THINKING Classroom

A Journal of Reading, Writing and Critical Reflection

VOLUME 6 NUMBER 4 OCTOBER 2005 ISSN 1392-947X

MISSION STATEMENT

Thinking Classroom serves as an international forum of exchange among teachers, teacher educators, and others interested in promoting democratic teaching practices. The publication encourages professional development, research, and reflection. *Thinking Classroom* features articles that foster learner-centered teaching strategies including critical and creative thinking, active and cooperative learning, and problem solving. The journal also publishes articles about the institutional structures that support these practices.

Founded in 2000 as a publication of the Reading and Writing for Critical Thinking project funded by the Open Society Institute

Published as a quarterly journal from 2002 by the International Reading Association

International Reading Association
800 Barksdale Road, PO Box 8139
Newark, DE 19714-8139 USA

Production by **Garnelis**,
Klaipėdos g. 6, 01117 Vilnius, Lithuania

ABOUT THE INTERNATIONAL READING ASSOCIATION

The International Reading Association is a nonprofit service organization dedicated to improving reading instruction and promoting the lifetime reading habit. The Association publishes professional books and five professional print journals: *The Reading Teacher* (about learners ages 1–12), the *Journal of Adolescent & Adult Literacy, Reading Research Quarterly, Lectura y Vida* (in Spanish), and *Thinking Classroom* (also published in Russian as *Peremena*). The Association also publishes a bimonthly newspaper for members, *Reading Today.*

THINKING Classroom

A Journal of Reading, Writing and Critical Reflection

Printed by **Vilniaus spauda** UAB,
Viršuliškių skg. 80, 05131 Vilnius, Lithuania

Departments

Features

Letter from the Editors

Despite much talk about our living in a *global village*, too little is made of what it means to be global neighbors. Does what we say to one another make sense? Who dominates the conversation, perhaps without even trying? In what language(s) do we communicate? And what is the cost of such communication, both psychological and financial?

In 1997, with support from the Open Society Institute (OSI), a group of International Reading Association (IRA) volunteers ventured into Central and Eastern Europe, the Balkans, and the former Soviet states to teach and learn from teachers there. Our goal was to promote critical thinking and active learning in our global village. In order to feed the academic fire begun through these workshops, a journal, available in both English and Russian (and translated into Romanian, Lithuanian, Bulgarian, and Azeri, among other languages) was begun. It was a pretty good journal, but it had no formal distribution network and basically no readership outside of the Reading and Writing for Critical Thinking (RWCT) project.

Four years ago the IRA Board voted to include *Thinking Classroom/Peremena* (*TC/P*) in its stable of journals and spent considerable money and time advertising its existence and broadening its content base. As a result, we now have more than 4,000 subscribers, a pipeline of articles, and a truly professionalized publication infrastructure, including a peer-review process. As editors, reviewers, authors, and readers, we have learned a great deal from one another.

Though *TC/P* has found a broad readership in the United States, we on the editorial team still long to address our original mission—to foster a worldwide conversation among people who care about helping students become independent thinkers and learners. This will be the goal of the RWCT International Consortium, a group centered outside of the United States who will take responsibility for the publication. Their goal—our goal—is to make *TC/P* more than a publication of a project or an association or a consortium.

With that in mind, and with support from the OSI, *TC/P* plans to develop an independent presence and an even wider reach. But we cannot do this without the ongoing support of our current readers.

We ask, if you share our goal of fostering a conversation about progressive education among people living in different parts of the world, that you go to www.rwct.net and subscribe to either *Thinking Classroom* or *Peremena* immediately. And if you are able, please ask your library and friends to join us in this venture.

At present we live in a world where distrust flourishes and stereotypes abound. Please do your part in helping to break down the barriers that keep those of us who care about children from talking directly to one another. Send in articles that describe your practices, your ideas, and your questions. Volunteer to peer review articles. And do, please, remember to subscribe to either the online or paper version of the publication.

Thus, we hope this is not "farewell," but rather "see you soon!"

Wendy Saul

Daiva Penkauskiene

Olga Varshaver

Look Who's Talking

THE QUESTION: We are all aware that both children and adults today are better at using a computer keyboard than writing by hand. Are handwriting skills still worth developing? Does typing rather than writing by hand affect one's ability to write thoughtfully?

Milena Issaeva,

Bulgarian language and literature teacher in the Foreign Languages School "Simeon Radev," Pernik, Bulgaria

"The spirit creates the hand, and the hand creates the spirit…. When I sit down and start writing I always glance at my hands as they invitingly inspire my spirit. There they are—my two faithful and tireless companions that have been working so hard for so many years—the one holding the paper and the other filling the white sheet with hurried dark and vigorous symbols. The hands help us touch the body of our thinking. They process the block, shape it and outline it and style it through the handwriting" (Henri Focillon, Life of Forms in Art, *1934/1989). The choice of handwriting determines the writer's freedom even if such freedom lasts only for a moment. But that moment is related to the uniqueness of man, to the history of the individual and his most intimate inner life. Thus the handwriting becomes a constituent part of one's identity, a bridge toward self-knowledge and the visiting card that one gives to others; it expresses one's innermost ego and compares with nothing else.*

It is not possible to transfer the information that is stored in one's handwriting and that influences one's thinking and style into a computer-written letter that is standardized, impersonal, and lacks the calligraphic beauty that delights the senses, pleases the mind, and brings a handwritten letter nearer to art. In spite of this, just as book publishing brings the creations of the spirit to a wide audience, the computer-written letter makes our ideas accessible, turning them into unknown birds scattered in the infinite Internet space.

Let's preserve and treasure our handwriting as a eulogy for the hand and the spirit!

Olga Meyer,

Teacher of Russian as a first language, Moscow, Russia

I believe it is important to develop handwriting skills in small children. While acquiring overall literacy skills, a child activates different memory mechanisms, "hand memory" among them. The movement of the finger pressing the "a" key does not differ from the movement needed for pressing the "o" key. However, we know that in reality the choice of appropriate letters in terms of spelling is quite hard in many languages. The two letters signify different things in the language, and it is important that a child not only is aware of this difference but also starts to "feel" it. When a child is writing letters and words, with the tongue between the teeth for better concentration, he or she lets different signs pass through the mind and the fingers, whereas the movements for pressing different keys on a keyboard are all alike. That's why the slow writing out of u, e, i and double l in the word bulletin will yield fruit in the semiotics garden.

For several years I gave lessons to a boy who had problems with fine motor coordination. He started to learn to write when he had already been a good and avid reader for quite a while. Each letter was a problem for us. But after he sweated hard over each word, he remembered it forever. Later he practically had no spelling problems at all, and the choice between "a" and "o" proved easy for him. However, working with the keyboard also develops fine motor skills, with the most evident advantage being the ability to see the word on the monitor immediately. Visual memory works much better for printed than for handwritten words. So, I believe, these two activities (typing and handwriting) make good supplements to each other in the early literacy process. As for creating text (such as essays and compositions), I am sure all this should be done on the computer, so that the student of any age is able to see his or her text as a whole, to "step aside from it," and to revise it properly.

Nancy Patterson,

Literacy Studies Program Chair, College of Education, Grand Valley State University, Allendale, Michigan, USA

I appreciate the fact that we are discussing the role that computers play in improving student writing, but think there might be a better way to pose the question. We are, after all, not asking teachers to stop teaching students to create text with paper and pencil or pen. And we are not dismissing the fact that small children might have difficulty with a keyboard because of the size of their fingers (although I've seen some pretty swift 5-year-olds on a keyboard).

Computers and new ideas about the processes that people go through to create text have come along at about the same time. That is probably not an accident. Janet Emig's research in the early 1970s and that of Don Graves and Don Murray shortly thereafter looked at the composing stages that people go through when writing. These stages have always been recursive, not linear. That concept is actually at least 2000 years old. The printing press represented a radical shift in how we thought about text and writing. Print text appeared to be more linear than manuscript text, and so we defined the process of creating print text in a more linear way. The computer has challenged us to reconsider.

Rather than ask a question that will create a binary (paper and pencil good, computers bad; or computers good, paper and pencil bad) why not ask "How have computers changed the way your students write?" The change, actually, is profound. Much research indicates that children write better and longer pieces when they can compose at a keyboard. They revise more readily, and they seem to be far more engaged in their emerging texts. Computers allow them to move fluidly among the various stages of writing. Students write more, they write more "correctly," and they write better pieces, often because it is easier to revise.

