign languages. A smaller number of studies of peer assessment alone found the same (see O'Donnell & Topping, 1998, for a recent review).

Students often feel that assessment is something that is "done to them"—they have limited understanding of what the parameters of a good performance might be, let alone feel at all in control of them. Class discussions to formulate consensual criteria for peer assessment can be very enlightening in this regard. Peer assessment gives students a chance to understand the goals of assessment and better direct their performance towards those goals.

Especially in higher education, peer assessment commonly extends to evaluation of presentations, exhibits and portfolios, among other learning products. There is clearly great potential for the wider application of peer assessment in elementary and high schools, as another form of interactive learning with strong implications for student metacognition.

ORGANIZATIONAL DIMENSIONS OF PEER ASSISTED LEARNING

Each of these methods of PAL can vary on at least 13 organizational dimensions. These dimensions are explored next.

1. *Curriculum content*: knowledge or skills or combination to be covered. The scope of PAL is very wide and projects are reported in the literature in virtually every imaginable subject.

2. *Contact constellation*: some projects operate with one helper working with a group of peers, but the size of group can vary from 2 to 30 or more. Sometimes two or more helpers take a group together. PAL in pairs (dyads) is more intensive and there is less opportunity to drift into token participation in a pair.

3. *Within or between institutions*: while most PAL takes place within the same institution, it can also take place between different institutions, as when young people from a high school tutor in their neighborhood elementary (primary) school, or university students help in regular schools.

4. *Year of study*: helpers and helped may be from the same or different years of study.

5. *Ability*: while many projects operate on a cross-ability basis (even if they are same-year), there is increasing interest in same-ability PAL. In this the helper might have superior mastery of only a very small portion of the curriculum, or all might be of equal ability but working towards a shared, deeper, and hopefully correct understanding. Certainly, clear operational structures are necessary to avoid the “pooling of ignorance.” Indeed, “meta-ignorance” can be a problem—when the helper doesn't know that they don't know the correct facts.

6. *Role continuity*: especially in same-ability projects, roles need not be permanent. Structured switching of roles at strategic moments (reciprocal PAL) can have the advantage of involving greater novelty and a wider boost to self-esteem, in that all participants get to be helpers.

7. *Time*: PAL might be scheduled in regular class contact time, outside of this, or in a combination of both, depending on the extent to which it is substitutional or supplementary for regular teaching.

8. *Place*: correspondingly, PAL can vary enormously in location of operation.

9. *Helper characteristics*: the traditional assumption was that helpers should be the “best students” (i.e., those most like the professional teachers). However, very large differentials in ability can prove understimulating for the helper, and other large differences can inhibit modeling. If helpers are those who are merely average (or even less), all partners should find some challenge in their joint activities. Although the gain of the helped might not be so great, the aggregate gain of both combined may be greater. Many projects have deployed those with learning and behavior difficulties as helpers, to the benefit of the helpers themselves.

10. *Characteristics of the helped*: projects may be for all or a targeted subgroup, for example, the especially able or gifted, those with disabilities, those considered at risk of underachievement, failure or dropout, or those from ethnic linguistic, religious and other minorities.

11. *Objectives*: projects may target intellectual (cognitive) gains, formal academic achievement, affective and attitudinal gains, social and emotional gains, self-image and self-concept gains, or any combination. Organizational objectives might include reducing dropout, increasing access, and so forth.

12. *Voluntary or compulsory*: some projects require participation, while in others helpers self-select. This can have marked effects on the quality of what ensues.

13. *Reinforcement*: some projects involve extrinsic reinforcement for the helpers (and sometimes also the helped), while others rely on intrinsic motivation. Beyond simple social praise, extrinsic reward can take the form of certification, course credit, or more tangible reinforcement such as money. Extrinsic reward is much more common in North America than elsewhere, and this has led to some debate about possible excess in this regard. Reassuringly, the research evidence suggests that providing extrinsic reinforcement does not damage intrinsic reinforcement. However, its availability can have effects on recruitment in voluntary projects, which might be good or bad.

ORGANIZING PEER ASSISTED LEARNING

Insuring that PAL succeeds and takes root in an organization or community setting demands careful attention to the needs of learners, caregivers, and the system itself. Consultants can play a critical role in supporting consultees as they evaluate intervention options, considering the benefits and limitations to planned change. The following have been identified as essential elements to the success of PAL interventions (Topping & Ehly, 1998).

