Chapter 9

Cooperative Learning

REFLECT ON YOUR EXPERIENCE

Read this instant messaging conversation, using the abbreviations below to help you:

<princesskat04> CMIAW but r paper is do W, Can we MIRL PLS?

<liljump3r> UCMU A3

<princesskat04> 9 @Changs?

<liljump3r> ok

<princesskat04> 143

<liljump3r> BFF

Abbreviations: CMIAW—Correct me if I am wrong, W—Wednesday, MIRL—Meet in real life, PLS—Please, UCMU—You crack me up, A3—Anytime, anywhere, any place. 143—I love you, BFF—Best friends forever. (http://www.webopedia.com/quick_ref/textmessageabbreviations.asp).

Kids today! Many folks have disbelief, confusion, or even fear and revulsion toward cell phone conversations, text messages, Internet chats, MySpace, or Facebook. Others believe that the technological advances of which our students take advantage allow the opportunities for cooperation and learning in and out of the traditional school setting (Prensky, 2008). What are your feelings and beliefs about students' and others' use of technology today? In what ways do you see students use technology to build knowledge and understanding cooperatively? How can you use technology to help students cooperatively learn? What are the pros and cons of incorporating technologies, like text messaging, into the classroom?

In This Chapter . . .

- ❖ Consider the effectiveness, inevitability, and sustainability of cooperation for human development and education.
- ❖ Appreciate the necessary balance of positive interdependence and individual responsibility in cooperative environments.
- ❖ Explore structured methods to cooperative learning, including scripted approaches, curriculum approaches, and group-building activities.
- ❖ Learn how cooperative learning integrates multiple perspectives for formative and summative assessments.
- ❖ Discover how digital immigrant and native perspectives about technology can lead to successful cooperative methods.

❖ Cooperation, Competition, and Individualism

Social interdependence to humans is like water to fish.

—David W. and Roger T. Johnson

D. W. Johnson and Johnson (1989) and D. Johnson, Johnson, and Holubec (1998) assert that all educational contexts are set up to be cooperative, competitive, or individualistic. Cooperative learning involves students (and others) working together, or co-regulating, for shared learning and goals. In comparing it to competition and individualism, D. W. Johnson and Johnson (1989) have shown how cooperation is more ethical, empirically supported, and integral to human development for most situations and outcomes in education and life. "Cooperation is the heart of our biology, . . . family life, . . . economic systems, . . . legal systems, . . . evolution as a species, . . . [and] worldwide community of humans" (D. Johnson, Johnson, & Holubec 1998, p. 12). Cooperative learning is particularly important for complex tasks, such as abstract and applied learning, human development, and emotional, interpersonal, and behavioral outcomes (D. W. Johnson & Johnson, 1989; Slavin, 1995). It appears to be effective across all groups and levels tested, with potentially more positive effects for students who are high achievers, who receive special education, or who come from diverse cultural and ethnic backgrounds (Slavin, 1995). When teachers build facilitative relationships with students through warmth, empathy, trust, and realness, students can further the cycle of cooperation with their peers with less teacher intervention.

Although cooperative environments have many benefits, most students perceive schools to be competitive institutions (e.g., grades, power struggles, conflicting priorities) (D. Johnson, Johnson, & Holubec, 1998). Though inferior for many types of

learning as compared to cooperation, competition can help skill practice, recall, and review at rates similar to cooperation. Successful competition requires perceived scarcity, winner(s), loser(s), clear rules, and short duration. Students also perceive some school activities as individualistic (e.g., homework, seatwork). The success of individualism involves independent, solitary action, and is frequently mythical, or at least short-lived in most situations, including learning. The president of the United States accomplishes next to nothing without hundreds if not millions of helpers. Individualistic learning can have similar effectiveness to cooperative learning when the task involves simple knowledge acquisition, clear rules, and limited duration, and promotes self-regulated learning in a context of cooperation (D. Johnson, Johnson, & Holubec, 1998). Perhaps the largest shortcoming of either competition or individualism is that they are not sustainable; they only succeed in short-term situations and must be surrounded by cooperative context to avoid relational disintegration and failures in positive outcomes, like poor teacher retention and students dropping out. The establishment of a community of cooperation is pivotal for sustainable learning environments.

