

Chapter 6

Knowledge is Powerful

Students are tested so often to see what they do not know that they may have difficulty recognizing the importance of what they do know. *Knowledge is powerful*, and it becomes more powerful as information is accessed more quickly, evaluated faster, and integrated more completely.

The concept of power has a negative connotation as well as a positive one. In the traditional college classroom, power is associated with the professor. In the cooperative learning environment, power should be associated with *knowing*. A person who *knows* how to do something can do it. A person who *knows* has information to share with others. A person who *knows* can be a producer rather than a consumer.

Teachers are responsible not only for helping students remember facts and understand relationships but also to use technology to process information effectively. As hyperlearning technology advances and technology makes data storage a trivial concern, the “...*measure of human competitiveness in the HL [hyperlearning] world will be not what you remember, but what you can understand*” (Perelman 1992). Recall has traditionally been a high priority in higher education. *Perhaps it is better if students are held responsible for remembering less but understanding more.*

LEARNING LESS BUT KNOWING MORE

Learning less yet knowing more may seem like a paradox, but it is an important concept. We cannot learn all that is available in books and we cannot know how to do all the

calculations that have been made. We must apply specific concepts to problems at hand, using conceptual problem-solving power.

Conceptual Power

An experience I had in 9th grade is an example of how the conceptual approach provides the “power” for any number of answers while a simple answer applies to one situation only.

My general science teacher demonstrated the effect of air pressure by placing a rubber diaphragm over the end of a thistle-tube. When a suction pump lowered the air pressure inside the thistle-tube, the rubber stretched into the tube as the air pressure was greater on the outside of the tube than on the inside. In the test that followed, the teacher asked “How far will the rubber go in if the end of the thistle tube is covered with glass and sealed with wax?” He expected “not at all” for an answer. My answer? It would go in until the pressure was equal on both sides of the diaphragm.

My conceptual answer applied to all situations. Whatever the air pressure is on either side, the rubber would assume a position of balance. The teacher marked my answer wrong based on that one case. My conceptual answer was valid in all cases. *That experience 50 years ago has been an important benchmark in my approach to teaching.*

How do we promote conceptual power when there is so much information available to be learned? Information retrieval is not the challenge. The challenge is to make the higher-level connections among the information in order to

develop insights, promote understanding, create knowledge, and acquire the skills needed to solve problems. As Perelman (1992) states: *“The job of hypermedia alone is to inform; its job as part of the fabric of hyperlearning is to empower.”*

Maximizing Problem-Solving Power

How do we maximize problem-solving power in higher education? There is no simple answer to this question, but some factors that contribute to it can be identified.

Identifying basic patterns. There are many basic patterns in the world...social patterns, biological patterns, physical patterns...and *learning more about these basic patterns is one way of maximizing problem-solving power.*”

Transferring knowledge from one problem to another. After identifying basic patterns, we can transfer knowledge from one problem to another. Most problems are not new, but are variations of old problems. *That is why it is so important to understand basic concepts and to recognize basic patterns in the world.*

Using the current knowledge of students. Students have current knowledge in many different subjects. This knowledge can be used to promote knowledge integration and seamless, interdisciplinary courses. *Professors and students are, collectively, in a position to integrate knowledge from many subject areas into more complex holistic understanding.*

Using the in-depth knowledge of professors. Professors have more in-depth knowledge in their specialties than their students have. They have more experience and perhaps more wisdom as a result of their greater experience. Professors should be effective facilitators and catalysts in the learning environment, *stepping in with key information at the*

right time, stimulating student thinking, and maximizing their problem-solving power.

Group knowledge. The power of two minds is greater than one of those minds alone. Since college students have current knowledge in several subjects, working on problems in a group setting makes problem-solving more effective. *College students have knowledge and problem-solving skills that should be shared with other students in an interactive, cooperative problem-solving environment.*

Using Decision-Making Power

Since cooperative work involves decision-making by groups rather than supervisors giving orders, decision-making is not just a skill to be learned; it is an essential component of group power. What should students learn about decision-making in a cooperative learning setting? Some ideas follow.