Few mourn the fact that people don't carve into damp clay tablets anymore, or that they don't use quills rather than pencils or pens. We will still teach children to write by hand because there is still a need for it. But we can embrace both technologies, ever mindful, of course, that the research on computers and writing is significant. Computers and the Internet reflect a profound change in how we view text and in the role that readers take when they read electronic text. The inclusion of a hyperlink in a webpage represents a dramatic shift from the expectation of linearity. Our children need to be able to read and write electronic texts, and they need to know how to write by hand. There is yet a place for both.

Aida Valotkaitė,

Primary school teacher at S. Daukantas secondary school, Vilnius, Lithuania, and student at Vilnius Pedagogical University

Today the computer, without any doubt, has influenced the world of adults as well of children. The media report that children are spending more and more time every day playing computer games or chatting at websites. This means that time spent staring at computer screens can become a real problem, as children have less time for reading and doing homework. Results of a psychological survey in Lithuania show that children who use computers become more sensitive and irritable and can have communication problems. On the other hand, it is said that good computer games can develop thinking and quick reaction. Lithuanian educators have noticed that pupils more often use jargon as a consequence of using e-mail, often omitting some Lithuanian letters, signs, and words from their other writing. We have noticed that frequent computer use has an impact on the richness of the speech and language use of pupils who spend less time reading books. It is certainly important for students to have computer writing skills, but these need to be directed more toward critical analysis and recollection of information.

Mark K. Felton

Approaches to argument in critical thinking instruction

Debating, questioning, analyzing, searching for evidence—all of these skills have been attributed to the label *critical thinking*. But what exactly do these skills have in common, and how do we go about teaching them? All of these practices draw on both general knowledge about the structure of argument and specific knowledge about the topic at hand. They combine the skills of justification, use of evidence, and critical questioning. And they all require the dispositions of skepticism, inquiry, and impartial judgment. Teaching this constellation of knowledge, skills, and dispositions requires a methodical and cumulative approach that seems daunting in light of the resources and methods currently available to educators. But there are many complex skills in the school curriculum that take years of instruction for mastery—reading comprehension, expository writing, and mathematical problem solving, to name a few. And while we might debate our success in teaching such skills in high school, no one doubts that they can and should be taught.

The challenge for critical thinking instruction lies not in convincing people of its value but in developing a model of what to teach and how to teach it. The absence of such a model is obvious when we look at examples of typical lessons. All too often critical thinking is taught in isolated language arts or social studies lessons that fail to connect to the larger curriculum. In such lessons students may learn about persuasive messages, argument fallacies, or even problem-solving skills. But these lessons generally occur with little or no reference to the course content, and they are rarely reinforced in subsequent lessons. As a result teachers find them ineffective and frustrating distractions from the curriculum. The problem is that these lessons are add-ons to the curriculum. If we are to treat critical thinking as the complex skill set that it is, it must be embedded in the curriculum and connected to a comprehensive set of goals and outcomes.

One sensible strategy for developing a model for critical thinking instruction is to explore advances made in the field of argumentation. While there are dozens of ways to define critical thinking, most definitions include the ability to examine claims, conclusions, and assumptions. And while critical thinking may include much more, we can say with certainty that it at least involves engaging in a process of critically questioning arguments. Therefore, to build a model of critical thinking instruction we might begin with our understanding of the simplest unit of analysis—the argument. What we find is that argumentation theory itself has undergone significant changes in the past 50 years. And while many of these theoretical developments have found their way into critical thinking lessons, the aim here is to present a list of recommendations for high school teachers interested in revising their approach to critical thinking instruction.

Recommendation 1:
Focus instruction on informal, or inconclusive, arguments

All too often teachers looking for lessons on critical thinking turn to formal logic for content. The allure is clear—formal logic offers a means of distin-

guishing conclusive from inconclusive arguments, allowing students to judge whether the conclusion of an argument is certain. Until recently, formal logic was the most common framework for developing critical thinking instruction.

High school lessons in formal logic generally begin with syllogisms like the following: "All of Mary's brothers have freckles [major premise]. John is Mary's brother [minor premise]. Therefore John has freckles [conclusion]." By its very design the syllogism is conclusive, and we can be certain that the conclusion is true if the major and minor premises are true. In formal logic all valid arguments appeal to a finite number of relationships that can be drawn among a set of propositions. Arguments that fall outside of this finite set are said to be informal and invalid because they do not establish an indisputable conclusion. The assumption has been that teaching students formal logic helps them develop a critical stance toward inconclusive arguments.

Unfortunately, while some arguments are designed to prove a point conclusively, most are meant only to support a point. In our daily experience, demonstrating the indisputable truth of a claim represents only a fraction of our thinking about arguments. Most of our everyday reasoning operates under conditions of uncertainty—we argue for one policy over another, consider the likelihood of a predicted outcome, or weigh the merits of a plan of action. In such cases our lives demand that we draw conclusions, make decisions, and take action based on the strength of what are known as informal arguments. This environment offers very few opportunities for the conclusive proofs typically found in formal logic.

Teaching students to examine the quality of arguments when no clear conclusion is available is far more useful in the high school curriculum. Fulkerson (1996) made the compelling argument that most of what students read and write in high school is a form of informal argument. He suggested that all three of the major categories of writing—narrative, expository, and persuasive—involve marshalling evidence in support of claims. When reading a piece of fiction, students make inferences about characters based on the narrative details provided by the author. In history class, students read interpretations of events that are substantiated with artifacts, narratives, and documents. In current events class, students cite statistics, historical precedents, and expert opinions to argue for or against a policy. Whether they are writing a piece of literary analysis, reading a historical account, or debating policy, students are asked to consider the relative merits of claims based on the arguments used to support them. In each of these cases, the arguments presented will be far from conclusive; they will be open to a form of discourse that is at the heart of critical thinking. Therefore while instruction in formal logic can be an effective introduction to argument, it is even more important to make room for instruction in informal argument.

Recommendation 2:
Encourage students to examine informal arguments rather than dismiss them as inconclusive or laden with assumptions

A second common approach to critical thinking involves teaching logical fallacies. Logical fallacies represent a list of rhetorical devices that rely upon unstated assumptions to support claims. These assumptions, taken alone without further justification, are judged by most people to be unacceptable. For example, in a typical lesson on logical fallacies, we are taught to reject arguments that rely on an "appeal to authority." This device entails justifying a conclusion by saying that an authority agrees with the position that is advanced. Obviously, without the authority's reasons for agreeing with the position, the appeal does not provide acceptable justification for the conclusion. Students are told that if they learn to identify and dismiss logical fallacies in the arguments they read and hear, they will become better critical thinkers. However, while there are advantages to identifying logical fallacies, this approach to critical thinking instruction also has its shortcomings.

First, instruction in fallacies generally involves looking at arguments devoid of content or removed from context. We give students a list of terms such as "appeal to authority" or "slippery slope" with examples of each. But students are not asked to explore the weaknesses of such arguments in context and, unfortunately, teaching argumentation out

of context fails to support the transfer of critical thinking skills (Halpern, 1998). To be successful, students must learn about argument in context and with ample opportunities to practice their skills with authentic controversies—arguments where they have a strong opinion and sufficient content knowledge to support it (Stein & Miller, 1991).

Second, and more important, many sound arguments can be built from the same foundation as logical fallacies (Walton, 1996). For example, drawing the line between a fallacious appeal to authority and an acceptable use of expert opinion can be tricky. The distinction lies in judging the merit of the justification the authority provides. When four out of five dentists choose a brand of toothpaste, what is their reason? The real work of argumentation lies in eliciting and examining the merit of those reasons. Unfortunately, teachers using the "fallacies" approach often focus on dismissing arguments rather than testing them—students learn to "see through" common weak arguments and reject them as intellectually disingenuous. But this approach to critical thinking only provides reasons to doubt an argument without offering a standard or process by which to evaluate it.

Genuine critical thinking involves testing the strength of informal arguments by examining the claims used to support them. To accomplish this goal, teachers must start a unit on critical thinking by providing students with a framework and vocabulary for describing the parts of a complete informal argument. Once students understand the structure of a complete argument, they can then learn to look for incomplete arguments and evaluate their unstated assumptions.