Establishing a Community of Cooperative Peer Groups

> *Human beings, who are almost unique in having the ability to learn from the experience of others, are also remarkable for their apparent disinclination to do so.*
>
> —Douglas Adams

Learner-centered instruction (LCI) is thoroughly cooperative, prioritizing the fostering of facilitative relationships as one of the most foundational and influential practices in education. Facilitative relationships are vital and potent among all players in education, not just teachers and students. The field of cooperative learning refers to highly effective peer-support theories, structures, and approaches. Ideally, thorough understanding, motivated reflection and discussion, and sustained practice of learner-centered conditions, principles and practices will lead to the integration of a cooperative disposition in the teacher's personality. When such a disposition is built, any lesson can be facilitated rather than just taught. Johnson, Johnson, and Holubec (1998) empirically determined that reprioritizing cooperative learning structures from about 5–20% of classroom lesson time to 60–70% is ideal for engagement and achievement outcomes. Like the vital, but judicious, use of lecture and direct instruction, some use of individualistic and competitive structures appropriately balances resources and matches tasks to appropriate methods. Variety also increases enjoyment and responsibility for learners and teachers alike.

Ideally, teachers will have experienced optimal cooperative learning environments during their K–12 years or at least in their teacher preparation. Like most methods, cooperative learning is easiest to apply if over-learned (learned so well that it is automatic and under your skin, and allows more attention for actual situations). Unfortunately, cooperation is not frequently over-learned during the school years or teacher training. Even when over-learning occurs, every class requires adaptations to foster a cooperative atmosphere.

Discussions within the classroom about the purpose and methods of cooperative learning help to establish practices in a particular class. Teachers can and should begin early in the school year facilitating discussions with students about cooperative learning alongside its use. Teachers may find that some students express a desire for a more heavy-handed lead from the teacher, consistent with their previous experiences. However, these early discussions offer an opportunity for students to learn how their input influences the practices of the classroom community and their co-regulated and self-regulated learning.

Boaler and Humphreys (2005) offer an example of this type of discussion, where mid-year, Cathy Humphreys stops her class in the middle of a period to discuss some students' reluctance to participate in whole-class discussions. Humphreys expresses the importance of classroom conversations for the learning and sharing of mathematics. Students, in turn, express different opinions about the pressures, benefits, and constraints of reporting to the whole class from their cooperative groups. Some students felt confirmed in their participation, a couple seemed to participate more, and a few remained reluctant. Humphreys admits in this discussion that she had gone frustrated too long by students' lack of "buy-in" to these discussions about mathematics and should have had this "meta-discussion" sooner in the year, given its mixed results. Preferably, such discussions should never be initiated out of a teacher's anger lest the cooperative intent be incongruently conveyed.

Essential Conditions for Successful Cooperative Learning

> *Cooperation is by far the most pervasive and important type of social interdependence. We do not have a choice. We have to cooperate.*
>
> —David W. and Roger T. Johnson

Successful cooperative learning practices have several common characteristics. Slavin (1995) advocates that the research supports the balance of two essential conditions: (1) **positive interdependence**, or recognition that to group members their fate is interconnected, and (2) individual responsibility in learning. D. Johnson, Johnson, and Holubec (1998) memorably define positive interdependence this way: "Students must believe that they sink or swim together" (p. 22). Kagan (1994) offers the acronym PIES (i.e., Positive interdependence, Individual accountability, Equal participation, and Simultaneous interaction) to explain the essential conditions for successful cooperative learning. To succeed, cooperative learning needs to highlight and/or structure how each learner's efforts (responsibility) benefit both the individual and the group. For example, the outcome of an assignment could be a single group product, but the grade might be awarded as the average of each student's individual contributions.

Finding the balance of interdependence and individual accountability is facilitated by promotive activities that support each learner and social skills that foster decision building, communication, and conflict resolution (D. Johnson, Johnson, & Holubec 1998; Kagan, 1994). Likewise, students learn to co-regulate through group processing, or discovering what actions are helpful or unhelpful to each group member. Most powerfully, teachers need savvy interpersonal skills to model and clarify ways of

interacting to help students cooperatively navigate social and academic situations in the classroom and beyond. Practical interaction strategies can also be used with young learners, students with special needs, or those who request or need more structure, such as use of a participation puppet or participation wheels or balls. Participation puppets concretize who is allowed to talk or do a specific activity at a specific time when one is given a puppet. Participation wheels or balls provide a visual-motor sequencing procedure of who will talk or do a specific activity to encourage listening, turn taking, preparation, patience building, and other interdependence and accountability skills (Riner, 2000). Positive interdependence and individual accountability dovetail with the two highest levels in the Pyramid of Student Engagement (Figure 4.1 on p. 53): social connections and self-regulation.