Cost–Benefit Balance for All

The benefits of any tactic or strategy must outweigh the costs for all concerned if an initiative is to endure. Costs might be measured in terms of time devoted, materials and other resources, and the stress involved in doing anything new. All of these should be kept as low as possible. Consultants are in a strong position to provide teachers with evidence of the merits

and limits of strategies, encouragement and reassurance, and guidance on the means to assess impact in relation to the priorities for change.

Strategies that appeal to the consultee and other stakeholders, that have a satisfying social and emotional tone, might benefit from a little deliberate cultivation. Of course, an initiative also needs to be compatible with current local priorities, the preferences of the professional peer group and area administrators. Fortunately, peer assisted learning has largely escaped adverse publicity—it is widely accepted and applied in schools across the globe.

A similar analysis can be applied to the students involved in the PAL process. They need to feel good about what they are doing, need to be clear what they and their partners are gaining through involvement, and need to be able to assert their support for what they are doing “in the face of incredulity from their peer group” (Topping & Ehly, 1998, p. 324).

Objectives and Applications

Objectives will vary across the different types of peer assisted learning. Objectives for a specific project might be in the cognitive, affective, or social domain, or some combination. A teacher could use a blend of cross age and same age, cross ability and same ability, fixed role and reciprocal role methods. The choice of format will relate to local objectives and preferences. The format can be selected to suit the subjects, topics, activities, classes, rooms, and so on that are important to the teacher.

Flexibility is essential. Strategies and tactics can be built to fit into local exigencies: complex organizations, highly structured timetables, lack of physical space, lack of appropriate furniture, poor acoustics, rigid attitudes in adults in positions of power, rigid attitudes in children who have learned to prefer passive inertia, and so on.

Materials, Preparation, and Monitoring

Although careful planning and preparation should proceed implementation of a PAL intervention, the day-to-day activities need not be elaborate or expensive. Materials already in the classroom or available through the media center are often quite adequate.

As noted earlier, training participants for the work that they will be doing is critical. The consultant and teacher should ensure training includes demonstration, practice, and coaching in the chosen method. This should

involve modeling as well as much discussion, questioning, and explaining. Ensure there are clear procedures for the identification, diagnosis, and correction of errors.

Close monitoring of participants is always needed, especially in the early stages of implementation. Consistent with the PAL orientation, students can be trained to act as monitors, not only of their own actions but those of their peers.

Evaluation, Iteration, and Rejuvenation

Consultants can function as an important resource in the assessment of goal attainment for PAL projects. In addition to formative feedback on the success of implementation plans (Are we on track?) and instructional strategies (Are the students learning?), evaluating summative outcome gains for all participants (e.g., tutors and their partners) is important, especially for first or pilot projects. Topping and Ehly (1998) encouraged evaluation of longer term as well as short-term gains, and consideration of the question whether cooperative helping generalizes outside PAL sessions. They also endorsed practices that encourage self-management (including self-monitoring), which can heighten self-esteem and responsibility and help to make initiatives self-sustaining.

As the PAL initiative proceeds through the academic year, most activities will benefit from rejuvenation—changes that allow variation or novelty to be introduced into the routine. Fortunately, PAL is very flexible and provides frequent opportunity to consider the possibility of a change of partners, subject topics or activities, format of operation, and so on. Programs embedded into the daily life of students (e.g., class-wide tutoring) can become part of the standard operating procedures of the school, but still benefit from an occasional refreshing adjustment in routine.

As PAL strategies are introduced and evaluated, the consultant can work with staff to build iterative cycles of involvement. For example, Topping and Ehly (1998) proposed cycles in different kinds of PAL in different formats, with children in differing roles (tutor, tutee) that vary across time, in a developmental progressive sequence. A very positive ethos often develops in schools in which PAL is accepted as a normal feature of everyday life, a strategy for learning and growing among peers. Given the frequency with which children interact with their peers, PAL interventions take advantage of where students want to be—close to their friends and classmates.

The dimensions along which PAL projects can differ have important implications for organization, but they tell us little about the processes through which PAL strategies operate and create their effects. To build a model of such processes, the theoretical underpinnings of PAL need to be explored. Such a model should have application across all PAL methods and all organizational dimensions.

HOW PAL WORKS: A CONCEPTUAL FRAMEWORK

The research literature concerning the theoretical underpinnings of PAL (reviewed in Topping & Ehly, 1998) may be summarized for the busy practitioner in a single chart (see Figure 1) which assigns some of the main subprocesses into one of five categories.