Recommendation 3:
Provide a vocabulary for describing and evaluating informal arguments

The most widely adopted model of informal argument, developed by Stephen Toulmin (1958), provides an ideal vocabulary for students to use in thinking and talking about arguments. Toulmin recognized that many of the natural language arguments that we generate are not valid according to formal logic, yet they still present reasonable justifications. He argued that many of these arguments draw on principles of inference that are acceptable within their specific domains. While the conclusions in informal argument are invalid in a formal sense, they are based on rational and persuasive argumentation.

According to Toulmin, arguments are composed of four basic parts: claims, data, warrants, and backing (see Figure 1). Every sound argument presents a claim supported by data. The claim

Figure 1 **Toulmin's elements of argument**

Claim. A claim is a statement that you want others to accept. Inferences and interpretations, conclusions, opinions, and proposals can all be examples of claims.

Data. Data are the evidence used to substantiate a claim. This evidence may or may not be indisputable, therefore part of critical dialogue may center on challenging the truth or interpretation of the data used to support a claim.

Warrant. A warrant links data to a claim. It is an explanation of how the data cited in an argument support the claim. Because that link is often self-evident, warrants are often left unstated in an argument. However, in critical dialogue someone might accept your evidence as true but challenge the relevance of that evidence to your claim. You would then need to supply an acceptable warrant.

Backing. Backing is the justification used to validate the warrant. It is an explanation of the grounds or authority upon which a warrant is based.

Qualifier. Qualifiers establish the strength of a claim or the conditions under which a claim is valid. Qualifiers often emerge in critical dialogue as you discover the limits of your position.

Rebuttal. All informal arguments are open to counterargument since, by definition, they are inconclusive. Rebuttals are responses to counterarguments levied against your claim. Again, rebuttals often emerge in critical dialogue as you answer opponents' challenges to your claims.

is a conclusion that the speaker wants to draw, and the data are evidence used to support that conclusion. The warrant is an implicit or explicit argument that specifies the relationship between the data and the conclusion. Of course, within a field of study there must be a rationale for the warrants used. Therefore, an acceptable warrant must be supported, implicitly or explicitly, by backing. Backing provides justification, specific to the field of study, for the warrant.

Taken together, these four components produce a reasonable informal argument. Consider the following example: "John is sick [claim]. He has a temperature of 103° F [data]." Here the speaker makes a claim and presents data to support it. In natural language contexts this is a reasonable argument, and under most circumstances the speaker would not need to argue the point further. However, if someone were to challenge the inference, the speaker could provide a warrant by adding, "In most cases, anyone with a temperature of 103° F is said to be sick [warrant]." In the terminology of formal logic, the warrant provides the missing premise in the speaker's original argument. Of course, the warrant may go unstated, and the speaker may instead provide the backing for her warrant. She might say, "A body temperature above 102° F indicates the presence of bacterial infection [backing]." The backing provides a justification for the inference that is acceptable in the field of medicine. Although this argument is still not conclusive in a formal sense, most audiences would find it acceptable.

In addition to the four basic components, Toulmin adds two more elements: the qualifier and the rebuttal, which can be added to an argument in order to address an anticipated critique. For instance, someone might argue that John's fever is due to overexposure to the sun, not to an illness. The speaker might respond with a qualifier and rebuttal: "Unless he's suffering from heat stroke [qualifier/rebuttal], John is sick [claim]; he has a temperature of 103° F [data]." This modal addition to the argument allows the speaker to specify the conditions under which she wishes to advance her argument. It is important to note that the original argument (comprising a conclusion supported by a warrant) is acceptable, so long as the missing components can be supplied. Depending on the audience and the context for the argument, a simple unelaborated argument may suffice. A speaker or writer may choose to add the other elements based on the context of the claim and its intended audience.

The difference between Toulmin's model of argument and those found in formal logic is that Toulmin acknowledges the inconclusive and structurally incomplete nature of everyday argument. According to Grice's *maxim of economy* (1975), a speaker will only provide as much argument as is necessary to satisfy his or her audience. In other words, we often leave elements of arguments implicit unless we believe our audience will disagree with us. In fact, over-arguing a point is often judged as cause for suspicion. Therefore, it is inappropriate to dismiss an argument for being incomplete, because a speaker or author may be choosing to keep his or her justification implicit. Toulmin's model of argument captures this relationship between an incomplete argument and its tacit structure. It suggests that while many arguments start off incomplete, they can be made complete by adding missing components (Henle, 1962; Walton, 1996). In this way, Toulmin introduces the idea that examining an argument involves looking for components that are necessary to flesh out—or elaborate—an informal argument.

There are two advantages to Toulmin's approach for critical thinking instruction. First, the framework gives students a standard for evaluating whether an informal argument has justified a conclusion. His notions of warrant and backing capture elements of argument that support a claim without proving it conclusively. They illustrate how justifications that have no place in a formal proof can be coordinated to increase the strength of a claim. In other words, the model allows students to focus on the persuasive, rather than conclusive, strength of an argument. This shift in focus makes Toulmin's model more applicable to critical thinking and real-world argument than traditional lessons on logic and fallacy.

Second, Toulmin's framework can be used to introduce students to two-sided thinking in informal argument. Because informal arguments only justify claims,

rather than prove them, it is crucial that they address the questions and objections that might arise in the minds of a reasonable audience. In Toulmin's model, elements such as qualification and rebuttal are fundamental to justifying a claim in light of opposing viewpoints. To produce these elements, students must understand that informal argument cannot be complete without considering alternative perspectives.

Taken together, Toulmin's two innovations have important implications for how we understand critical thinking. First, arguments can be incomplete yet valid. This means that critiquing arguments involves going beyond what is written or said to determine what is missing. Second, argument is constructed in light of an audience. The types of acceptable warrants, backing, qualifications, and rebuttal depend on the demands of the audience.

The implications for critical thinking instruction are clear. We should introduce students to the structure of argument and provide them with Toulmin's vocabulary to discuss the arguments that they encounter in the curriculum. Using Toulmin's model we can teach students to engage in a critical process that centers on exploring and critiquing the missing elements of an argument. Rather than reject arguments as incomplete, students can then learn to look for data or warrants that would support unelaborated claims. They can also learn to look for qualifiers and rebuttals that might strengthen an argument in light of alternative perspectives. And in teaching students to recognize incomplete arguments, we should also teach them how to determine what would be necessary to elaborate such arguments—giving them the opportunity to develop their own justifications, counterarguments, qualifiers, and rebuttals. In so doing, we give them both a vocabulary for talking about sound argument and an opportunity to learn to construct arguments of their own.

But Toulmin's model is not, in itself, a framework for critical thinking instruction. It provides a vocabulary for describing informal argument without providing a prescriptive process or pedagogical approach. Certainly we can use the model to teach students to recognize missing elements in arguments. But we must also teach students to engage in the process of probing and elaborating informal arguments. Students will not learn to put their knowledge of argument structure to use unless we provide explicit scaffolding and instruction around the process of engaging in argumentation (Halpern, 1998). Ultimately a comprehensive approach to critical thinking instruction must cover both the structure of argument and the process of argumentation.

Recommendation 4:
Give students the opportunity to engage in argumentation

Critical thinking can be understood in many ways as a form of internalized critical dialogue. When we ask students to engage in critical thinking, we ask them to engage in a process of critical questioning that closely resembles a conversation (Billig, 1996; Walton, 1989). This "dialogue" may occur verbally in debates between individuals or silently in private deliberation. In either case, critical thinking involves the methodical process of probing and elaborating arguments by searching for justifications, critiquing claims, and rebutting critiques. For students to become proficient critical thinkers, teachers must help them grasp not only the structure of informal argument but also the process of argumentation.

Toulmin's model of argument has been criticized for not going far enough in capturing the dialogic process used to build an argument (Eemeren, Grootendorst & Kruiger, 1987). Granted, the model allows us to look at an argument in various stages of completion—we can see how a speaker adds a warrant or backing to an argument in response to a challenge—but it lacks a vocabulary for describing the questions and comments that may prompt a speaker to elaborate an argument.