Effective, whole-group problem solving is characterized by students being obligated to interact with common purpose. Thought is required to construct and implement appropriately cooperative assignments. One of students' biggest misconceptions regarding group work is that the most efficient, and hence best, way to accomplish the task is to divide and conquer. In other words, students often assume that if the task involves a certain number of steps, it is best to divide these steps among group members, carry out the steps individually, and then come back together as a group, and the goal will then be accomplished. This thought process is easily perpetuated if the group task is not designed in such a way that real collaboration among group members is encouraged. For example, if the task is for a group of four students to solve four mathematics problems, who can fault a group for dividing up the problems among the members? If the teacher designs the task as one problem with enough complexity that discussion among group members is necessary for progress, then more collaboration is built into the task and the cooperative benefits are more likely to occur. Students need to teach and learn from one another. While a community that balances interdependence and individuality is central to cooperation, cooperative learning can be informal or structured as will be explored in the next section.

Things to Think, Talk, or Write About

Huetinck and Munshin (2007) and many online sources offer several examples of activities that help build an appreciation for interdependence. An example involves having one person put together a puzzle blindfolded while the teammate guides the person through the process with directions. Another activity asks participants to unscramble geometric figures that have been distributed among three or four group members. The key to this activity is that group members cannot take pieces from other members but, instead, are only allowed to give pieces to other group members. Both of these group-building exercises work because they encourage members to work together toward a common goal rather trying to accomplish each group-members' individual goals. Find a source or ask your students to find a source for team-building activities. Try one in a group, and discuss with peers how you can adapt these activities for use in your classrooms.

❖ Structured Approaches to Cooperative Learning

There are many structured approaches to cooperative learning, such as (1) those that follow specific scripts, like jigsaw methods (e.g., Aronson, Blaney, Stephin, Sikes, & Snapp, 1978; Slavin, 1994), (2) curriculum or lesson approaches, with grade- and subject-specific materials (e.g., Slavin, 1994), and (3) group-building activities, such as ice-breakers and games (D. Johnson, Johnson, & Holubec, 1998). Table 9.1 describes some characteristics on which the three approaches have similarities and differences.

Table 9.1 Characteristics of Three Approaches to Cooperative Learning

Approach	*Amount of Structure*	*Curriculum Specific*	*Heterogeneous Grouping*
Scripted	High	No	Yes
Lesson	High	Yes	Yes
Group building	Low	No	Preferred

These approaches generally emphasize **heterogeneous grouping,** or forming groups of learners with different characteristics (e.g., not all boys, not all "popular" kids). Heterogeneity should involve more than differences in achievement levels. Heterogeneity provides an opportunity for students to learn how to interact and accommodate across multiple learning styles, personalities, cultures, or other salient differences. In classrooms where these differences are valued and shared, all students are learning from one another, socially and academically. Sapon-Shevin (1999) warns, however, that heterogeneous grouping alone is not sufficient to address existing problems of discrimination and tolerance in schools, which also requires building relationships with administrators and others.

Teachers can initially allow students to self-select into groups given minimal guidance on group composition, such as instructing students that groups must contain three or four members, so long as teachers let the class know that the compositions of groups will frequently change. The freedom to choose these first groups may not lead to the desired compositions, but may provide the teacher with some insight into the social and academic dynamics that may exist between particular students, for good or bad, and share control while increasing comfort for many learners. Teachers will likely have more insight into ways to achieve heterogeneity given their own particular set of students. Random assignment tools, such as computers or playing cards, different colored chips or other small objects, can help. Objects that interest learners (stuffed animals for elementary-aged children) or are directly related to course content (coins from around the world for cultural or economic studies) have secondary engagement

and achievement purposes. Often, in order to get into groups in mathematics classes, we will have students group themselves according to some accessible quantitative characteristic about themselves, like their birthday's distance from today (i.e., closest with closest, farthest with farthest). This unique way of grouping offers some level of randomization as well as an introduction into problem solving in which our students see some immediate relevance.

Cooperative teachers regularly monitor small groups to provide guidance and informally assess, but encourage group members to first use the group and not the teacher when they have questions. One technique we have used to promote interdependence is to allow only a limited number of questions of the teacher from each group. The co-regulating discussions that should occur within groups can be short-circuited if teachers allow groups to ask questions without limit. In our experience, cooperative groups will often not need to ask questions of the teacher after some degree of socialization, particularly at middle, secondary, and higher education levels.

