Learning Communities in Classrooms: Advancing Knowledge For a Lifetime

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Learning Communities in Classrooms: Advancing Knowledge For a Lifetime

By Katerine Bielaczyc and Allan Collins

The learning-communities approach fits with the growing emphasis on lifelong learning, which can naturally be extended beyond the classroom walls. There is every reason for a learning community to include parents and members of the wider society. With the addition of computer networks it becomes possible to include scientists and other professionals, as well as students around the globe, in communities that are trying to understand and deal with social and political ideas and issues.

In a learning community the goal is to advance the collective knowledge and, in that way, support the growth of individual knowledge (Scardamalia and Bereiter, 1994). The defining quality of a learning community is that there is a culture of learning, in which everyone is involved in a collective effort of understanding.

There are four characteristics that such a culture must have:

1. Diversity of expertise among its members, who are valued for their contributions and given support to develop
2. A shared objective of continually advancing the collective knowledge and skills
3. An emphasis on learning how to learn
4. Mechanisms for sharing what is learned.

If a learning community is presented with a problem, it can bring its collective knowledge to bear on the problem. It is not necessary that each member assimilate everything that the community knows, but each should know who within the community has relevant expertise to address any prob-

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lem. This marks a departure from the traditional view of schooling, with its emphasis on individual knowledge and performance, and the expectation that students will acquire the same body of knowledge at the same time.

As the world becomes more complex, students find themselves unprepared for its challenges, both personal and social. The new demands that society is placing on young people are reflected in a wide variety of reports on education, such as the Department of Labor's SCANS report (1991) and a recent book by Murnane and Levy (1996), which address the question of what skills and knowledge will be needed for work in the 21st century. To summarize their findings, students need to be able to direct their own learning, communicate and work with people from diverse backgrounds and views, and develop ways of dealing with complex issues and problems that require different kinds of expertise. These, for the most part, are not skills that are currently emphasized in schools.

Analysis of Learning-Community Classrooms

To give a picture of what a learning-communities approach implies for schooling, we describe three exemplary cases of learning communities that have been set up in U.S. classrooms.

Brown and Campione's FCL Classrooms

Brown and Campione (1996) have developed a model they call Fostering a Community of Learners (FCL) for grades 1–8. The current focus of FCL classrooms is on the subject areas of biology and ecology, with central topics such as endangered species and food chains. There is an overall structure of students carrying out research on the central topics in small groups where each student specializes in a particular subtopic area; sharing what they learn with other students in their research group and in other groups; and preparing for and participating in some "consequential task" that requires students to combine their individual learning, so all members in the group come to a deeper understanding of the main topic and subtopics. Teachers orchestrate students' work, and support students when they need help.

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There are roughly three research cycles per year. A cycle begins with a set of shared materials meant to build a common knowledge base. Students then break into research groups that focus on a specific research topic related to the central topic. If the class is studying food chains, for example, the class may break into five or six research groups that each focus on a specific aspect of food chains, such as photosynthesis, consumers, energy exchange, etc.

Students research their subtopic as a group and individually, with individuals "majoring" by following their own research agendas within the limits of the subtopic. Students also engage in "crosstalk," talking across subtopic groups to explain, ask questions, and refine their understanding. The research activities include reciprocal teaching, guided writing and composing, consultation with subject matter experts outside the classroom, and cross-age tutoring. In the final part of the cycle, a member from each of the subtopic groups comes together to form a "jigsaw" group to share learning on the various subtopics and to work together on some consequential task. Thus, in the jigsaw, all pieces of the puzzle come together to form a complete understanding.

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The consequential task requires the different subtopics to be used together to form a common product or common understanding. The choice of consequential tasks is ideally made by the teacher and students together. In some cases the consequential task might be a bulletin board display, the design of a bio-park to protect an endangered species, a presentation to the community at large, or in some cases a test of students' knowledge. These tasks "bring the research cycle to an end, force students to share knowledge across groups, and act as occasions for exhibition and reflection" (Brown and Campione, 1996, p. 303).

Scardamalia and Bereiter's Knowledge-Building Classrooms

Scardamalia and Bereiter (1991, 1994) have developed a model they call Knowledge-Building Communities. CSILE (Computer Supported Intentional Learning Environments) is the name commonly applied to this model. The essential idea is that students work together to make sense of the world around them and work toward advancing their own state of knowledge and that of the class.