An alternative approach emphasizes the social interaction that produces an argument. As we have seen, many of the argument fallacies identified by logicians are, in fact, acceptable in conversation. The best response to an incomplete argument is to test its strength in a process of dialogue. According to Walton (1996), most informal arguments are "tentative and inconclusive—open to critical questioning—while still being strong enough…in transferring acceptance from

Photo: PhotoDisc, Inc.

the premises to the conclusion" (p. 5). Walton described informal arguments as "presumptive" because they are provisional in nature. Presumptive arguments often advance the claim "if we accept premise x, then we can conclude y." Thus, presumptive arguments are tentative and require a warrant to justify their acceptance. This much is accounted for in Toulmin's model of argument, but Walton has added an important dialogic component.

Rather than accept or reject presumptive arguments as invalid (as logicians might), or simply identify the missing components (as Toulmin might), we should probe them to test whether the missing components are available to be added. The goal of probing presumptive arguments is to determine whether they should be accepted as common ground in argumentation. An audience will accept a conclusion only if all of the presumptive arguments have been granted. If it can be shown that an argument does not withstand critical scrutiny, then it can be dismissed.

Teachers should encourage students to engage in a conversation with incomplete or presumptive arguments, asking questions like "Am I really willing to accept this case?" "Are there other interpretations of the evidence presented?" or "Who is the source of this information?" Questions such as these serve as points of entry for argumentation. Students engaged in this kind of critical discourse must then elaborate the presumptive arguments and test their strength. Of course, critical discourse cannot be scripted. Each sequence of questions put to a presumptive argument will depend on the specific topic being discussed, the background knowledge of the students, and the answers that emerge in the course of dialogue. However, teachers can scaffold the questioning process by initiating lines of questioning or prompting students to do so.

Fortunately, research in argumentation has shown that by early adolescence, students already possess a host of critical questioning strategies (Felton & Kuhn, 2001; Resnick, Salmon, Zeitz, Wathen, & Holowchak, 1993). In the context of dialogue and debate, young adolescents naturally produce Toulmin's elements of argument, including claims, counterarguments, and even rebuttals (Felton & Kuhn, 2001). Thus they know how to prompt, challenge, and probe arguments at least in the supportive context of conversation.

This model of argumentation holds two important implications for critical thinking instruction. First, students learn to think critically by engaging in critical discourse. We assess the integrity of an argument by asking and answering questions about that argument. And to

become proficient in critical thinking, students must learn to give voice to both sides of an argument. Therefore, teachers should give students the opportunity to engage in thoughtful discussions and debates that explore the strengths and weaknesses of presumptive arguments. Teachers should plan class discussions in which students are prompted to take a stand, question arguments and interpretations, or challenge assumptions. Making this kind of discourse a natural part of classroom conversation provides a means for embedding critical thinking throughout the curriculum.

Second, in addition to knowledge and skills, students need dispositions to engage in effective argumentation. If students are to use discourse to test arguments, they must be willing to listen to and entertain alternative perspectives. This challenge becomes even greater when they must internalize the dialogue and apply critical thinking to their own deliberation. When students learn critical thinking in the context of debate, teachers can help them learn to suspend judgment in order to adequately explore the integrity of an argument. Then students must voice both sides of an argument as faithfully as they can before drawing a conclusion.

Recommendation 5:
Encourage students to reflect on their argumentation

Research suggests that in the supportive context of dialogue, students produce more advanced structures of argument together than they do alone (Felton, 2004; Pontecorvo & Girardet, 1993; Resnick et al., 1993). Therefore, practice in critical dialogue is a natural gateway to teaching students about the structure of process of argument. But practice alone is not sufficient for increasing students' skills of argument. Unfortunately, outside of the highly supportive context of dialogue, adolescents question and elaborate arguments only inconsistently. At least in the short run, as students practice arguing a particular topic, they may show improvements in their ability to argue that topic, but they do not transfer those improvements to new topics (Felton, 2004).

As with most forms of higher order thinking, critical thinking must be taught in a way that facilitates transfer, or it will remain context bound (Halpern, 1998). In order to support broad, transferable advances in argumentation, teachers need to focus students' attention on the structure of the arguments they produce to see beyond a given issue or topic to the structure of elaborated argument (Halpern, 1998). This combination of dialogue plus reflection produces advances that can transfer to new topics (Felton, 2004) and even to new contexts, including expository and persuasive writing (Felton & Herko, 2004; Yeh, 1998). In Vygotsky's (1978) terms, the process of reflection helps to usher students from the level of *assisted performance* in critical dialogue to *independent performance* in critical thinking. When students reflect on their own dialogues, they begin to appreciate how missing elements in argument can leave claims open to critique, and they begin to see how the process of argumentation can be used to temper and sharpen an argument. This combination of firsthand experience in dialogue and critical reflection sets the stage for the transfer of skills to new contexts.

Thus, in addition to making room for debate and critical discourse in the classroom, teachers should reserve time for reflection. Students need the time and space to think about what makes good argument. For example, a teacher might move from whole-group critical discourse to a pair-share debrief or journal-writing exercise in which students refer to a list of Toulmin's terminology to guide their appraisal of the discussion. Or, a teacher might organize a "fishbowl" conversation in which a small group of students engage in a debate while their peers sit in a circle around them and listen. After the debate, students in the outer circle can debrief the experience, focusing on the elements of argument addressed in the smaller group's conversation. A writing teacher might have students edit their own or their peers' writing, focusing primarily on the presence and strength of argument elements. In each of these activities, the goal is to provide students the opportunity to reflect on a meaningful argument that they themselves (or their peers) have just produced. This combination of argumentation and reflection opens the door to internalizing the skills and dispositions of critical thinking.

Toward a comprehensive model of critical thinking instruction

To become critical thinkers, students must learn to engage in critical discourse with the arguments they encounter in the world around them. Our first duty as educators is to help students see that opportunities to engage in critical discourse abound. We must encourage them to question and challenge their texts, their teachers, their peers, and themselves. In so doing, we help students grasp the purpose of critical thinking: to examine the foundations upon which knowledge, information, and opinions are built. But engaging in critical discourse requires more than a list of fallacies; students need a framework for evaluating arguments. Toulmin's model provides a useful framework for students to examine the ability of an argument to justify rather than prove a point.

Once students have developed a framework for examining arguments, they must then practice questioning and elaborating claims throughout the year. Argumentation must become a routine part of classroom discourse throughout the curriculum or it will not become a routine part of students' thinking. It is for this reason that critical thinking cannot be taught in a single lesson or short unit. It develops over time through practice and reflection. A short series of lessons that introduce students to the structure of argument represents an excellent point of entry to an effective curriculum, but it cannot supplant real experience in argumentation and critical discourse. To take root, critical thinking must become part of the very fabric of instruction. Every thesis in a composition class, every decision in history, every conclusion in science is an opportunity to engage in argument and explore the principles of effective argument. Once we teach students about these principles of argument, they can sharpen their skills whenever we ask them to read, write, or discuss their ideas in class. In this way, critical thinking is no longer an add-on to the curriculum but the very means by which students construct knowledge.

References

Billig, M. (1996). *Arguing and thinking: A rhetorical approach to social psychology* (2nd ed.). New York: Cambridge University Press.

Felton, M. (2004). The development of discourse strategy in adolescent argumentation. *Cognitive Development, 19*(1), 39–58.

Felton, M., & Herko, S. (2004). From dialogue to two-sided argument: Scaffolding adolescents' persuasive writing. *Journal of Adolescent & Adult Literacy, 47*, 672–683.

Felton, M., & Kuhn, D. (2001). The development of argumentative discourse skills. *Discourse Processes*, 29(2&3), 135–153.

Fulkerson, R. (1996). *Teaching the argument in writing.* Urbana, IL: National Council of Teachers of English.

Grice, H.P. (1975). Logic and conversation. In P. Cole & J.L. Morgan (Eds.), *Syntax and semantics, Volume 3: Speech acts* (pp. 41–58). New York: Academic Press.

Halpern, D.F. (1998). Teaching critical thinking for transfer across domains. *American Psychologist, 53*, 449–455.

Henle, M. (1962). On the relation between logic and thinking. *Psychological Review, 69,* 366–378.

Pontecorvo, C., & Girardet, H. (1993). Arguing and reasoning in understanding historical topics. *Cognition and Instruction, 11*, 365–395.

Resnick, L.B., Salmon, M., Zeitz, C.M., Wathen, S.H., & Holowchak, M. (1993). Reasoning in conversation. *Cognition and Instruction, 11*, 347–364.