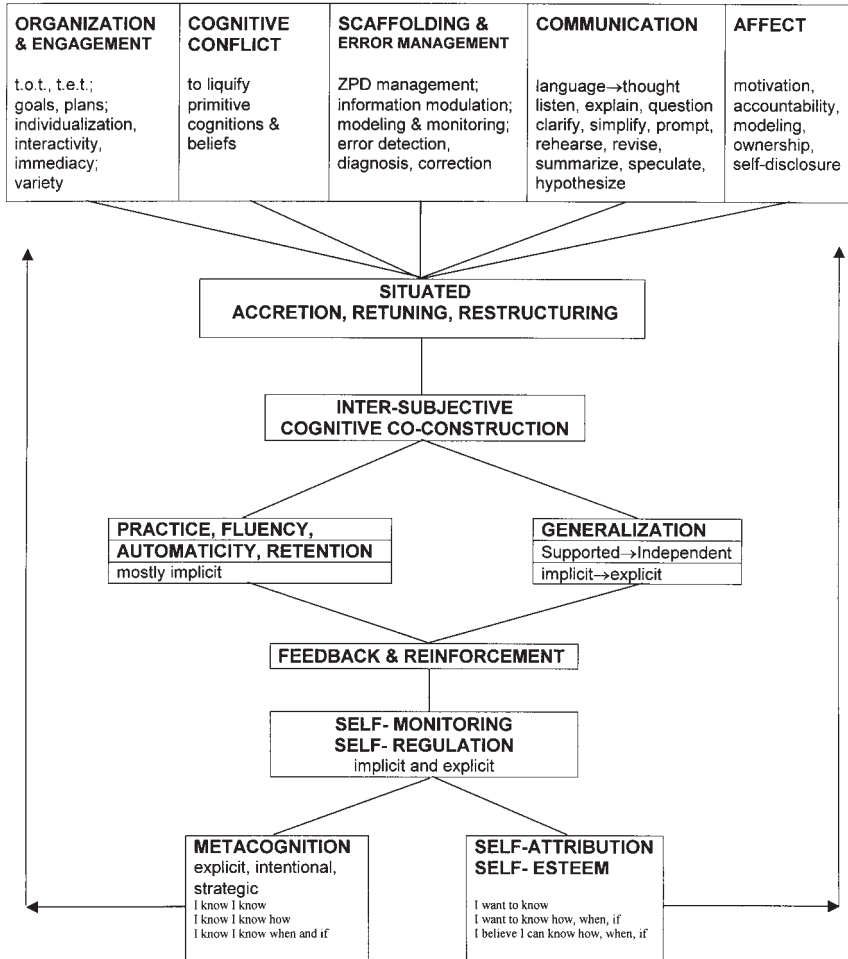
The first of these includes organizational or structural features of the learning interaction, such as the need and press inherent in PAL toward increased time on task (t.o.t.) and time engaged with task (t.e.t.), the need for both helper and helped to elaborate goals and plans, the individualization of learning and immediacy of feedback possible within the small group or one-on-one situation, and the sheer excitement and variety of a different kind of learning interaction.

Cognitively, PAL involves conflict and challenge (reflecting Piagetian schools of thought, and necessary to loosen blockages formed from old myths and false beliefs). It also involves support and scaffolding from a more competent other, necessitating management of activities to be within the zone of proximal development of both parties (reflecting Vygotskian schools of thought, and necessary to balance any damaging excess of challenge; Vygotsky, 1978).

The helper seeks to manage and modulate the information processing demands on the learner to maximize the rate of progress—neither too much nor too little. The helper provides a cognitive model of competent performance. The cognitive demands on the helper in terms of monitoring learner performance and detecting, diagnosing, correcting, and otherwise managing misconceptions and errors are great—and herein lies much of the cognitive exercise and benefit for the helper.

PAL also makes heavy demands on the communication skills of both helper and helped, and in so doing develops those skills. For all participants, they might never have truly grasped a concept until they had to explain it to another, embodying and crystallizing thought into language—another Vygotskian idea, of course. Listening, explaining, questioning, summariz-

Groups of Processes Influencing Effectiveness:



In iterative cycles: Surface → Strategic → Deep Declarative → Procedural → Conditional

FIGURE 1 Theoretical underpinnings of Peer Assisted Learning.

ing, speculating and hypothesizing are all valuable skills that should be transferable.