Identifying problem and options. Many problem-solving situations involve two or more options. A group of students will likely identify more options than an individual will. Giving students opportunities to discuss the advantages and disadvantages of different options is an important part of their education. *Expanding horizons by increasing the number of problem-solving options is one of the values of group work.*

Sharing individual feelings. Each student in a learning group should feel that their opinion is important. Professors can nurture this by arranging groups so responsibilities rotate among the students, giving everyone chances to both lead and follow. *If only the most experienced students have leadership opportunities, less experienced students may withdraw even more.*

Respecting others. Respect for the opinions of others and considerations of their ideas contribute positively to the willingness of students to make contributions to group discussions and decisions. *Students should learn from and respect each other rather than put each other down.*

Compromising. Individuals must compromise when working in a group since each student cannot have his/her way. Good feelings about each other make it easier to compromise, while arguments and accusations divide groups and decrease group effectiveness. Discussion and agreement on compromises need to be practiced, and a cooperative learning environment provides many opportunities for negotiation. It may be hard for professors to listen to students work things out amongst themselves when the best decision could be imposed on them. *Professors must be patient; students are learning while negotiating!*

Group Confidence

The success of cooperative learning environments depends on confidence among different groups of people. Confidence does not just happen; it comes from carefully designed strategies that build confidence in an interactive learning environment.

Confidence of professors in themselves. Confident professors are essential in a cooperative learning environment. Giving up center-stage and working with students rather than lecturing at them increases the range of questions that might be asked. Professors who have confidence not only in what they know but also in how they respond when they do not know are comfortable working cooperatively with students. *Confident professors who can deal with uncertainty are good models for students.*

Confidence of students in professors. Confidence of students in professors is essential in a cooperative learning environment. One of the most effective ways for professors to gain the confidence of students is by participating with them in the learning environment. Professors gain the confidence of students by working with them rather than grading them without a chance for them to improve their work. *Learning together is demonstrated rather than dictated in a cooperative learning environment.*

Confidence of professors in students. Professors demonstrate confidence in students by giving them significant responsibilities and learning opportunities. Patience is needed often as students learn how to share what they have learned with others. It is tempting to revert back to an authoritative “do as I say” approach when progress seems slower than expected. *Students respond positively to the confidence professors have in them; recognition of their good work increases their desire to do even better*

Confidence of students in themselves. Students who have confidence in themselves are more likely to learn more than students who are insecure. How can teachers help students become more confident? Some students need smaller assignments in order to be successful while others can handle larger ones. Activities that give individuals positive experiences within groups help increase their confidence. Giving them opportunities to share oral and written work, helping them feel like they are productive members of a learning group, recognizing their contributions with sincere appreciation and reward...*such positive experiences all help students gain confidence in themselves.*

Confidence in learning groups. Confidence in learning groups is enhanced when students discuss, make decisions, meet goals, and produce educational materials of value to others. Group confidence increases when students help each

other understand concepts and solve problems, when the group comes up with answers to questions, and when groups are given responsibility for assessing their own knowledge. *A sense of accomplishment, whether by an individual or a group, always leads to higher levels of confidence.*

Group Productivity

Group productivity is one of the keys to a successful cooperative learning environment. Group productivity depends on the productivity of individuals and subgroups within the larger group. A feeling of mutual responsibility within a group is important; each member of a group should feel responsible for the success of others in the group and the group as a whole. Some major factors that contribute to group success and productivity are discussed below.

Decision-making. Decision-making needs to be shared within a group if everyone is going to feel important. Professors should not tell groups what to do and when to do it; the group should decide such things so there is a feeling of ownership and responsibility by members of the group. Professors should create a learning environment in which students develop social skills and want to participate in decision-making. Group progress may seem slow at times, but a cooperative learning environment is not a dictatorship. *Students should feel like valuable contributing members of a society of learners.*

Preparing information resources. Learning groups become most productive when they not only make decisions affecting the group but also when they prepare tangible products to share with others. While products can be shared orally, it is even more effective when they are shared in writing as well. Learning groups that are writing to learn rather than “learning to write” are expected to have

something of value to share with others when they finish their work. *Meeting that expectation and publishing what they write makes students feel empowered with knowledge.*

Group assessment. Learning groups should learn to assess their own effectiveness and productivity. When students assume responsibility for doing their work as individuals in a group and as a group, they also assume some responsibility for evaluating the quality of their work. *Being able to evaluate the quality of their own work gives students confidence and a feeling of control over their own destiny.*

Student Power Should Continually Increase

A cooperative learning environment, coupled with a publishing system that provides access to student work for years to come, should result in a continual increase in “student power.” What kind of student power is being promoted? The power that comes with *knowing*. Knowing how to do something, how to formulate a problem and arrive at a solution...*conceptual power and application power.*

Confidence increases with power. The more students learn, the more confident and powerful they become. Confidence increases not only with knowledge, but with the use of knowledge. *Students feel empowered when others use what they have learned and shared.*

Cooperation increases. Cooperation increases when there are meaningful opportunities to learn from each other. Contributions to the learning environment increase when meaningful opportunities to cooperate are provided. *Such cooperation is expected in most of life’s activities.*

Responsibility increases. The levels of responsibility students assume increases when confidence and cooperation increase. When students have more responsibility for their own learning and for the learning of their peers, they feel

more empowered and want to learn more and share more.
Learning more empowers students; is there a limit?