Stein, N.L., & Miller, C.A. (1991). I win—you lose: The development of argumentative thinking. In J.F. Voss, D.N. Perkins, & J.W. Segal (Eds.) *Informal reasoning and education* (pp. 265–290). Hillsdale, NJ: Erlbaum.

Toulmin, S. (1958). *The uses of argument*. New York: Cambridge University Press.

van Eemeren, F.H., Grootendorst, R., & Kruiger, T. (1987). *Handbook of argumentation theory: A critical survey of classical backgrounds and modern studies*. Providence, RE: Foris.

Vygotsky, L.S. (1978). *Mind in society: The development of higher mental processes.* Cambridge, MA: Harvard University Press.

Walton, D.N. (1989). Dialogue theory for critical thinking. *Argumentation, 3,* 169–184.

Walton, D.N. (1996). *Argumentation schemes for presumptive reasoning.* Mahwah, NJ: Erlbaum.

Yeh, S. (1998). Empowering education: Teaching argumentative writing to cultural minority middle school students. *Research in the Teaching of English, 33(1)*, 49–83.

Mark K. Felton teaches in the College of Education, San Jose State University, San Jose, California, USA. E-mail mfelton2@yahoo.com.

Foong Pui Yee

Developing creativity in the Singapore primary mathematics classroom:

Factors that support and inhibit

The Third International Mathematics and Science Study (TIMSS) put Singapore on the world map when the achievement of its pupils in mathematics exceeded that of competitors from more than 40 countries. The mathematics curriculum in Singapore schools can be said to be traditional, with strong emphasis on content that has well-defined inner structures. To challenge pupils' analytical skills, numerous complex multiple-step problems are normally given. Pupils are trained to classify problems into types and tackle them according to some specific methods. These aspects of mathematical learning in developing basic concepts, skills, and problem solving have been very successful in the Singapore curriculum. The TIMSS mathematics achievement data released in 1996 and 1997 ranked the performance of Singapore pupils at ages 13 and 9, respectively, in the top place. The fact that the TIMSS items largely matched what we were teaching in Singapore schools was, of course, an advantage.

As to the teaching methods in our mathematics classrooms, the prevalent practices are whole-class teaching, textbooks, and regular testing (Chang, Kaur, Koay, & Lee, 2001). Pupils do a lot of practice sums, mostly of the one-method and one-answer kind, to consolidate and reinforce the mathematics concepts or procedures taught by the teacher through an expository method. A growing concern within mathematics education is that teaching methods that focus on standard textbook questions and solving problems through drilling encourage only the development of procedural knowledge. Desirable learning outcomes such as meaningful conceptual understanding and critical and creative thinking in problem solving, as well as giving students' ownership in their learning, cannot be brought about through such product-oriented methods. Supporters of process-based curriculum are now arguing for creativity in the mathematics classrooms through more open-ended, practical, and investigative tasks to supplement textbook questions upon which teachers have depended. Students can benefit in many ways while working on open-ended tasks, which would require them to make their own decisions and plan strategies as well as apply their mathematical knowledge. In this article I will share the experiences of three primary teachers who tried open-ended questions with their pupils, and I will elicit from these experiences the classroom-based factors that could support or inhibit creativity in the pupils' work.

Creativity and open-ended questions

What does it mean to have creativity in the mathematics classroom? The answer to this question will depend on one's view of the nature of mathematics. To many people, creativity is not usually associated with the traditional image of school mathematics, which is often seen as static structured systems of facts, procedures, and concepts. This portrayal of school mathematics has led to lessons in which students tediously learn a collection of techniques by following predetermined rules. However, there is an increasingly accepted view that mathematics is an exciting and dynamic science (de Lange, 1993), which focuses on the active generative processes engaged in by the learners.

One cannot count on the standard mathematical textbook questions used by teachers to support this new view of mathematics education. Pupils must encounter rich mathematical problems about which they can reason, offer evidence for their thinking, communicate, and present their ideas and find connections across mathematics as well as in real life. Foong (2002) has advocated the use of short open-ended questions that teachers can convert from their textbook sums to engage pupils in higher level thinking and creativity. Take, for example, a standard closed textbook question:

> There are 12 oranges to put into 3 bowls. Each bowl must have the same number of oranges. How many oranges are there in each bowl?

By leaving out an element, we can transform this question into an open-ended problem with higher level cognitive demands:

> There are 12 oranges to be put into bowls. Each bowl must contain the same number of oranges. Show how you could put the oranges into bowls.

The cognitive demands of the open task include the following:

- Pupils make their own assumptions about the missing data: the number of bowls.
- Pupils access relevant knowledge, including multiplication, division, fraction, and factors.
- Pupils must display number sense and equal grouping patterns to solve the problem.
- Pupils need to use the strategy of systematic listing.
- Pupils communicate their reasoning through multiple modes of representation.
- Pupils display creativity in several possible strategies and solutions.

The characteristic features of such open-ended questions are that they can have several possible answers and can be solved in different ways. The questions should offer pupils room for their own decision making and a natural mathematical way of thinking. There are three categories of open-ended questions that teachers can create from textbook sums:

- Problems with missing data or hidden assumptions.
- Problems that explain a concept, procedure, or error.
- Problem posing.

For the purpose of this article, we will not discuss the construction of such problems (see Foong, 2004). Many teachers who attended my workshop on using open-ended questions tried such questions on their own pupils. Initially many of them were apprehensive about giving their students such tasks, as it had never been part of their teaching to require pupils to give explanations and reasons for their solutions. Neither were they used to giving pupils more room and time for group discussions in mathematical problem solving. The practice had always been to give students problems that had only one answer and to teach only one method of finding it, mostly as individual work. After the teachers tried open-ended questions with their students, many of them were surprised by the rich responses of most of their students. Of course, there were also reports by some teachers that their pupils did not engage in the tasks as intended and were not able to show their reasoning and communication skills. In the following section we will discuss classroom-based factors that support or inhibit thinking and creativity when teachers attempt to use open-ended tasks.

Classroom-based factors that support and inhibit thinking and creativity

Research has shown that the mere presence of high-level tasks in the classroom will not automatically result in pupils' engagement in higher order thinking. The same can be said of open-ended questions that are intended to develop critical and creative thinking. Henningsen and Stein (1997) suggested that although attention to the nature of mathematical instructional tasks is important, attention to the classroom processes surrounding the tasks is equally important. One must create an environment that balances classroom management needs with academic demands. Henningsen and Stein found that high-level tasks were more susceptible to various factors that could cause a decline in pupils' engagement. High-level tasks, such as open-ended problems, involve more ambiguity and a higher level of personal risks for pupils than they are normally exposed to in routine problems.

A very important phase in carrying out open-ended high-level tasks in the classroom is the **set-up** phase, during which the teacher announces the task in such a way as to encourage pupils to use more than one strategy, use multiple representations, and supply explanations and justifications. During the **implementation phase**, in order to sustain pupils' high level of engagement in the task the teacher must be willing to let them struggle, and pupils must be willing to persevere in that struggle. From their analysis of successful and unsuccessful classroom processes aimed at encouraging high-level mathematical thinking and reasoning, Henningsen and Stein observed the following inhibiting factors:

- Pupils not used to ambiguity would pressure the teacher to provide explicit procedures for completing the task.
- Teachers tended to "take over" difficult parts of the task and perform them in order to manage pupils' anxiety.
- Teachers and pupils tended to drift away from a focus on meaning and understanding toward an emphasis on accuracy and speed, sometimes ignoring the challenging part of the task in order to get to the answer quickly.
- A lack of alignment between tasks and pupils' prior knowledge, interest, motivation, and learning disposition led to unsystematic exploration.
- There was sometimes not enough time allotted for pupils to grapple with the important mathematical ideas embedded in the task.
- The fact that pupils were not expected to justify their methods, that their unclear or incorrect explanations were accepted too easily, or that they themselves thought such work would not be "counted" all led to a lack of accountability.