Scripted Cooperative Approaches

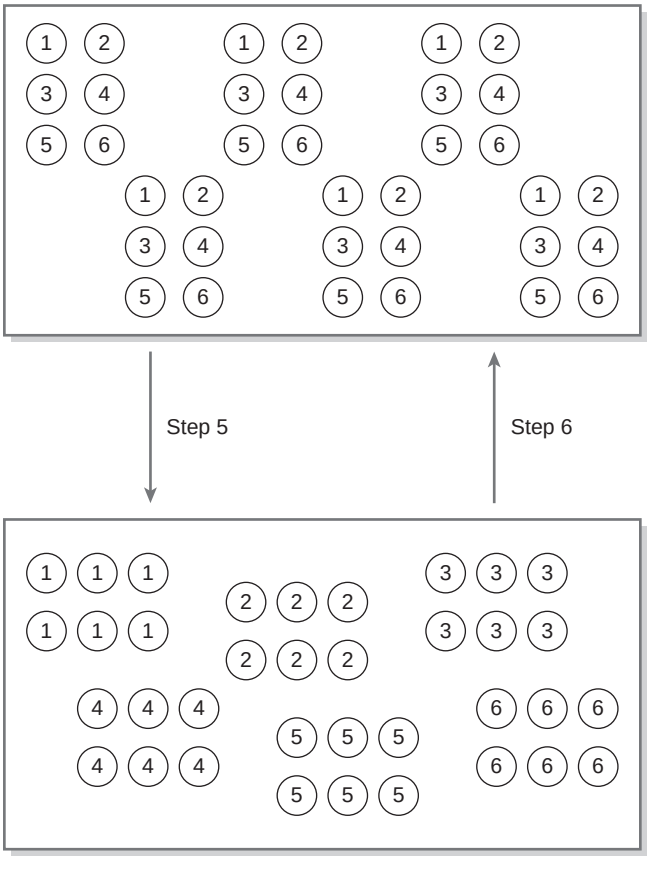
Scripted cooperative approaches follow explicit directions in procedures but are able to be generalized across curriculum, grade, and ability level. The **jigsaw method** asks groups of students to form a team, typically of four to six persons, individually learn material and become an expert in a specific section, reform teams to all of the experts in a given area, and then reassemble to share, teach, and discuss with the original teams following the expert meetings. Here are the steps:

1. Form groups of six, ensuring that each group is heterogeneous.
2. Ask students to skim a project and include subtopics.
3. Have students divide the subtopics among the group members. Each group member will become an expert on the designated subtopic.
4. Research individually the designated subtopic.
5. Form new groups, each comprised of the respective experts.
6. Regroup to the home group, and have each expert teach to the group so that all students understand all subtopics.

Figure 9.1 shows how a class of 36 students can be arranged into home groups of six, regrouped into expert groups of six (Step 5 above), and then return to their home groups (Step 6 above).

This process should be adapted to meet teachers' classroom needs, but the basic structure of having the students become experts in their groups and then sharing that expertise with their home group will likely remain the same for any derivation of the jigsaw method. Some purposes that may not immediately come to mind when considering the jigsaw method include laboratory assignments in science, skill development

Figure 9.1 Jigsaw Method of Cooperative Learning



in mathematics, or writing assignments in language arts. Whether specifically using jigsaw or not, peer-teaching in pairs or larger groups will likely be appropriate to implement cooperative learning.

Curriculum or Lesson Approaches to Cooperative Learning

Curriculum or lesson approaches to cooperative learning use standardized materials and procedures to teach specific content in an empirically supported manner across classrooms. Examples include Student-Team-Achievement Divisions (STAD) and Cooperative Integrated Reading and Composition (CIRC) (R. J. Stevens & Slavin, 1995). STAD calls for four- to five-person heterogeneous groups and is used for

material with clear, right answers, not abstract, creative, or elaborative work. Examples include arithmetic calculations, subject–verb agreement, basic geography, and fact acquisition. After a teacher lecture, groups ensure that every member has mastered the material. They can check each other's accuracy, ask questions, and informally assess that everyone understands, after which students individually take quizzes on the material from the teacher. Individual scores are compared with the individual's early scores and summed with group members to form team scores, which can then be recognized or rewarded at the team level. Rewards can follow a short-term competitive variant called Teams-Games-Tournaments (TGT), where ongoing relative success is tracked (Slavin, 1994).