Limit student power? Should there be limits to student power? Not in the sense of wanting the students to learn “only this much.” How should we view student power then? Consider this immediate goal...professors should promote student power to the extent that students rely as much or more on themselves and their peers as they do on their professors for their learning. *The ultimate goal is students who are self-directed life-long learners.*

What if students are so empowered with knowledge that they rely entirely on themselves and their peers, making professors unnecessary? Wonderful! Professors who empower students to that extent have done their job to perfection! *When teachers become unnecessary, the ultimate educational goal has been reached.*

Professorial Power Should Continually Increase

Professorial power should continually increase in a cooperative knowledge-empowering environment because “power” in the sense used here is a multiplying resource. As students assume individual responsibility for their learning and group responsibility for each other's learning, the power of the teacher to promote learning is multiplied.

Multiplying professorial power. Having students work together in a cooperative learning environment reduces the amount of teacher-student contact needed because students help each other. Each student is a teaching assistant responsible for helping other students. *Professorial power multiplies in a cooperative learning environment.*

No barriers to learning. There should be no artificial barriers to learning in a cooperative learning environment. Since information is a resource that does not diminish with

use, knowledge has the potential to continually increase. The only barrier to learning, ideally, should be time. *Professors should never be the limiting factor in their students learning.*

Respect deepens. Professorial power increases when students respect their professors for working closely with them. Deeper contributions to student thinking are possible when working closely with them rather than just lecturing to them and answering their questions. *Mutual respect increases as professors and students combine their mental powers and work together to solve problems.*

Logical and effective organization. Professorial power increases when logical and effective organization is encouraged, when professors guide learning searches, stimulate their students to ask better questions and set up a productive framework for students to work in, learn in, and contribute to others in. *Effective organization of the learning environment promotes meaningfulness in learning.*

Maximize student productivity. Creating a learning environment that motivates students to learn because they want to learn maximizes student productivity. *Publishing the products of their learning in electronic information systems multiplies the value of their work as other students use it.*

Multiplying Professorial Power

Suppose professors accomplish the empowering discussed above. Let's add one more teacher-empowering factor—the power of several professors working together. Let's multiply professorial power by extending cooperative learning to cooperative teaching.

Cooperative teaching, an extension of cooperative learning rather than a new approach to teaching, is justified on the basis of the connectedness of information, concepts,

knowledge, issues, and problems. Teaching subjects and courses in isolation does not make a lot of sense if students are expected to relate what is learned in one subject to other subjects. If teachers do not cooperate in a learning environment that promotes such relationships across subjects, then students must do that on their own. *What kind of miracle is expected of students if professors do not cooperate with each other and relate connected information?*

Cooperative teaching for professors. When several professors cooperate and promote cooperative learning in their courses, their horizons will expand just as student horizons do when working in groups. Cooperative teaching is much more than “team teaching” or taking turns giving lectures, however. Cooperative teaching occurs when several courses are part of a common cooperative learning environment. Cooperative teaching occurs when students in several courses work with several professors on integrating problems. *The courses are seamless, and the subject matter is integrated naturally and automatically.*

Integrating subjects. When several teachers use a cooperative learning approach, integrating subjects is natural. Students share their experiences from other courses and group work is enriched and expanded. Such an approach is described in Moen et al. (1996, 1998). *When an integrated information system is used as the publishing medium, students in any course have access to the material in any subject.*

Seamless courses. Seamless courses represent reality. Behavior and physiology are integrated in biological organisms. Business and law are integrated in society. Economics and resource management cannot be separated. Literature and art go together. Seamless courses give students opportunities to work together on questions that are

A Course Continuum

connected across course lines, accessing whatever information and relationships are appropriate for the problem at hand. In a truly seamless course environment, students enroll in different courses while working together in learning groups in a cooperative learning environment (see Moen et al. 1998 and Chapter 9 in this book). *This unique approach represents a new paradigm in college teaching.*

When several teachers cooperate, when courses are seamless and subjects are integrated...students do not have to shift gears between classes and between semesters. Students move right into new subject matter without having to adjust to different learning environments, and they can focus on integrating knowledge into more meaningful wholes rather than separating knowledge into smaller pieces that, by themselves, are less meaningful.

CONCLUDING REMARKS

When students are given the opportunity to make decisions and work together, the learning opportunities increase dramatically. Not only does this provide important experiences for students in “real-life” situations where it is important for all to work together, it also gives students the opportunity to contribute more directly to their own education. *When students and professors all work together to acquire knowledge, make decisions, and solve problems, everyone is empowered with knowledge, and knowledge is powerful.*