The affective component of PAL might also prove very powerful. A trusting relationship with a peer who holds no position of authority might facilitate self-disclosure of ignorance and misconception, enabling subsequent diagnosis and correction. Modeling of enthusiasm and competence and the simple possibility of success by the helper can influence the self-confidence of the helped, whereas a sense of loyalty and accountability to each other might help to keep the pair motivated and on-task.

These five categories or subprocesses feed into a larger onward process of extending each other's declarative knowledge, procedural skill and conditional and selective application of knowledge and skills by adding to and extending current capabilities (accretion), modifying current capabilities (retuning), and (in areas of completely new learning or cases of gross misconception or error) rebuilding new understanding (restructuring). These are somewhat similar to Piagetian concepts of assimilation and accommodation. This leads to the joint construction of a shared understanding between helper and helped—which is adapted to the idiosyncrasies in their perceptions (i.e., is intersubjective) and might not represent absolute truth, and is firmly situated within the current authentic context of application, but forms a foundation for further progress.

Subsequently, PAL enables and facilitates a greater volume of engaged and successful practice, leading to consolidation, fluency, and automaticity of core skills. Much of this might occur implicitly, that is, without the helper or helped being fully aware of what is happening with them. Simultaneously or subsequently, PAL can lead to generalization from the specific situated example through which a concept is learned, extending the ability to apply that concept and its developmental variants to an ever widening range of alternative and varied contexts—multiple communities of practice.

As this occurs, both helper and helped give feedback to each other, implicitly or explicitly. Indeed, implicit feedback is likely to have already occurred spontaneously in the earlier stages. PAL increases the quantity and immediacy of feedback to the learner very substantially.

Explicit reinforcement might stem from within the partnership or beyond it, by way of verbal or nonverbal praise, social acknowledgement and status, official accreditation, or even more tangible reward. However, reinforcement that is indiscriminate or predominantly for effort risks overweighting the nodal significance of the reinforced concept in the network of understandings of the learner.

As the learning relationship develops, both helper and helped should begin to become more consciously aware of what is happening to them in

their learning interaction, and more able to monitor and regulate the effectiveness of their own learning strategies in different contexts.

This development into fully conscious explicit and strategic metacognition not only promotes more effective onward learning, it should make helper and helped more confident that they can achieve even more, and that their success is the result of their own efforts. These affective and cognitive outcomes feed back into the originating five subprocesses—a continuous iterative process and a virtuous circle. As the PAL relationship develops, the model should continue to apply as the learning moves from the surface level to the strategic and on to the deep level, and from the declarative into the procedural and conditional.

APPLYING THE CONCEPTUAL FRAMEWORK

The integrated multiple channel process model of peer assisted learning outlined in Figure 1 applies to both helper and helped in different PAL methods in different organizational formats.

Simplistic forms of peer tutoring, focusing on drill and practice, seem likely to utilize only a few of the possible channels or subprocesses (typically only organization, perhaps some communication, scaffolding and error management, practice, and reinforcement—less than half of the total possibilities). More elaborate and cognitively demanding forms of peer tutoring, such as peer tutoring in thinking skills (e.g., Topping, 2001b), aim to utilize all the channels, with both tutor and tutee operating and benefiting in every channel. This might be enhanced and assured by role reciprocity. The greater the differential in ability or experience between helper and helped, the less cognitive conflict and the more scaffolding might be expected. Too great a differential might result in minimal cognitive engagement (let alone conflict) for the helper, and unthinking but encapsulated acceptance (with no retuning or co-construction) by the helped. Of course, if the helper is older, more experienced, and therefore more credible, but actually has no greater correct knowledge or ability than the helped, then a mismatch and faulty learning might occur in a different way.

Peer assessment likewise has the potential to utilize many channels, especially where it involves peer assessment of complex learning products and the peer assessment feedback is qualitative and elaborated and subsequently discussed. By contrast, simple quantitative peer marking or grading of learning products without onward discussion utilizes many fewer

channels and seems likely to have lesser impact (although it is likely to be less demanding for the teacher to operate).

