INSTITUTE OF EDUCATION
UNIVERSITY OF LONDON

NSIN RESEARCH MATTERS

The National School Improvement Network's bulletin that shares ideas from research and encourages discussion and reflection

No. 24 Autumn 2004

Classrooms as learning communities

The purpose of this paper is to review evidence on the effects of operating classrooms as learning communities. It is based on a reading of about 100 texts, not all of which are cited for reasons of space. Operating classrooms as learning communities may not be the dominant style, and may be correspondingly under-researched, but there is good evidence that it brings significant benefits – in short, better learning, better performance and better behaviour.

What helps learning in classrooms?

Multiple studies of classroom learning are analysed together from time to time. One such analysis, covering 11,000 statistically significant findings[1] showed that the way in which the classroom is managed is more influential than any other variable. So the teachers' role in composing a classroom is crucial. More recently an analysis which combined studies on over a million learners[2] arrived at two conclusions: 'Metacognition is the engine of learning', so that thinking and reflection are key processes for the classroom, and 'the self-system appears to be the control center for human behavior' so that how the classroom engages learners' beliefs and learners' control is crucial. Classrooms as learning communities aim to embrace both these conclusions.

Classrooms operate in different ways, reflecting the view of learning which is in operation[3]. The dominant approach has operated since the earliest known classrooms of c3000BC and is still promulgated by many voices, including those of government. It is 'Learning = being taught', with its associated language of transmission and delivery. In a smaller number of classrooms the view 'Learning = individual sense-making' operates. This accords with the findings of twentieth century research on human understanding. In the fields of mathematics and science education, much research adopts this constructivist view of learning (despite the fact that the folk view of these subjects holds strongly that they are about facts and knowledge rather than sense-making)[4]. Constructivist classrooms get better results than those run along the lines of 'learning = being taught'[5].

So what is a learning community?

A learning community is a collective which learns together, including about its collective process of learning. Thus the adjective "learning" is used in a strong sense: learning community is not merely a synonym for school. The focus is on human processes for building social and learning relations. This contrasts with loose uses of the term community to mean the geographical surroundings of the school. The term "community of learners" is used to describe a collective of learners whose process of learning is mainly viewed in individual terms. Although they may act collaboratively at times they do not learn about collaboration.

A community is a collective with certain hallmarks:
- Agency: members decide, review
- Belongingness develops
- Cohesion amongst members emerges
- Diversity is embraced rather than a difficulty

Particular processes are likely to be present:
- Active engagement with the community goal
- Bridge-building to other communities
- Collaboration to create joint products
- Dialogue to engage and progress

A community of learners is all of the above, with an additional focus on learning, usually through enquiry and the creation of new knowledge.

A learning community also learns about itself, so reflection (of a collective sort) and learning about learning (again collectively) are present.

The research to be considered here goes beyond the idea of 'learning = individual sense-making', toward the view that learning is constructing knowledge with others. 'In a learning community the goal is to advance the collective knowledge and, in that way, support the growth of individual knowledge[6]. It positions learning in a process of dialogue and negotiation among the members of the

community, and the culture they create[7]. Here, social relations and knowledge-creation meet. Knowledge (both individual and shared) is seen to be the product of social processes.

There are fewer studies than one might reasonably expect of classrooms which develop in this style. Much classroom research reflects the dominant conception of 'learning = being taught'.

The School as a Context for Classrooms

Classrooms have more influence on learner outcomes than schools, but they rarely operate as separate islands, and one of the major influences on them is the culture of the school. Research on schools as communities provides a backdrop for the focus on classrooms.

Some schools operate more as communities than do others. This difference makes a difference to a range of behaviours and capacities as learners. Secondary schools that score high on an index of communal organization 'attend to the needs of students for affiliation and … provide a rich spectrum of adult roles [that] can have positive effects on the ways both students and teachers view their work. Adults engage students personally and challenge them to engage in the life of the school'. Such schools show

higher teacher efficacy, morale and enjoyment, and students in such schools are more interested in academics, absent less often, and there are less behaviour difficulties[8]. A study of 11,794 16 year-olds in 830 secondary schools revealed that students' gains in achievement and engagement were significantly higher in schools with practices derived from thinking of the school as a community, rather than the common form of thinking of the school as a bureaucracy[9]. Similar findings apply to primary schools: those where students agree with statements such as 'My school is like a family' and 'Students really care about each other' show 'a host of positive outcomes. These include higher educational expectations and academic performance, stronger motivation to learn, greater liking for school, less absenteeism, greater social competence, fewer conduct problems, reduced drug use and delinquency, and greater commitment to democratic values'[10].