Henningsen and Stein (1997) also identified supporting factors that maintain high-level demands:

- Scaffolding actions were undertaken by teachers or more capable peers whenever pupils were stuck, to provide assistance without reducing the cognitive demands of the task.
- Teachers or selected pupils modeled high-level performance.
- Teachers sustained pressure on pupils to provide meaning, explanation, and justification to demonstrate their understanding of the mathematics underlying the task.
- Teachers encouraged pupils' self-monitoring as they progressed through the tasks, giving them a sense of competence and control that, in turn, motivated them to remain engaged in the task.
- An appropriate amount of time was provided for the whole process.

The polar bear problem

The following is a discussion of the classroom experiences of three primary school teachers who tried using the polar bear problem (see Figure 1) with their pupils.

Figure 1 Polar bear problem

A polar bear weighs 500 kg. How many children from our class together weigh as much as a polar bear?

This open-ended activity aims to elicit pupils' high-level cognitive processes and mathematical creativity. It represents an important goal of mathematics education. In an open-ended situation, pupils are required to solve realistic problems where there is no known solution beforehand and not all data are provided. Such problems require pupils' own contributions to the process, such as making assumptions on the missing data. Because the weights of the children in the classroom are not provided in the problem, pupils have to think about and estimate the weight of an average child. There is no cue word for pupils to figure out which operation to use, as in a closed question. The polar bear context is also an interesting situation that could arouse curiosity in pupils who want to investigate. From a curriculum perspective the task has been designed specifically for the following high-level cognitive outcomes:

- Pupils identify the missing information critical to the question.
- Pupils make their own assumptions about the missing data: the weight of a child.

- Pupils access relevant knowledge and estimate the average weight of a child in relation to themselves.
- Pupils display number and measurement sense.
- Pupils must communicate their reasoning.
- Pupils display creativity in using possible strategies and solutions.

Three teachers from different schools used this problem with their P4 classes, which contained 39 to 40 pupils each. In all three classes the pupils worked in small groups. Three different levels of outcomes resulted due to the different orientations of the teachers in setting up the task. We compared features of the teachers' task implementation, pupils' engagement on task, and outcomes for factors that supported or inhibited high-level thinking and creativity in the pupils' work.

Three cases

Data for this study were drawn from the case reports written by the teachers themselves. This was part of a project involving inservice teachers enrolled in my course. The participants had to report on how they set up and implemented the task, made observations of pupils at work, took notes of pupils' behaviors and cognitive processes, and interviewed some about their attitudes toward such tasks and their participation in group work. They also had to analyze pupils' work, evaluate it, and reflect on their lesson outcomes.

Case of Teacher A: Successful

Teacher A set up an interesting introduction to stimulate interest and arouse curiosity in her pupils. She used a theme for them to identify themselves: "We are math investigators." She told them that as math investigators they were required to solve problems and explore as many approaches as possible. They were also required to explain, compare, and justify their solutions. Before introducing the actual problem, she showed pictures of various animals and discussed their habits and sizes. She was able to use cooperative learning strategies and provide appropriate scaffolding whenever the pupils needed help to move on. Initially there were looks of frustration among pupils who found the question ambiguous. The teacher appeased them with clarifications, without giving away too much information or reducing the cognitive level of the task. She asked the pupils why they thought the question in the problem was not clear. She also asked them what was needed to make the problem solvable. She observed that after clarification of initial doubts, pupils were more proactive and clear in their activity, and there was an obvious change in attitudes. While pupils worked in cooperative groups, she discouraged them from dismissing any of their members' ideas without first assessing them critically. They had to ask the "solver" to explain in detail and check the solution before moving on. At the end of the group session, Teacher A selected samples of pupils' work to share with the class and allowed other groups to comment on their friends' work.

Pupils' work

As the polar bear problem asked for "how many children from *our* class," most of the pupils tended to personalize the situation by using their own or their friends' actual weights. They could see that there was a wide range of sizes in the class. They did not see a global situation involving children in general. However, the groups came up with about eight different possible solutions. Some groups estimated weight of a small-sized or a big-sized pupil and used a reasonable proportion of such sizes to work out the answer. Four operations were used for calculation. Some pupils seemed to have worked mentally on the numbers first to make up the 500 kg. Some estimated the weight of a "skinny" girl as 25 kg, or a "fat" girl as 50 kg, then used the mental process of multiplication to work out the answer as 20 skinny or 10 fat pupils. This displayed their number sense in working with compatible numbers. There was an attempt to find an "average" weight among the members in the group, but this was impossible because one class member was larger than the others. One group performed at a low level without thinking strategically. This group attempted to add all the big-sized pupils' weights first and then added others to make up 500 kg. There were lots of addition computations, resulting in tedium, and this led to an incomplete solution. Figure 2 contains two successful pupil solutions.

Figure 2 Possible solutions from Teacher A's class

Directions: Think first for a few minutes before beginning to discuss. Listen to one another and try to understand one another's reasoning. Please show and explain your work using pictures.

Step 1: Count the skinny people and estimate their weights. The weight is 25 kg (1 girl = 25 kg) add up to 500 kg.

Step 2: Multiply the amount of people to the weight (people is 20).

Answer: 20 x 25 = 500 (amount of weight for 20 girls)

Step 1: Crystal is 21 kg and Delfina is 35 kg, so we round it off to the nearest 10. 21 kg = 20 kg. 35 kg = 40 kg.

Step 2: 5 (40 kg) girls = 200 kg. 500 kg – 200 kg = 300 kg.

Step 3: How many 20 kg girls = 300 kg? 300 ÷ 20 = 15. 15 (20 kg) girls = 300 kg.

Step 4: To check 15 x 20 = 300 200 ÷ 5 = 40. 300 kg + 200 kg = 500 kg.

20 children from our class weigh together as much as the polar bear.

Teacher A's reflection:

"Personally, I feel that such activity provides pupils with some kind of excitement, as they are required to relate with mass[es] of real-life objects. It actually challenges their minds to think beyond textbook answers and allows them to be creative. Honestly, I was surprised to see how active they were in getting the answer, as they knew that this type of investigative question can lead to more than one solution. The moment I mentioned this, the pupils tried to outdo one another in getting the best answer. During the presentation, pupils were exposed to the number of possibilities that their classmates could think of. At the same time, their presentation skills could also improve. On the whole the lesson is a fruitful and meaningful one, as it did bring out the creativity in the pupils. Pupils are able to think out of the box and provide logical reasoning."

Case of Teacher B: Too guided

Teacher B started with a preliminary problem, discussing with pupils the nature of an open-ended question for which they had to come up with their own assumptions. However, when she introduced and explained the polar bear problem to the pupils she asked them this leading question: "What information do you need to solve this problem?" She did not give pupils the opportunity to analyze and ask this critical question themselves. In a way she "closed" the problem, and hence the intent of letting pupils use high-level reasoning to identify the missing information, make assumptions, and access their own knowledge was somewhat curtailed. However, it was her belief that asking leading questions was useful to pupils to help them think through the steps and be systematic in their approach. She guided them in a method to find an average weight using the group members' weights. She then suggested that they make appropriate estimates of their own weights. As a result, most of the pupils' solutions followed a certain fixture structure modeled by Teacher B. Figure 3 contains an example of a typical presentation.

Figure 3 A possible solution from Teacher B's class

Look for clues:

1. How heavy is Barney?
2. What is the meaning of balance?
3. P4 child's weight?

How we decide on:

1. Weight of P4 children.
2. There are 4 pupils in my group. The total weight is 40 + 40 + 20 + 60 = 160. On average, weight is 40 kg. We take a P4 child's weight as 40 kg. 400 kg ÷ 40 kg = 10.

In a way, the performance of the pupils did decline to procedural thinking, except for the estimation on the weight of a pupil. From the observation of the pupils at work, Teacher B noted that leading questions from her helped them to look for the right clues and make the appropriate assumption about a child's average weight. There were few pupils who needed clarifications on how they could get a fair estimate of a P4 child. The teacher observed that these pupils were later guided by the better ones. The better ones found this sum interesting, and they went on to give other estimates to find different answers. A few pupils were slowed down because they could not agree on the assumption. Time was wast-

ed as they argued about the appropriate weight of a P4 pupil. The problem was resolved by a vote, and they consulted the teacher before making the final decision. Pupils were glad to note that, because it depended on the assumptions made, all their answers were not the same.