Cross-institution or cross-year peer assisted learning might be characterized by high engagement during the learning time, but also incurs a penalty in the organizational channel, because it is more difficult to arrange for helpers and helped to meet, and time is spent in movement. The frequency of PAL has implications for the practice channel, because sporadic and occasional use of a PAL method does not foster fluency and automaticity in the PAL process, let alone the target area of learning. On the other hand, overuse of PAL methods is likely to adversely impact variety in the organization channel and motivation in the affect channel, while poor implementation is likely to incur other organizational penalties leading to onward adverse effects in other channels.

Different individuals within the same learning partnership, and different partner relationships, are likely to follow somewhat different pathways to the same learning goals. If one characteristic of the helpers and helped is that they are developmentally young or slow learners themselves, then few of the channels will develop automatically, intersubjectivity is likely to be primitive, and more training and closer monitoring, coaching and management by the teacher will be necessary. Although all channels might be utilized to some extent by both members of a pair, their different learning styles might lead them to use some channels more than others in ways unique to themselves. This highlights the individualization that is inherent in PAL methods, but takes the notion much further than the mere individualization of learning tasks or surface learning behaviors.

For some learning partners, using some PAL methods in some organizational formats, some benefits are likely to arise spontaneously through some channels. The nature of the learning task and the constraints of the physical learning environment are relevant variables here, the former more readily manipulated than the latter. The teacher's managerial role is to ensure that some channels are open to all learners, and to maximize the number of channels that are open to all learners, in the expectation that this will maximize learning for all. Thus, for all pairs some active monitoring and management of the PAL interaction by the teacher will be necessary. The teacher is likely to need to engage in scaffolding, pedagogical engineering, and extension work for all to some extent.

Many teachers are not habitually very effective in supporting higher-order cognitive processes in collaborative learning—let alone in “triggering” metacognition (Berardi-Coletta, Dominowski, Buyer, & Rellinger, 1995;

Meloth & Deering, 1999). Teachers are likely to need to be particularly attentive to the channels in the lower and later parts of chart:

- The development of generalization, self-regulation, metacognition, and enhanced self-esteem and motivation.
- The progressions from implicit to explicit, from dependency on support to increasing independence.
- The shift from simple thinking to higher order and more abstract thinking, moving from the surface level to the strategic and on to the deep level, and from the declarative knowledge into the procedural and conditional.
- The completion of the loop, the joining of the circle, the acceleration of the dynamic spiral, for both helper and helped.

Spontaneous (untrained) tutoring behaviors can tend to be primitive (Person & Graesser, 1999), often characterized by questioning limited both in frequency and level of cognitive demand, coupled with infrequent correction of errors and the giving of positive feedback when not appropriate. In addition to the implications for monitoring and managing and developing peer assisted learning while it is happening, the model also has implications for the content of training for the learners, be they helpers or helped.

The model can also be used profitably as a template (or two-dimensional observational checklist) for monitoring PAL interactions as they are happening—a tool to structure monitoring and diagnostic fault-finding. It can also provide a framework for helping the learning partners themselves to reflect on their own process—a tool for self-assessment that might further enhance metacognition.

CREATING THE FUTURE

The authors encourage readers to read further in this area. More detail of the research background can be found in Topping and Ehly (1998), and more practical guidance on planning, operating and evaluating PAL in Topping (2001a, 2001c). Both sources give details of many relevant resource materials. Review these methods with colleagues, try out some of the strategies presented, and contribute to the expansion and improvement of practice and knowledge. Over time, the consultant practitioner will become increasingly able to successfully develop an increasing number of types of PAL methods, with bigger and more challenging target populations.

The research literature on education and the daily news media provide eloquent testimony to the very real challenges facing schools and the educational process. For good or not, students are active participants with adults and each other in responding to the academic, social, and emotional challenges of school and community life. PAL represents a collection of intervention strategies that view students as catalysts in their own growth and development, as well as contributors to the lives of their classmates. PAL regards students not as part of the problem, but as part of the solution.

To readers involved in educational research, the authors similarly encourage attention to PAL in its myriad forms. Interventions under the PAL rubric have long attracted research and evaluation efforts—it is a rewarding field for research activity. Research has certainly evolved sufficiently to encourage firm confidence in the merits of implementation, but many fascinating questions remain. Action research programs in which teachers actively collaborate with consultants to seek solutions to educational challenges will lead to a more sophisticated awareness of the conditions under which PAL works best.

PAL can benefit every learner in some way, and should be organized to benefit every helper in some way. This is as true of the relationship between teacher and consultant as it is of that between the student helper and student who is nominally helped.

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