Pupils' sense of the school as a community connects with individual matters such as motivation. A study of 301 students in the early secondary years concluded 'a student's subjective sense of belonging appears to have a significant impact on several measures of motivation and on engaged and persistent effort in difficult academic work'. These motivation-related measures are more associated with the sense of belonging to school than they were with their friends' valuing of school, thereby challenging the folk theory of 'peer pressure' as most influential in motivation[11]. Sense of school belonging is positively related to academic grades, even more so when students feel that school focuses on learning and on improving competence rather than on performance and proving competence[12]. Students with higher sense of school membership report higher grades, and a more internal locus of control, the sense that success was more in their hands than in the hands of others[13]. This last element can be seen as evidence against interpreting sense of school membership as a simple idea of compliance to organisational rules - the characteristics of the school matter. Similarly, sense of belonging to school is not confining students to their school: it is associated with looking ahead and expectations for the future[14]. A high level of affiliation to school reflects students' current participation in school, not their history of prior achievement[15]: it is influenced by both peers and teachers, more so than by parents[16], and weakly influenced by typical aspects of school leadership and organization[17].

Students' sense of school membership influences their patterns of behaviour outside school as well as inside. Schools with higher average sense-of-community scores had significantly lower average student drug use and delinquency, suggesting that schools that are experienced as communities may enhance students' resiliency[18]. School supportiveness, sense of community, and opportunities for students to interact and to exert influence are key factors. A survey of 36,254 13 to 18 year-old students showed that school connectedness (more so than family connectedness) was the most salient protective factor against behaviours such as drug use, school absenteeism, pregnancy risk, and delinquency risk. Analysis of 12,118 follow-up interviews concluded 'We find consistent evidence that perceived caring and connectedness to others is important in understanding the health of young people today"[19].

School differences are also set in a larger picture across countries, indicating that schools operate more as communities in some countries than in others. In a recent survey of representative samples in 42 countries, 224,058 15-year-olds in 8,364 schools were asked to respond to 'My school is a place where I feel like I belong'. 79% affirmed this statement, but country differences ranged from France (44%) Spain (52%) and Belgium (53%) to Australia (85%) Finland (86%) and Hungary (89%)[20]. Within countries, school differences were significant: 'In nearly every country, there is a wide range among schools in the prevalence of students considered to have a low sense of belonging and low participation'. This variation is not explained by 'family background' of students but suggests aspects of school policy and practice create student disaffection.

Sense of school community can be enhanced for both students and teachers, and the route is through the classroom rather than through extra-curricular programmes or activities[21]. This approach is especially relevant for those schools which are sometimes portrayed as most difficult: 'the potential benefits of enhancing school community may be greatest in schools with large numbers of economically disadvantaged students'[22]. The benefits are often lasting, from primary schools persisting through secondary school[23] on achievement test scores, academic engagement, social skills, and misbehavior.

The Classroom

This section reviews effects of classrooms as communities, as communities of learners, and as learning communities. The messages of the three sub-sections are cumulative. Classroom practices are briefly indicated in a later section.

A. Classrooms as Communities

1. Students are crew, not passengers

In any collective which operates as a community, all participants are active. The collaboration on which classrooms as communities depend requires that students are active agents in choosing and learning:

> 'We propose that the engine of collaboration is agency and its expression in the effort to represent and share in other people's thoughts. … productive agency appears in the very way we learn -- we construct knowledge'[24].

The creation of higher levels of agency for children is the challenge of creating classrooms that are knowledge-building environments.

An emphasis on community action is not in tension with emphasising achievements of individuals, as sometimes portrayed. An eminent researcher in this field concludes:

> 'The findings taken as a whole show that the higher the perceived collective efficacy, the higher the groups' motivational investment in their undertakings, the stronger their staying power in the face of impediments and setbacks, and the greater their performance accomplishments'[25].

2. Pupils act as part of a larger whole

As students' sense of community increases, participation increases. By encouraging supportive relationships among students through cooperative learning activities, student satisfaction with the group increases and behavioural referrals drop by as much as 71%[26]. Students show greater capacity to build relationships, and less worry about 'being put down'. In informal activities, good relations become more widespread and factions decrease.

As relatedness increases, so does motivation. In a longitudinal study of 4515 students aged 9 to 12, both intrinsic academic motivation and autonomy were related to students' sense of community[27]. This was explained in terms of core motivations: 'The higher the perceived quality of relatedness, the greater one's feelings of autonomy and competence". So relatedness and autonomy are not opposites, as they are sometimes depicted. Children's performance as measured by grades, achievement, and teacher ratings of competence also increased, as (in other studies) did students' sense of efficacy.