Teacher B's reflection:

"It was encouraging to note that pupils find the activity interesting and engaging. It was an effective way to get pupils to work independently with the proper procedures planned out. Although this is a mixed-ability group, most of them could understand the problem sum. The leading questions guided them along, so they had no problem looking for the right clues and coming up with the right assumptions. As such, most of them were able to give the answer correctly with some variations. The task motivated pupils to want to look for clues and engaged them in meaningful discussion to find the best assumption of the weight of a P4 pupil. It was also very satisfying to see pupils learn while they enjoyed themselves."

Teacher C: Unsuccessful

Teacher C may not have had a full understanding of the nature of the open-ended question and the cognitive demands of this task. She did not have the correct concept underlying the problem. In setting up the task, she made a big mistake by giving out copies of the weight/height list of every pupil taken from the school's physical fitness test file. She miscued the pupils by asking them to use the list to arrive at an answer in as many ways as possible "from adding the weights of the various pupils together that would bear the same mass as the bear's weight (500 kg)." She observed that three groups of pupils did not seem to have the slightest idea of what to do and took some time to get started. She encountered class management problems as some pupils did not work well with team members. Some pupils tended to dominate other weaker pupils within the same group. Some weaker pupils, when working alone, could not do anything. There was no evidence in her report of any scaffolding actions that she took to help pupils see the actual demand of the task.

Pupils' outcome

Pupils' engagement with the task declined from the very start, as Teacher C misconstrued the question and miscued the pupils. With the list of their classmates' names and weights in hand, pupils were interested only in getting an answer by selecting names and weights that would make up 500 kg. Hence, most of their solutions were lists of names of pupils and their weights. By way of "different" solutions the pupils tried varying combinations of their friends in the class but were mostly unsuccessful. The whole task was reduced to the tedium of adding many two-digit numbers without strategic processing to get a sum of 500. Many of the pupils' computations were unsystematic and were abandoned halfway through the process. A common example of pupils' work that declined to low-level performance is shown in Figure 4.

Figure 4 Methods used by Teacher C's class

Method 1	Method 2	Method 3
Wee Teng – 27	Amanda Chia – 42	Jonathan Chua – 45
Elaine – 36	Amanda Tan – 44	Yuk Yin – 47
Erica – 26	Eunice – 39	Yong Sheng – 48
Joey – 28	Isabel – 38	Dominic – 57
Yu Mei – 25	Shueh Wen – 43	Liang Sia – 58
Hwee Chin – 28	Eileen – 38	Jonathan Tan – 54
Zhi Ai – 28	Elaine – 35	Gabriel – 48
Alphonsus – 28	Benjamin – 43	Yong Chin – 47
Ben – 32	Jonathan Chua – 45	Amanda Chia – 42
Wei Zhen – 29	Kok Kiang – 38	Zhiai – 28
Jacob – 21	Yong Sheng – 48	Erica – 26
Jerome – 31	Yuk Yin – 47	
Ken – 29		
Lense – 32		
Adrien – 28		
Joryl – 34		
Eunice – 39		
17 people	**12 people**	**11 people**

Teacher C did not provide any reflection of her lesson, but when she handed in her lesson report she expressed doubt that what she had implemented was correct. In her case, she might not have a good understanding of the mathematical thinking embedded in the task and the kind of cognitive demands to be made of the pupils. Her pupils were not held accountable for the required high-cognitive

processes, as she accepted all their unsystematic trials. In the case of Teacher B, the lesson was partly successful, with pupils engaged in a systematic way, but the lesson was too guided to allow room for pupils' creativity. In her reflection, Teacher B still believed that it was important to guide pupils with a planned procedure, especially when the class was of mixed abilities. At a deeper level, she curtailed the openness of the problem by providing cues that would reduce the task to more procedural outcomes. Teacher A implemented the lesson successfully, with appropriate set-up of the task, and provided scaffolding that maintained pupils' high level of engagement. She did not give in to pupils' anxiety over ambiguity at the beginning.

Conclusion

The cases of Teachers A, B, and C support what research has found: Merely giving pupils high-level tasks in the classroom will not automatically result in their engagement in high-level thinking, reasoning, and sense making. A very important phase in carrying out open-ended high-level tasks in the classroom is the set-up phase, during which the teacher announces the task in such a way as to encourage students to use more than one strategy, use multiple representations, and supply explanations and justifications. This was very evident in the case of Teacher A, who successfully implemented the lesson. In the cases of Teachers B and C, pupils' engagement with tasks declined to lower levels of processing. In this study the task selected was appropriate to the existing mathematical knowledge of the pupils, although this was the first time they came across such an open-ended situation. Time was not an issue, as the task was not so complicated that it demanded much exploration. All of the teachers allotted appropriate time for pupils to completely solve the problem.

These three classroom experiences have implications for the role of the teacher in implementing open-ended tasks in which pupils are expected to actively engage in high-level mathematical reasoning and creative thinking. Teachers must shift paradigms toward a more process-based approach in which getting a correct answer to a problem is not the main criterion. Teachers often have a misguided idea that if they can come up with a set of procedures that pupils can follow, then pupils will be well equipped to solve problems. It might not help them to solve open-ended problems, which often do not have a precise answer or specific method of solution. If teachers carry this misconception into a process-oriented, problem-solving classroom they will be reducing a high-level problem to applying procedural skills. In implementing open-ended tasks, teachers must know the embedded mathematical ideas and connections that might evolve in order to create a classroom environment that allows pupils to take risks and ask appropriate questions. So as not to inhibit pupils' creativity in mathematical thinking, teachers must proactively and consistently support pupils' cognitive activity without reducing the high-level demands of the task. They should not give in to pupils' anxiety and show them how to get the answer. They should sustain pressure on pupils to provide meaning, explanation, and justification to demonstrate their deep conceptual understanding and higher order mathematical thinking.

References

Chang, S.C., Kaur, B., Koay, P.L., & Lee, N.H. (2001). An exploratory analysis of current pedagogical practices in primary mathematics classroom. *The NIE Researcher, 1*(2), 7–8.

de Lange, J. (1993). Innovation in mathematics education using applications: Progress and problems. In J. de Lange, I. Huntley, C. Keitel, & M. Niss (Eds.), *Innovation in math education by modeling and applications* (pp. 3–18). Chichester, UK: Ellis Horwood.

Foong, P.Y. (2002). Roles of problems to enhance pedagogical practices in the Singapore classrooms. *The Mathematics Educator, 6*(2), 15–31.

Foong, P.Y. (2004). Opening textbook sums for mathematical creativity. *Maths Buzz, 6*(1), 2–5.

Henningsen, M., & Stein, M.K. (1997). Mathematical tasks and student cognition: Classroom-based factors that support and inhibit high-level mathematical thinking and reasoning. *Journal for Research in Mathematics Education, 28,* 534–549.

Foong Pui Yee teaches at the National Institute of Education, Singapore. E-mail pyfoong@nie.edu.sg.

Margarita Lebedeva, Olga Shilova

The use of electronic portfolios in teaching pedagogical university students

Teachers and students get the most out of modern information technology when it is seen as an integral part of teaching and learning, not simply as a tool for collecting data. Student electronic portfolios offer one interesting opportunity for this kind of thoughtful integration. In this article we share our experience working with students at Herzen Russian State Pedagogical University as they develop their electronic portfolios. For our purposes the portfolio is defined as "not just a file of students' papers, but rather as an elaborated individual selection of student achievements made according to a plan" (*Student v pole informatsii i kommunikatsii*, 2000, p. 61).

Features of the electronic portfolio

New information technologies have produced major changes in the portfolio structure, because materials are submitted electronically, not on paper, and stored on compact discs. The use of electronic portfolios in training future teachers is especially important due to the growing popularity of information and communication technologies in teaching. More specifically, the electronic portfolio

- is more flexible and easier to handle—it is easier to change both the structure and the content of the portfolio;
- offers multiple opportunities for artistic presentation of the materials;
- allows use of various formats (e.g., text documents, spreadsheets, and diagrams); and
- offers possibilities for a multimedia presentation through the inclusion of animation and audio and video clips, either retrieved from the Internet or created by the students themselves.

Moreover,

- Individual students can easily combine their work through portfolios and can exchange entire portfolios, or parts of them.
- Electronic portfolios can include Internet materials representing alternative viewpoints.
- The electronic portfolio itself can be placed on the Internet and thus allow network interaction of students from different teacher-training institutions. Students from different cities and even different countries can create a joint portfolio.