CIRC (R. J. Stevens & Slavin, 1995) also utilizes teams of four but is used mainly for upper elementary students. Learners read to each other; predict plot developments; summarize plot, theme, setting, and other story features; and write and edit others' papers to practice comprehension, spelling, decoding, vocabulary, and other language skills.

Group Building and Ice-Breakers

Group building and ice-breaker activities are widely available online and in print and are often helpful at building peer relationships and cooperative learning atmospheres by connecting and engaging people. "Halves" or "Other Half" refers to an ice-breaker that we have used during first class meetings. This activity is not traditionally content based, but our variation is to relate the "halves" to the course content, using introductory or review material. To begin, students are given cards with some piece of information. This information, when paired with the information from another card, possessed by another student, forms two halves of a relationship from the course content. Students are required to interact with others to find their matching card, or "other half." The key feature of this ice-breaker, what makes it effective, is that the activity requires students to interact with each other in ways that are both social and academic. When teachers use this ice-breaker at the beginning of the school year, we suggest that the students introduce each other to the class once matched. Here are some content specific examples:

- English or literature arts—Pair famous lines from poetry or pop culture with their authors (examples at http://www.saidwhat.co.uk or search online).
- Secondary and higher education mathematics—Use two equivalent expressions. For example, $\frac{x^3 y^2}{x y^4}$ and $\frac{x^2}{y^2}$, or $\tan x$ and $\frac{\sin x}{\cos x}$.
- Second language—Pair English phrases with their translations.
- Secondary or higher education science—Pair equivalent quantities with different units of measure, or chemical compounds with their name. For example, 3.00×10^8 m/s could be paired with 1.86×10^5 mi/s, or HNO_3 with "nitric acid."
- Elementary social studies—Pair capitals with their state or nation, or important historical events with significant associated figures, places, and/or dates.

Things to Think, Talk, or Write About

Teaching students how to articulate effective questions is a good goal for helping students become effective inquirers and cooperators. Kagan (http://www.kaganonline.com) offers one method: a product called Question Dice, a pair of dice with words on each face—one die with Who, Which, Why, How, What, and Where/When, the other with Would? Might? Did? Can? Is? and Will? The dice are to be rolled and the words from each are combined, providing question starters. These question starters prompt students to come up with their own, meaningful questions about whatever topic they are studying. Kagan suggests that teachers provide cooperative groups with a set of question dice and require groups to determine questions, using the dice, and then search for the answers to these questions. Groups can also exchange questions. For some content areas and topics, however, not all of Kagan's question starters make sense. Think about how you could use these dice in your classroom. Without much expense, you can customize your own sets of question dice by using foam cubes, like those used in gymnastics pits and available online for under $1. Determine what each face for each dice would contain, and then consider how you could incorporate your new dice into your instruction, including what question starters your dice would produce.

❖ Feedback and Assessment in Cooperative Learning

Experience is a hard teacher because she gives the test first, the lesson afterward.

—Vernon Law

Some teachers resist using cooperative learning because of concerns about group assessment difficulties and not knowing whether students are "getting it" on an individual basis. Given end-of-year exams, the pressures of high-stakes tests, and traditional notions of accountability, the teacher's knowledge of each individual's understanding is particularly important. In cooperative environments, assessing students' knowledge and understanding is possible in summative and formative ways. In what follows, we discuss both of these aspects of assessment and ways teachers can effectively provide feedback to groups and individuals.

When groups are truly cooperative, each individual in the group is responsible for the work and success of the group, as well as his or her own individual learning. Group members are likely well aware (and should be) of the contributions to the work of the group made by each individual. Students usually have a consistent sense of whether they themselves or their peers are "getting it." Students actively and spontaneously suggest differentiated attempts to resolve a learning snag when they or their peers are not "getting it." Formal self and peer evaluations of group members' performances can also be used to assess these contributions. Teachers can use the group's assessment to assign individual and group grades, learn when interventions need to be made to help groups work more smoothly or equitably, and address specific learning needs within groups. Table 9.2 contains a sample rubric that teachers can use for self- and peer assessment. Additional categories can be added. When students provide average or low ratings, there is opportunity for discussion on how to increase cooperation. Each member of the group would record their evaluation of the work of all group members, including themselves, as

Table 9.2 Peer and Self-Evaluation Rubric Example for Cooperative Group Activities

Indicator of Cooperation	*Team Member:* _____	*Team Member:* _____	*Team Member:* _____	*Team Member:* _____
Brings necessary supplies	1 2 3	1 2 3	1 2 3	1 2 3
Gets along with other members	1 2 3	1 2 3	1 2 3	1 2 3
Compromises during disagreements	1 2 3	1 2 3	1 2 3	1 2 3
Shows willingness to discuss	1 2 3	1 2 3	1 2 3	1 2 3
Meets deadlines	1 2 3	1 2 3	1 2 3	1 2 3
Provides positive feedback to group members	1 2 3	1 2 3	1 2 3	1 2 3
Overall contribution	1 2 3	1 2 3	1 2 3	1 2 3

formative and/or summative assessments of their cooperative groups. Teachers can require identification of both strengths and weaknesses in self- and peer evaluations.