As students feel more supported they become more engaged and this in turn reduces risk behavior and likelihood of dropping out. In a longitudinal study of 443 urban African American adolescents, engaged students reported more positive perceptions of relatedness in the school setting than did students who were less engaged[28].

3. "We" rather than "you and me"

Classrooms which operate as communities encourage children to take an active role in classroom governance. The authority structure of the classroom is an important determinant of students' experience of community and of some of its observed effects. The style of governance makes a difference: when teachers define positive student behaviour as *interpersonal helpfulness, concern and understanding , students' interpersonal behaviour is more helpful than when diligence, compliance and respect for authority* are emphasised[29].

When pupils work collaboratively with the teacher to develop solutions to discipline problems, and. teachers avoid extrinsic incentives (rewards as well as punishments) there are better outcomes on "measures of prosocial values, helping, conflict resolution skill, responses to transgressions, motivation to help others learn, and intrinsic motivation'[30]. There is also more of the higher level moral reasoning based on internalized values and norms, and less reasoning based on conformity to authority, social approval or disapproval, or reward and punishment.

Teachers' encouragement of cooperative activities appears to be particularly important in teacher practices associated with students' sense of the classroom as a community[31].

4. Diverse contributions are embraced.

When classrooms operate as communities, a wider range of roles becomes available, both for the classroom and for each participant. Patterns of contribution become more balanced than those in teacher-centred classrooms, with individuals whose contribution rates are markedly different in large group settings displaying very similar contribution rates in small groups. '[small group] provided a more equitable opportunity for its members to participate in high-level discourse about science than did whole-class lessons'[32]. In such conditions, possession of ideas and right answers is less important. Students emphasize that they should work as a community and that 'it is the idea that matters, not who came up with it in the first place'[33].

Pupils learn a wider range of roles. Working as a community brings out helpfulness and facilitation of learning[34]. A wider range of pupils becomes valued. Classroom communities de-emphasise difference and promote inclusion, with practices which promote membership and belonging for all, including classmates with severe disabilities.

Sense of a classroom as a community can be enhanced over time, with one study showing improvement for each of three years.

B. Classrooms as Communities of Learners

Running a classroom as a community does not necessarily affect the conception of learning in operation: a teacher-centred view could continue. This sub-section reviews studies of the community embracing the fact that the members are learners.

1. Engaged enquiry emerges

Agency and belonging in a community of learners are enhanced by the key practice of eliciting learners' questions. When created before reading, such questions are of a higher order than those produced after reading. Intellectual demandingness is high in the type of questions and the processes which follow. Students ask questions derived from their need to understand and focus on things of genuine interest. They follow those questions in depth, even in primary school.

When students direct collaborative knowledge-building discussions, they pursue the issues of the subject. In science topics they collectively exhibit a high level of scientific thinking, validated by independent scientific judges. In a maths classroom: 'students expressed their real interest and were motivated to work on problems. They engaged in mathematical discussions rather than applying algorithms and textbook rules'[35].

In other examples students became passionately engaged, used evidence in scholarly ways, developed several arguments, and generated core questions. 'Students' arguments for their claims became increasingly sophisticated over time'[36].

2. Students help each other learn

When interaction between members of a class is focused on the topic and process of learning, their relations become more respectful and helpful. 'Children, collaborating as members of a community of inquiry, are motivated to help each other and to learn from each other'[37].

As pupils get to know each other as learners, trust builds and so do contribution and collaboration: members become more likely to 'ask questions, express a minority opinion, play the devil's advocate, or publicly wrestle with ideas'[38]. Concerns about peer judgment and fear of criticism decrease.

Appropriate ICT can make an important contribution. If its design supports collaboration through the construction and pursuit of collaborative learning goals, students engage in more reflective activity than when only face-to-face[39].

3. Productive engagement and orientation to learn

Increased student agency creates a range of effects: group productivity increases as students gain ownership, cognitive engagement increases as public dialogue centres on discussions of their own experiences, and students take responsibility for learning and teaching as they work in teams. Under these conditions, collaboration creates more abstract thinking than does individual work[40]. When tasks are student-initiated collaborative interactions in groups increase; by contrast when students complete teacher-designed activities student dialogue centres more on the procedural aspects of the activity[41].