The model involves students investigating problems, such as how electricity works, in different subject areas over a period of weeks or months. As students work, they enter their ideas and research findings as notes in an on-line knowledge base. The software supports students in constructing their notes through features such as theory-building scaffolds (e.g., "My Theory," "I Need To Understand") or debate scaffolds (e.g., "Evidence For"). Students can read through the knowledge base adding text, graphics, questions, links to other notes, and comments on each other's work.

The central activity of the community is contributing to the communal knowledge base. Contributions to CSILE can take several forms:

1. Individual notes, in which students state problems, advance initial theories, summarize what needs to be understood in order to progress on a problem or to improve their theories, provide a drawing or diagram, etc.

2. Views, in which students or teachers create graphical organizations of related notes

3. Build-ons, which allow students to connect new notes to existing notes

4. "Rise Above It" notes, which synthesize notes in the knowledge base. Any of these kinds of contributions can be jointly authored.

When students feel a note makes an important contribution to the collective knowledge base, they can propose the note for publication. An editorial group and the teacher then decide whether to publish the note. At the end of the school year the class may decide on a selection of notes to remain in the knowledge base for classes that follow them. The goal is to engage students in progressive knowledge building, where they continually develop their understanding through problem identification, research, and community discourse. The emphasis is on progress toward collective goals of understanding, rather than individual learning and performance.

Lampert's Mathematics Classroom

Lampert (Lampert, Rittenhouse, and Crumbaugh, 1996) taught mathematics to fifth grade students for a number of years; during this period she developed an approach to teaching that reflected her view of an idealized mathematics community. The class usually starts with a problem posed to the students, which they work on alone or in groups, developing their solutions in notebooks that retain all their work during the year. After 20–30 minutes of work the class as a whole discusses the problem and various possible solutions. Lampert encourages students to discuss different ideas and solutions, so they develop a deep understanding of the mathematical principles underlying their work.

Lampert chooses problems that foster deep inquiry and mathematical argumentation by students. Students are encouraged to present different ideas and methods, and to discuss which are correct and why. There is an emphasis on how to resolve mathematical arguments by appeal to logic and evidence. Participating in the mathematical discussions, learning how to make mathematical arguments, and learning the language of mathematics (terms such as "conjectures" and "commutativity") are the central activities in the classroom.

Lampert orchestrates the discussion and picks up on certain ideas, revoicing them so everybody can understand. She is very much in control and uses various techniques to make sure students participate in the dis-

cussion. She opportunistically follows the ideas the students suggest in order to relate them to important mathematical ideas. The students are on an equal footing in the discussions, offering their ideas and discussing other students' ideas and arguments. She carefully orchestrates the discussion to maximize participation among the students. Her technique of asking students to explain other student's ideas is particularly effective in making them listen to and respect other students. The discussion involves students in a way that fosters understanding of the ideas and principles that the class is developing.

Principles for the Design of Effective Learning Communities

Below, we try to encapsulate what we have learned from the different cases into a set of principles for the design of effective learning communities.

Community-Growth Principle: The overall goal of the community should be to expand the community's knowledge and skills. To maximize its learning, the community needs to take advantage of the knowledge of all its members and what they learn.

Emergent-Goals Principle: The learning goals of the community should be co-constructed with the students and come out of the activities and questions that arise as students carry out their investigations.

Articulation-of-Goals Principle: The teacher and students should articulate the goals they are pursuing and the terms by which they will judge their success. All the students should develop the ability to judge if the goals have been met.

Metacognitive Principle: The community should keep asking itself what its goals are and if what it is doing will help it reach them. In addition, the community should evaluate what was learned and how well they did. The community should also try to identify at regular intervals what it knows and does not know.

Beyond-the-Bounds Principle: The community should attempt to go beyond the knowledge and skills within the community and the resources easily available to them. They should try to make sense of things for themselves and welcome new approaches and challenges.

Respect-for-Others Principle: Students need to learn to respect other students' contributions and differences. The more everyone is heard, the more sources of knowledge there are for expanding the community's knowledge. The rules for respect should be clearly articulated and enforced.