Whole-class or small-group discussions can help teachers informally assess, but teachers should not rely too heavily on discussions for this purpose as discussions are less thorough and subject to more situational than learner variables. Erwin (2004) suggests using a KWL (Know, Want, Learn) approach to class discussions. Teachers and students can contribute in any of the three steps for teaching, learning, and assessment. Teachers may want to facilitate the use of a KWL approach with a graphic organizer, particularly when helping students become accustomed to structuring discussions in this way. Figure 9.2 provides an example of using KWL with curriculum content consistent with second-grade North Carolina Standard Course of Study for social studies (http://www.dpi.state.nc.us).

Cooperative test construction (also known as student-made tests) involves students and teachers planning and writing assessments to increase learning and motivation without compromising test validity for summative purposes. Ashtiani and Babaii (2007) conducted a study, and reviewed several other studies, investigating the effectiveness of cooperative test construction for student achievement, test anxiety, and motivational outcomes as compared to traditional teacher-made tests. They found that students do have better outcomes when approaching learning and assessment with cooperatively constructed tests. Validity is best when teachers clarify the specific content to be taught, items are somehow discussed and selected, wording is edited slightly from student constructions, teacher-made items appear alongside student-made ones, and the technique is used more than once to work out the kinks. Some of the reasons for the success of cooperative test construction include encouraging of long-term studying (avoiding cramming), building student efficacy, encouraging co-regulation by increasing the ability of learners and teachers to think in each others' roles, helping learners sort material

Figure 9.2 Example of KWL Use With Grade 2 Curriculum on Different Family Structures

Know

- I live with my mommy and sister.
- My grandma lives with us.
- I thought families were only a mommy, a daddy, and kids together.
- I live with my mom and her boyfriend and my cousin.

Want

- Is it better if a mother and a father live together?
- What kind of help is there for single moms?
- Can someone have two fathers?

Learn

- Families can be blended with stepparents, brothers, and sisters when parents are divorced and remarried.
- Extended families consist of aunts, uncles, cousins, grandparents, nieces, and nephews.
- Families can include extended relatives and close friends who live together.
- You can still be a family even if a mommy and daddy don't live together.

according to importance and organization, and providing teachers and students alike more formative feedback about what is and is not understood well. Of course, this method also shares control and choice, potentially increasing the authenticity of the task and the quality of the relationships between learners and students.

❖ Technology Applications

The real problem is not whether machines think but whether men do.

—B. F. Skinner

Teachers and students have access to applications of technology that can encourage cooperative learning, particularly for increasing feedback and formative assessment. We provide examples below of two such Web-based applications.

Buzzword (http://www.buzzword.com) is a free, secure, Web-based word processor with features to help students and teachers share and co-create written products and requires a valid e-mail address. One of Buzzword's most important collaboration features is the ability of the user to designate others as coauthors, reviewers, or readers. Coauthors have the same access to modify documents as the original author, reviewers can mark up a document with comments, and readers can only read the shared document.

Teachers of any content area, whether writing intensive or not, can direct students to compose on Buzzword and then "turn in" the product at formative or summative points in the writing process by designating the teacher as a coauthor or reviewer. Though necessary when students ask for more assistance, we suggest that teachers not act on their own impulse to expertly correct students' writing, but rather comment or facilitate discussions among authors through questions that guide students to self-assess

and peer-review their writing. Using Buzzword, students can collaborate on writing that is housed on a computer server accessible with any Internet connection.