Pupils' learning orientation increases, and this is crucial for them to be active engaged learners and for high achievement. At transition between schools learners can change towards a performance orientation – the concern for proving competence rather than improving competence. A longitudinal survey of 660 students indicated that exceptions to this pattern occur when learners perceive a learning orientation in classrooms, and these occasions are associated with higher sense of school belonging[42].

4. Better knowledge, understanding, application and transfer.

Fostering a community of learners encourages pupils to (i) engage in self-reflective learning, and (ii) act as researchers who are responsible to some extent for defining their own knowledge and expertise. By advancing each others' understanding in small groups, through processes such as 'reciprocal teaching'[43], the aim is to enhance children's emergent strategies and metacognition.

Results from such classrooms show both literacy skills and subject knowledge improving, specifically:

- 'domain-specific content is retained better';
- 'students were able to use information more flexibly in discussing thought experiments' (hypothetical situations) and counter-examples;
- students were better at applying knowledge, and introduced more novel variations of taught principles;
- students show better transfer of learning to other domains: (1) reading comprehension improved on materials outside the domain of study, and (2) increasingly complex forms of argumentation and explanation strategies were acquired;
- students more than doubled their comprehension on a measure where they answered questions after reading a provided passage unrelated to the curriculum of the class;
- students' argumentation improved: 'Explanations were more often supported by warrants and backings. … plausible reasoning strategies began to emerge'[44].

This approach goes well beyond attempts to train pupils in learning strategies, when typically there is little evidence of them using strategies when left to their own devices. Such failure shows children's lack of insight into their ability to learn intentionally; they lack reflection[45]. In communities of learners 'students should be active participants in the program, aware of their learning processes and progress. They should come to understand why they are engaging in the activities that form the basis of the program. …they should be able to serve as collaborators in the orchestration of their own learning'[46].

C. Classrooms as Learning Communities

A classroom run as a learning community operates on the understanding that the growth of knowledge involves individual and social processes. It aims to enhance individual learning that is both a contribution to their own learning and the group's learning, and does this through supporting individual contributions to a communal effort. Here the stance is that the agent of inquiry is not an individual, but a knowledge-building community.

1. Discourse of the discipline develops.

Accounts of classrooms as knowledge-building communities include those with specially designed ICT support. From the earliest examples 'There have been impressive results in textual and graphical literacy, theory improvement, students' implicit theories of learning, standardized achievement tests, and comprehension of difficult texts. Results appear stronger the longer students use this collaborative environment'[47]. Disciplined discourse emerges: records of a community discussion over a period three months, comprising 179 entries[48] show that although it may begin as personally-oriented, it evolves into a scientific inquiry. Students pursue various knowledge sources, and undertake empirical studies so as to test their questions.

2. We share what is known and what needs to be known

In this sort of classroom, members not only take responsibility for themselves and others, but also take responsibility for knowing what needs to be known and for insuring that others know what needs to be known.

The cognitive and the social are both developed in such an environment. 14 year-olds whose class ran as a constructivist learning environment using communal knowledge-building software over a one-year period showed 'a higher level of self-regard, improved ability to regulate their behavior and an increased ability to make credible judgments about someone else's assertions than did the control group'[49].

3. Conceptions of learning are richer

Classrooms which operate as knowledge-building communities are characterized by the interplay of private and public reflection, and in such contexts students change their approach to learning from a shallow passive one to a deeper active one. 110 junior school students in five comparable classes were assessed in terms of their beliefs about learning, and their reading comprehension, six months apart. They became more likely to report that learning is a matter of understanding and not simply getting all of the facts, that it is important to fit new information with what is already known and that learning is a matter of understanding increasingly complex information and not simply a matter of answering all of the questions. These students showed a significant improvement in problem solving and recall of complex information, and were significantly more likely to use information provided in a text to solve problems.

The shared view of knowledge which develops in a learning community is voiced by 11 year-olds reflecting on their learning:

> 'Even if you learn something perfectly, or are a pioneer in your area, all your work is useless if nobody else can understand you. You might as well have done no work at all. The point of learning is to share it with others. Lone learning is not enough.'

> 'Good science making is all about working with ideas, testing them out in different conditions, retesting, talking with people who are working on similar ideas, and bringing ideas to the whole group.'[50]

4. We understand our learning together.

The combination of talking and writing is important in the service of learning: by discussing their understandings students construct more advanced knowledge, and incorporate the outcomes of discussions in their written understandings. 11 year-olds have been very positive about talking- and writing-to-learn and also on the combination, which shows an appreciable level of meta-cognitive awareness[51]. Collective metacognition has been noted emerging in group discussions amongst 14 year-olds. This includes planning and regulating (including standards for task performance), monitoring (including comments on the status of their understanding), and evaluating (including evaluating others' ideas - positively more often than negatively)[52]. In these ways one hallmark of a learning community is built – it is a community which learns about its own learning.