Failure-Safe Principle: There must be a sense that failure is okay, and that taking risks and an experimental approach will lead to more learning. Reflection without blame can help to ensure that the community learns from its mistakes.

Structural-Dependence Principle: The community should be organized so students are dependent on other students' contributions in some way, such as a common task that requires their joint effort. This fosters both respect for the other student and that student's self-esteem.

Depth-over-Breadth Principle: The students have sufficient time to investigate topics in enough depth that they gain real expertise in the topics. This is necessary to foster a sense of their own expertise and to support meaningful discourse among the students.

Diverse-Expertise Principle: Students develop the areas in which they are most interested and capable, with the responsibility that they share their expertise with the other students and the teacher. By developing diverse expertise, the community can deal with problems and issues that are too difficult for any individual to handle.

Multiple-Ways-To-Participate Principle: In order to advance its collective understanding, a learning community has a variety of jobs it needs done. Students may be more or less interested and adept at different activities, so there should be a range of activities in which they participate.

Sharing Principle: There needs to be a mechanism whereby knowledge and skills gained by different individuals are shared throughout the community, so that each student is both a learner and contributor to the community knowledge.

Negotiation Principle: Ideas, theories, procedures, etc. are constructed by a negotiation process among members of the community, and arguments among them are resolved by logic and evidence. The teacher needs to coach participants on how to critique other people's ideas without personalizing the critique.

Quality-of-Products Principle: The quality of the products produced by the community should be valued both by the community itself and by outsiders to the community. There must be standards that the community agrees upon as to what makes for good quality work, and these standards must be tested against the outside world.

Conclusion

A key idea in the learning-communities approach is to advance the collective knowledge of the community, and in that way to help individual students learn. This is opposed to approaches where learning is viewed as an individual pursuit, activities discourage the sharing of knowledge, and the goal is to transmit the textbook's and teacher's knowledge to students. The idea of learning communities in classrooms will grow as we try to address the needs of being able to reason through complex issues and problems, direct one's own learning, communicate and work with people from

diverse backgrounds and views, and share what one learns with others.

The learning-communities approach fits with the growing emphasis on lifelong learning. While in this article we have emphasized the role of learning communities in the classroom, this view of learning can naturally be extended beyond the classroom walls. In addition to children, there is every reason for a learning community to include parents and members of the wider society. With the addition of computer networks it becomes possible to include scientists and other professionals, as well as students around the globe, in communities that are trying to understand and deal with social and political ideas and issues (Scardamalia and Bereiter, 1994; Collins and Bielaczyc, 1997). Students will benefit greatly from interacting with more adults in learning situations. Thus, the learning-communities approach offers a way to end the isolation of young people in schools and integrate their learning with that of the wider society.***~B***

References

Brown, A., and Campione, J. "Psychological Theory and the Design of Innovative Learning Environments: On Procedures, Principles, and Systems." In *Innovations in Learning: New Environments for Education,* edited by L. Schauble and R. Glaser. Mahwah, N.J.: Lawrence Erlbaum Associates, 1996.

Collins, A., and Bielaczyc, K. "Dreams of Technology-Supported Learning Communities." In *Proceedings of the Sixth International Conference on Computer-Assisted Instruction.* Taipei, Taiwan, 1997.

Lampert, M.; Rittenhouse, P.; and Crumbaugh, C. "Agreeing To Disagree: Developing Sociable Mathematical Discourse." In *Handbook of Education and Human Development,* edited by D. Olson and N. Torrance. Oxford, England: Blackwell's Press, pp. 731–64.

Murnane, R. J., and Levy, F. *Teaching the New Basic Skills.* New York: Free Press, 1996.

SCANS Commission. *What Work Requires of Schools: A SCANS Report for America 2000.* Washington, D.C.: U. S. Department of Labor, The Secretary's Commission on Achieving Necessary Skills, 1991.

Scardamalia, M., and Bereiter, C. "Higher Levels of Agency for Children in Knowledge Building: A Challenge for the Design of New Knowledge Media." *Journal of the Learning Sciences* 1(1991): 37–68.

Scardamalia, M., and Bereiter, C. "Computer Support for Knowledge-Building Communities." *Journal of the Learning Sciences* 3 (1994): 265–83.

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