Students and others alike today look online when they are sincerely curious for answers to whatever questions they have, whether for class or not. Wikipedia has become "the world's encyclopedia," with over 10 million articles and 250 languages, is the most frequented nonprofit Web site, and is the eighth most frequented Web site overall (http://en.wikipedia.org/wiki/Wikipedia). Although Wikipedia is not without criticism on several grounds, it can be a valuable "first step" in the research process and has been growing exponentially both in size and significance in recent years. For secondary and higher education settings, we have suggested that learners actively familiarize themselves with Wikipedia, and learn material by following these steps:

1. Go the site (http://wikipedia.org).
2. Search about anything you want.
3. Then, search about something related to the subject matter of the class; again, make sure it is something you want to learn about.
4. Follow the links within articles to learn more, and let yourself "wander around" until you find a dead end or place you want to know more than it can tell you.
5. Formulate a question that remains unanswered or under-answered in Wikipedia (i.e., find a topic that lacks info).
6. View the discussion, history, and related links near your topic.
7. Create a free account (register yourself as a user/author/editor).
8. Add one paragraph of information.
9. Share with your class or cooperative group members what you have done (e.g., give the topic's name).
10. Go back and view what classmates have done, and edit further as you can.
11. Check to see how your contribution has fared in the future, such as at 1- and 4-week intervals.
12. Continue the revisions as you learn.

Authentically familiarizing yourself with Wikipedia (e.g., pursuing guided inquiry) in this way accomplishes many engagement and achievement outcomes, including the building of self-regulated learning, critical thinking, and cooperative skills within both a classroom and global service context.

Wikipedia is just one example of wiki technology that can be helpful in guiding authentic and inquiry learning tasks. According to http://www.techterms.com/definition/wiki, "a **wiki** is a Web site that allows users to add and update content on the site using their own Web browser." Individuals can start their own wikis hosted on several sites created for such purposes, such as http://pbwiki.com. Buzzword, discussed above, shares some features with other wiki platforms. Each wiki hosting site supplies discussion forums and instructions on ways to set up and use wikis in several contexts, including educational ones. Wikis offer students a place to collaborate online to increase student engagement, develop educational communities, and deepen their understanding of the targeted content.

Digital Evolution

Throughout this chapter and the book, we have attempted to describe various Internet-based applications teachers can use to enhance the educational experience of their students. As rapidly as the Internet and the technology driving these applications is changing (e.g., Java, Ajax, Air), these applications will likely be replaced by slicker and more efficient applications that will be more user friendly (but also potentially intimidating) than previous generations of Web-based applications. The primary point we hope readers will take away from these discussions is the pedagogical potential to make our classrooms and schools more learner centered through increased relevance, self-regulated learning, innovative utilization of available resources, and, perhaps most important, contexts for cooperative community building. As Prensky (2008) says, teachers need to turn the lights on, not power down their classrooms.

Our students and many of the readers of this book might be considered digital natives. Digital natives are those who have been raised in a cell-phone-reliant, computerized, Internet-connected world (Prensky, 2001). In contrast, many readers and both of the authors of this book would easily be considered digital immigrants, trying to adapt to a new culture. The digital native-immigrant concept has several implications for teachers aiming to produce innovative, learner-centered classrooms. For example, we have recently posed the question to our students, "How many of you know what Web 2.0 is?" Almost none know what this term means, but almost all are using Web 2.0 applications, such as Facebook (http://www.facebook.com), MySpace (http://myspace.com), and Google (http://google.com) and its many applications (e.g., Google books, maps, scholar, shopping, images). In a similar way, some immigrants who learned English in an academic setting will have a vocabulary that surpasses many native English speakers. However, these immigrants may likely take much longer for the dominant accents and culture of America to become second nature. Similarly, digital immigrants can know about Web 2.0 applications and their applicability to the classroom; however, these immigrants may struggle to keep up with the mind set of accepted uses of technology that the native may take for granted, particularly interactive and Web-based applications. For example, digital immigrant cell phone users view the cell phone as a convenient way to make phone calls as we have done for years with landlines. In contrast, digital natives also view the cell phone as a natural extension of their identity, relying on them as a "natural" way to stay in constant contact with friends and family through videos, pictures, and text messaging.

As teachers and users of technology, digital immigrants have to jump into the flowing river at some point without the fear that what they learn will be soon out of date. It will immediately be out of date. This is the nature of the changes that we are experiencing as a technologically advancing society. However, technologies can remain useful long after they are out of date (e.g., pencil, landline phones), and newer technologies can be easier to not just learn, but also accept and integrate, when one attempts to swim in the river earlier rather than later. Whether in a technology-mediated or face-to-face venue, cooperative learning approaches are invaluable to the learner-centered classroom, but present challenges with which to adapt. The case study below poses a frequently encountered challenge to consider and prepare for.

❖ CASE STUDY: I Want to Work by Myself!