Again, interventions which focus on running classrooms as learning communities have proved viable, with important results, not the least of which is changing the culture of the classroom[53].

The processes of a learning community can be built without expensive technological support[54], Indeed, relying on pre-existing technology from outside is not likely to change the dominant culture of classrooms. Technology needs to co-evolve with social practices and structures of participation in communities for effective learning environments to be built.

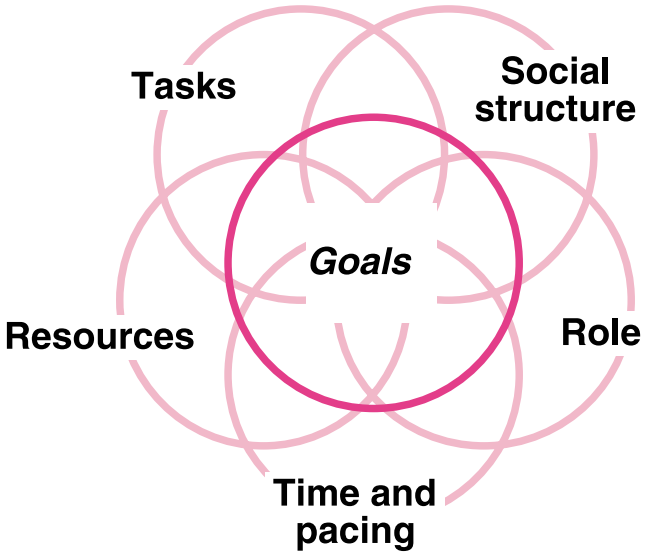
Pause for Thought.

As we reach the end of the three sub-sections reviewing classrooms, are the messages cumulating in any way? From paying attention to the social aspects of classrooms, to the learning aspects for individuals and for groups?

What classroom practices does the research here help you to consider?

Classroom practices

Classrooms are complex places: they operate in different ways with different patterns of activities. These activity systems can be described with the following interacting elements



When a classroom operates as a learning community, the elements are likely to be as described below (further detail elsewhere[55]).

Goals

At their worst, classroom goals have become narrowed to doing well in performance tests. This downgrades intrinsic goals in learning. Putting the official voice on the wall and calling it a learning objective can lead to disengagement and strategic action by learners. Something may be reclaimed by asking learners to discuss:

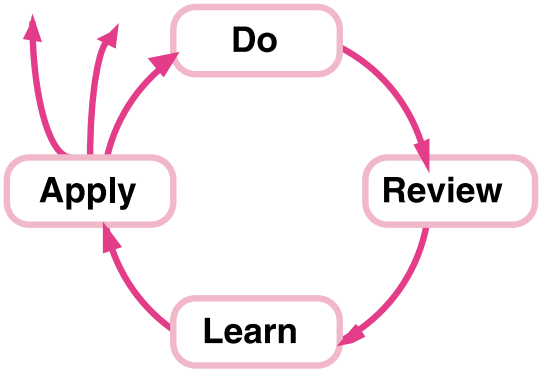
What could this mean?
Do we know anyone who uses this?
What could we do better if we achieved this? and
How could we best learn this?

In learning communities, the intrinsic value of learning is emphasised. Learners' questions about a topic drive the agenda, and learner agency is increased through their exercising of choice and their planning how best to go about the learning.

At the most fully-developed, a classroom can operate toward community goals, for example: "In this classroom: Our goal is to improve knowledge together – of this topic and of how best to learn" or "Our goal is to learn together as best we can".

Tasks

Many classroom tasks reduce learning to short-term procedures, in which some tangible (i.e. simply assessable) product emerges, but the process of learning is not addressed. In order to learn from what we do, all the elements in the cycle below need time and attention.



In a learning community, tasks which promote engagement and community learning are likely to be:

- compositional – the details emerge as the task is addressed
- consequential – learners feel that they can do something different as a result
- reflective – including pauses to notice the process
- communicative – for example explaining to oneself and to others
- collaborative – creating a single product from multiple efforts
- community – engaging the whole class contributions, including the community reflections

Social Structure

A learning community uses practices for creating interdependence in the classroom. These often start from regular varied pair work, develop into peers teaching each other, extend to small groups creating knowledge resources for each other, and include whole-class reviews which may be recorded in some communal form. Throughout these structures there are occasions to review both the structure and the process: for example, what sort of talk helps learning, when is small group work most effective, how can groups best exchange their learning, and so on.

Resources

A learning community utilises resources of material and human sorts, both inside and beyond its boundaries, and needs communications resources to do so. The teacher becomes a key mobiliser of these resources. In classrooms learners need to have appropriate access to resources and also feel empowered to access them: they also flourish when the capacity to act as a resource for each other's learning has been developed.

Roles

In learning communities roles are more widely distributed than in the typical classroom because responsibilities are more widely distributed. Community decisions are made together, the class as a community has a physical presence in the classroom, The teacher's role changes: they spend less time on organising the classroom, they do less telling, they do more designing of activities, they do more to get students learning from and with each other, and they demonstrate how a skilled learner (the teacher) continues to learn. Pupils' roles change as they take on more responsibility. They learn new roles and learn about roles through reviewing what has emerged.

Observing classrooms

To view a classroom as a learning community is a change in our way of seeing, from the dominant stance to something new. This takes practice. In the current context there seems to be more observation of classrooms: if this is professionally handled it is to be welcomed. But such observation often unwittingly adopts the dominant teacher-centred view. Below are three versions of frameworks for observing classrooms, derived from current practice and the three views of learning.

Version 1: "Learning = being taught"[56]

Teachers show good command of subjects
Teachers plan effectively
Teachers have clear learning objectives
Teachers interest pupils
Teachers make effective use of time
Students acquire new knowledge or skills in their work
Students show positive response to teaching
Students show engagement and concentration, and are productive
Teachers assess pupils' work thoroughly and constructively
Teachers use assessment to inform their planning and target-setting
Students understand how well they are doing and how they can improve.

Version 2: "Learning = individual sense-making"[57]

Students are engaged in active participation, exploration and research
Students are engaged in activities to develop understanding and create personal meaning through reflection
Student work shows evidence of conceptual understanding, not just recall
Students apply knowledge in real world contexts
Students are presented with a challenging curriculum designed to develop depth of understanding
Teacher uses diverse experiences of students to build effective learning
Students are asked by the teacher to think about how they learn, explain how they solve problems, think about their difficulties in learning, think about how they could become better learners, try new ways of learning[58]
Assessment tasks are performances of understanding, based on higher order thinking

Version 3: "Learning = creating knowledge as part of doing things with others"

Students operate together to improve knowledge
Students help each other learn through dialogue
Learning goals emerge and develop during enquiry
Students create products for each other and for others
Students access resources outside the class community
Students review how best the community supports learning
Students show understanding of how group processes promote their learning
The classroom social structures promote interdependence
Students display communal responsibility including in the governance of the classroom
Assessment tasks are community products which demonstrate increased complexity and a rich web of ideas

The purpose of presenting these three versions of observation frameworks is to locate the dominant one, and to support practice in the other two.

Closing Reflections

This review offers adequate evidence to support the idea that the development of learning communities should be a key feature of 21st century schools. The connectedness of outcomes – social, moral, behavioural, intellectual and performance - is a particularly important feature.

Our education system continues to reward individual achievement , yet the evidence reviewed here indicates that a more collective stance achieves better outcomes.

A classroom is necessarily a collective, but it is seldom described or approached as that. Terms such as "form" or "class" show how a bureaucratic viewpoint dominates. This review suggests that there is much to be gained from treating a class as an active and productive collective.

The ideas here will perhaps create tensions for teachers in the current context, yet there are many examples where teachers surpass the tensions and create something better.

Review	What reflections about your own learning and teaching did your reading of this paper stimulate?
	How do your school practices support the development of a learning community?
Learn	In what way has your view of collective learning developed as a result of your reading?
	What new visions for classrooms and schools have these ideas stimulated?
Apply	How would you tell a story of these ideas with some of your colleagues?
	What experiments can you plan to undertake in developing a learning community?