Ms. Morrison teaches eighth-grade mathematics at Mutual Middle School. She is in her fourth year as a lateral entry teacher after 17 years in accounting. Ms. Morrison considers herself to be learner centered in most ways but, like many teachers, feels the pressure of high-stakes testing and a local community very concerned with grades and test performance. Ms. Morrison is earning her master's in education at a local university and has been influenced by reform-based mathematics instruction. She believes strongly in the cognitive and social benefits of cooperative learning. She also believes that students need more of a voice in their education.

Ms. Morrison has experienced much frustration this year with Sarah, one of her highest achieving students. Sarah started off the school year complying with Ms. Morrison's requirements that students work in cooperative groups. Within a few weeks, however, Sarah began to complain that she was doing all the work for the group, despite Ms. Morrison's efforts to structure group work to be truly cooperative. Sarah pleaded with Ms. Morrison to let her work by herself. Ms. Morrison initially refused Sarah's requests, but after Sarah's mother came to the school and reiterated Sarah's request, Ms. Morrison felt obliged to give Sarah individual assignments. Ms. Morrison sought the advice of her administrator, who advised that she not require Sarah to rejoin the cooperative groups. Though the situation has been resolved in keeping with Sarah's, the parent's, and the administrator's advice, Ms. Morrison continues to struggle, feeling her dilemma was not best resolved. Ms. Morrison believes that for the good of Sarah and her classmates, Sarah could have learned mathematics and social skills better. Perhaps most important, Ms. Morrison wants to learn from the situation to adapt in future situations. She seeks your advice as a colleague.

Reflections on the Case Study

1. You want to convey understanding to Ms. Morrison. Write an empathic statement on how Ms. Morrison feels. Use this form: "You feel _____ because _____" (include at least two feelings and possible reasons).

2. As most people do, she tells you more about her feelings and reasons after you empathize with her. She develops some new ideas about what she could have done differently with Sarah's parents and her administrator. She thanks you, but then decides she still wants some advice about how you think she could have better handled it with Sarah. You advise her to demonstrate better empathy to students when they first make a request like Sarah's. Write an empathic statement as if you were Ms. Morrison responding directly to Sarah when Sarah makes her request. Do not answer the request, simply state empathy for Sarah's feelings, situation, and desires.

3. Next Ms. Morrison wants to know how to tactfully balance her perspective with the student's in order to seek less of a win-lose resolution where she loses. Understanding *both* Sarah's and Ms. Morrison's perspectives, write or practice saying something tactful she could say to students to convey both perspectives.

4. Consider how the characters' situations are like those you have experienced from teachers', parents', students', administrators', or colleagues' perspectives. Write or share with a peer what you learned from this vignette.

SUMMARY

Learner-centered instruction emphasizes cooperative relationships between all persons in education, including peer relationships. To be successful, cooperative peer learning requires a balance of positive interdependence and individual responsibility. Cooperative learning has been shown to be reliably more successful and sustainable, with broader positive effects and fewer negative effects, when compared with the competitive and individualistic structures that students mostly perceive schools as having (D. W. Johnson & Johnson, 1989; D. Johnson, Johnson, & Holubec, 1998). Cooperation, competition, and individualism have their place and can be combined within an atmosphere characterized by a majority of cooperative procedures. In addition to an informal approach that asks students to do group building, participate in ice-breakers, or form small groups to discuss material, share, or work on a project, there are also formal, scripted, or curriculum-driven cooperative approaches. Assessment in cooperative learning is best done formatively in addition to summatively, reflecting both interdependence and individual accountability. Technology mediates the cooperative relationships of today's digital native learners and provides opportunities for teachers to better facilitate. In the next chapter, you will expand your understanding of LCI beyond the classroom, exploring how you can build relationships with administrators, parents, other teachers, society, and even yourself to help your students succeed better.

SUGGESTED RESOURCES

Johnson and Johnson are leaders in the field of cooperative learning and provide access to many resources and books at www.co-operation.org.

Gillies's *Cooperative Learning: Integrating Theory and Practice.* (2007) provides an accessible text introduction to cooperative learning.

There is an International Association for the Study of Cooperation in Education. Learn more at www.iasce.net.

A rapidly growing collection of Web 2.0 sites can be found at http://g02web20.net, including some where you create your own unique wikis, such as wetpaint (www.wetpaint.com), or collaborative applications like Adobe Brio (http://labs.adobe.com/technologies/brio) and SlideShare (www.slideshare.net).