Written by Chris Watkins.
Series editor: Frank McNeil, f.mcneil@ioe.ac.uk

[1]Wang M et al. (1990), 'What influences learning: a content analysis of review literature', Jnl of Educl Research, 84: 30-43
[2]Marzano RJ (1998), *A Theory-Based Meta-Analysis of Research on Instruction*, Aurora CO: McREL
[3]Watkins C (2003), *Learning: a sense-maker's guide*, London: Association of Teachers and Lecturers
[4]Driver R et al. (1994), 'Constructing scientific knowledge in the classroom', *Educl Researcher*, 23(7): 5–12
Cobb P & Bauersfeld H (eds.) (1995), *The Emergence of Mathematical Meaning*, Hillsdale NJ: Erlbaum
[5]Staub FC & Stern E (2002), 'The nature of teachers' pedagogical content beliefs matters for students' achievement gains', Jnl of Educl Psych, 94: 344-355
Inagaki K et al. (1998), 'Construction of mathematical knowledge through whole-class discussion', *Learning and Instruction*, 8: 503-526
Abbott ML & Fouts JT (2003), *Constructivist Teaching and Student Achievement*, Lynnwood WA: Seattle Pacific University, Washington School Research Center
[6]Scardamalia M & Bereiter C (1994), 'Computer support for knowledge-building communities', Jnl of the Learning Sciences, 3: 265-283
[7]Prawat RS & Peterson PL (1999), 'Social constructivist views of learning' in Murphy J & Louis KS (eds.), *Handbook of Research on Educational Administration 2nd edn*, San Francisco: Jossey-Bass
[8]Bryk AS & Driscoll ME (1988), *An Empirical Investigation of the School as a Community*, Chicago IL: University of Chicago School of Education
[9]Lee VE & Smith JB (1995), 'Effects of high-school restructuring and size on early gains in achievement and engagement', *Sociology of Ed*, 68: 241-270
[10]Lewis C et al. (1996), 'The caring classroom's academic edge', *Educl Leadership*, 54(1): 16-21
[11]Goodenow C & Grady KE (1993), 'The relationship of school belonging and friends values to academic motivation among urban adolescent students', Jnl of Experimental Ed, 62: 60-71
[12]Roeser R et al. (1996), 'Perceptions of the school psychological environment and early adolescents' psychological and behavioral functioning in school: The mediating role of goals and belonging', Jnl of Educl Psych, 88: 408-422
[13]Hagborg W (1998), 'An investigation of a brief measure of school membership', *Adolescence*, 33(130): 461-468
[14]Israelashvili M (1997), 'School adjustment, school membership and adolescents' future expectations', Jnl of Adolescence, 20: 525-535
[15]Voelkl K (1997), 'Identification with school', *American Jnl of Ed*, 105: 294-318.
[16]Connell JP & Wellborn JG (1991), 'Competence, autonomy, and relatedness: a motivational analysis of self-system processes' in Gunnar MR & Sroufe LA (eds.), *Self Processes and Development*, Hillsdale NJ: Erlbaum
[17]Leithwood K & Jantzi D (2000), 'The effects of transformational leadership on organizational conditions and student engagement with school', Jnl of Educl Administration, 38: 112-129
[18]Battistich V & Hom A (1997), 'The relationship between students' sense of their school as a community and their involve-ment in problem behaviors', *American Jnl of Public Health*, 87: 1997-2001
[19]Resnick MD et al. (1997), 'Protecting adolescents from harm: findings from the National Longitudinal Study on Adolescent Health', *Jnl of the American Medical Association*, 278(10): 823-832
[20]OECD (2001), *Knowledge and Skills for Life: first results from the OECD "Programme for International Student Assessment" (PISA)* 2000, Paris: OECD
Willms JD (2003), *Student Engagement at School: a Sense of Belonging and Participation. Results from PISA* 2000, Paris: OECD
[21]Osterman KF (2000), 'Students' need for belonging in the school community', *Review of Educl Research*, 70: 323-367
[22]Battistich V et al. (1997), 'Caring school communities', *Educl Psychologist*, 32: 137-151
[23]Schaps E (2003), 'Creating a school community', Educl Leadership 60(6): 31-33
[24]Schwartz DL and Lin X (2001), 'Computers, productive agency, and the effort toward shared meaning', Jnl of Computing in Higher Ed, 12(2): 3-33
[25]Bandura A (2000), 'Exercise of human agency through collective efficacy', *Current Directions in Psychol. Science*, 9(3): 75-78
[26]Johnson L et al. (1995), *Reducing negative behavior by establishing helping relationships and a community identity program*, Rockford Ill.:
[27]Battistich V et al. (1995), 'Schools as communities, poverty level of student populations, and students' attitudes, motives and performance: a multilevel analysis', *American Ed Research Jnl*, 32: 627-658
[28]Connell JP et al. (1995), 'Hanging in There: behavioral, psychological, and contextual factors affecting whether African-American adolescents stay in high-school', *Jnl of Adolescent Research*, 10: 41-63
[29]Benninga JS et al. (1991), 'Effects of two contrasting school task and incentive structures on children's social development', *Elementary School Jnl*, 92: 149-167
[30]Schaps E & Solomon D (1990), 'Schools and classrooms as caring communities', *Educl Leadership*, 48(3): 38-42
[31]Solomon D et al. (1997), 'Teacher practices associated with students' sense of the classroom as a community', *Social Psych of Ed*, 1: 235-267
[32]Rafal CT (1996), 'From co-construction to take-overs: science talk in a group of four girls', *Jnl of the Learning Sciences* 5: 279-293
[33]Elbers E (2003), 'Classroom interaction as reflection: learning and teaching mathematics in a community of inquiry', *Educl Studies in Mathematics*, 54: 77-99
[34]Christal M et al. (1997), *Schools as Knowledge-Building Communities*, Denton TX: Texas Center for Educl Technology
[35]Elbers E (2003), op cit. Note 33
[36]Engle RA & Conant FR (2002), 'Guiding principles for fostering productive disciplinary engagement: explaining an emergent argument in a community of learners classroom', *Cognition and Instruction*, 20: 399-484
[37]Elbers E & Streefland L (2000), 'Collaborative learning and the construction of common knowledge.' *European Jnl of Psych of Ed* ,15: 479-90
[38]Osterman KF (2000) op cit. Note 21
[39]Cohen A & Scardamalia M (1998), 'Discourse about ideas: monitoring and regulation in face-to-face and computer-mediated environments', *Interactive Learning Environments*, 6: 93-113
[40]Schwartz DL (1995), 'The emergence of abstract representations in dyad problem solving', *Jnl of the Learning Sciences*, 4: 321-354
[41]Crawford B et al. (1999), 'Elements of a community of learners in a middle school science classroom', *Science Ed*, 83: 701-23
[42]Anderman LH & Anderman EM (1999), 'Social predictors of changes in students' achievement goal orientations', *Contemporary Educl Psych*, 25: 21-37.
[43]Palincsar AS & Brown AL (1984), 'Reciprocal teaching of comprehension-fostering and monitoring activities', *Cognition and Instruction*, 1: 117-175
[44]Brown AL & Campione JC (1994), 'Guided discovery in a community of learners' in McGilly K (ed.) *Classroom Lessons*, Cambridge MA: MIT Press
[45]Brown AL (1997), 'Transforming schools into communities of thinking and learning about serious matters', *American Psychologist*, 52: 399-413
[46]Campione J et al. (1995), 'Forms of transfer in a community of learners: flexible learning and understanding' in McKeough A et al (eds.) *Teaching for Transfer*, Mahwah NJ: Erlbaum
[47]Scardamalia M & Bereiter C (1996), 'Student communities for the advancement of knowledge', *Communications of the ACM* 39(4): 36-37
[48]Bereiter C et al. (1997), 'Postmodernism, knowledge building, and elementary science', *Elementary School Jnl*, 97: 329-40
[49]Ryser G et al. (1995), 'Effects of a Computer-Supported Intentional Learning Environment on students' self-concept, self-regulatory behavior, and critical thinking ability', *Jnl of Educl Computing Research*, 13: 375-385
[50]Caswell B & Bielaczyc K (2002), 'Knowledge Forum: altering the relationship between students and scientific knowledge', *Education, Communication & Information*, 1: 281-305
[51]Mason L (1998), 'Sharing cognition to construct scientific knowledge in school context', *Instructional Science*, 26: 359–389
[52]Hogan K (2001), 'Collective metacognition: the interplay of individual, social and cultural meaning in small groups' reflective thinking' in Columbus F (Ed.), *Advances in Psychology* Research Vol. 7, Huntington NY: Nova Science
[53]Hakkarainen K (2003), 'Emergence of progressive-inquiry culture in computer-supported collaborative learning', *Learning Environments Research*, 6(2): 199-220
[54]Hume K (2000), 'Seeing shades of grey: developing a knowledge-building community through science' *in* Wells G (Ed.), *Action, Talk, and Text : Learning and Teaching through Inquiry*, New York: Teachers College Press
[55]Watkins C (2005) *Classrooms as Learning Communities*, London: Routledge
[56]Abbreviated from Ofsted (2003) *Framework for inspecting schools*, London: Ofsted.
[57]See Abbott &. Fouts, Note 5
[58]Thomas GP (2003) 'Conceptualisation, development and validation of an instrument for investigating the metacognitive orientation of science classroom learning environments', Learning Environments Research 6: 175-197