Thus, the use of an electronic portfolio permits more diverse student learning, makes training more individualized, and allows students from different universities and even different countries to interact, creating more opportunities for active learning and critical thinking.

Functions of an electronic portfolio

The three basic functions of a portfolio include the following:

- storing of student papers;
- allowing each student to model an individual educational route and develop an individual learning strategy, giving preference to materials and activities the author finds the most interesting; and
- providing opportunities for creative reflection, as students grow familiar with strategies and techniques for using information and communication technologies and consider their application in the learning process and in future teaching.

Figure 1 **Electronic portfolios**

Purpose			
Portfolio—individual property	**Portfolio—account**	**Portfolio—project**	
Created for a student's own use	Created for the teacher's use	Created as an activity organizer	
Content			
Portfolio of achievements	**Reflective portfolio**	**Problem-oriented portfolio**	**Thematic portfolio**
Includes all products of students' work related to a certain content section	Includes all materials on the student's evaluation of purpose and achievement	Includes all materials presenting the purpose, process, results, and further prospects of solving a particular problem	Includes all materials presenting the student's work within a particular theme or module
Network status			
Individual	**Local**	**Global**	
Available on a personal computer	Available within a local computer network	Placed on the Internet	

Types of electronic portfolios

Electronic portfolios may be classified according to their purpose, content, and network status. The following chart in Figure 1 may be useful in helping you and your students make decisions about what kind of portfolio best serves your purposes. For example, a portfolio might be characterized as individual property, problem oriented, and local.

Here are some suggestions for using electronic portfolios that may be useful:

1. Try to make the portfolio count. Each student should realize why he or she needs this portfolio: It may allow its author to get a higher grade, or it may be a condition of getting credit for a course. In other cases, the portfolio may be necessary to prepare for an examination or be a part of the examination itself. Above all, the portfolio may become one of the most effective and visible results of the training course.
2. Select the portfolio type. The decision about what type of portfolio to use can be made by the teacher or the student. This selection is important, as it makes the process of compiling the portfolio more purposeful. However, sometimes it makes sense to allow a mixed type of portfolio to meet some special purposes.
3. Fix the deadline (by a certain date, by the end of the semester) and decide where and when students should work on their portfolios (in the classroom, during study hall hours, at home).
4. Define the optimal number of sections or rubrics. We usually use seven, including required and optional ones.
5. Work out assessment criteria with the students. Some criteria may be mandatory, such as presence of all required rubrics, neatness and orderliness, and meeting all formal requirements. The rest are more subtle and need to be worked out together with the students.
6. Before launching any activity, do not forget to inform the students of the assessment methods that will be employed.

Structure and content of the electronic portfolio

Large blocks of material or *sections* can be subdivided into *rubrics*. The number of sections and rubrics (as well as their content) is defined individually.

In our classes the portfolio structure used most often includes a self-portrait, information resources, working materials, and achievements.

In the self-portrait, student authors develop an essay, a photo collection, or some other way of introducing themselves. Students may use PowerPoint, design a personal webpage, or make up a résumé.

The information resources section contains any materials related to the theme of the portfolio that are not actually produced by the student. In the case of an electronic portfolio, important resources may have been found on the Internet or in electronic encyclopedias and manuals, including audio and video materials. This section may also include dictionary or encyclopedia entries, materials from periodicals, information received from the teacher, or illustrative materials.

The working materials section contains data used by the student author while performing the portfolio assignments: graphic materials (tables, diagrams, charts), texts of reports, various creative assignments, and tests.

The final section contains items that, in the student author's opinion, demonstrate his or her progress in learning. It may include the most successful pieces of work, comments by teachers and group mates, drawings, certificates, and the like. Each item should be accompanied by a reflective comment; the student should give reasons for presenting this particular piece of work as a personal achievement (see Figure 2).

Figure 2 Portfolio items that demonstrate achievement

- Results of tests and quizzes
- Results of teamwork, including rough copies and charts and problem-solving steps
- Projects
- Essays and written papers as well as drafts
- Audio and video materials and photos
- Graphic organizers such as charts, tables, diagrams, graphs, and histograms
- Reports about questionnaires and interviews organized by the author, and discussion of problems and questions that arose
- Homework assignments (this implies that the rest of the work was done in class)
- Worksheets, observation workbooks, reflections on the learning process, and self-estimates
- Letters to a teacher (or relative or group mate) about the student author's work with the portfolio; plans for further learning and research based on the portfolio materials
- Notes on classroom reports and answers connected with the portfolio content
- Description of laboratory work and experiments
- Samples of graphics or artwork, diplomas, certificates, and other evidence of the author's achievements

Where electronic portfolios work well

Portfolios work well in disciplines connected with psychology, theory of education, the humanities, and the social and natural sciences. Students at the Department of Electronic Communicative Aids in Teaching at Herzen Russian State Pedagogical University create electronic portfolios within the following courses: Computer Science, Technical and Audiovisual Teaching Aids, and Modern Technologies in Science and Education.

The materials presented in the electronic portfolio for Computer Science are mainly practical and creative assignments performed within this course. A portfolio on Technical and Audiovisual Teaching Aids contains materials to be used in teaching: teachers' notes for lessons in various subjects, classroom presentations, materials for remote support of the learning process, and various tests and rating systems. Students create this electronic portfolio while working on the term project, "Development of Didactic and Methodical Teaching Materials." The portfolio may include the following rubrics:

- Self-portrait: "The computer and I" (my dialogue with the computer as a teaching aid); "My expectations in studying the Technical and Audiovisual Teaching Aids course."
- Information resources: The Internet as a reserve of teaching materials; "What does it mean?" (conceptual and terminological dictionary); "Laws, principles, and rules" applying to the theory of the course.
- Working materials: "My own projects"; "Interesting projects of my group mates."
- My achievements: "My discoveries" (information I found surprising, and patterns and regularities I discovered); "My most successful assignments"; "Stimulus to success" (what helped toward the attainment of the objective).

The Modern Technologies in Science and Education course is attended by students working for their master's degrees. The aim of creating an electronic portfolio within this course is to collect materials that may be presented at scientific conferences or used for writing a master's thesis or scientific papers. Students have found the following rubrics useful:

Table 1 Assessment criteria

Criteria	Maximum points	Points gained	Comments
Presence of compulsory rubrics	2		
Presence of additional/individual rubrics	5		
The use of research methods	10		
Independence	10		
Artistic presentation of materials	8		
Effectiveness and utility for the author, availability of conclusions	10		
Comments of group mates	5		
Materials containing reflection	10		
Portfolio presentation	10		
Total	70		

- Self-portrait: "Why I started to work for the master's degree"; "Know—Want to learn—Learned chart" (Ogle, 1986).
- Informative resources: "Normative documents," "Materials from the Internet," "Materials on remote teaching."
- Working materials: "My own projects," "Interesting projects of my group mates."
- My achievements: "My discoveries" (information I found surprising, and patterns and regularities that I discovered); "Materials for scientific papers and reports"; "Stimulus to success" (what helped toward the attainment of the objective).

Assessment

Table 1 contains the assessment criteria we used, with percentages assigned to each section. This kind of chart can be used with your students, fostering discussion of what should count most and why. The criteria may vary, but some of them may be compulsory and some optional. However, the whole set of criteria is aimed, along with other things, at checking critical thinking.

An anonymous survey to find out attitudes of 90 students toward the electronic portfolio as a teaching strategy yielded a number of results.

- More than 90% of the students found the strategy very useful. Students were pleased that they had an opportunity to use the Internet while working with the portfolio, allowing them to compare alternative viewpoints and to study the problem from every side. Many emphasized the creative character of the portfolio—they had a chance to express themselves in this work and to compare their own results with the results of their group mates. Others stressed the importance of getting to interact with other students and added that this interaction provided mutual support. When working with an electronic portfolio, some students pointed out, you "do not stew in your own juice" but always keep in touch with others, and this urges you forward.
- Significantly, at least half of the respondents attached importance to the high degree of independence they enjoyed while working on their portfolios, and about as many mentioned the utility of portfolio materials for their further training and work—writing course and diploma papers, planning lessons during their student teaching period, and preparing reports for student conferences.

On the whole, we may say that students find the electronic portfolio interesting and important for their personal and professional growth.

References

Ogle, D. (1986). K-W-L: A teaching model that develops active reading of expository text. *The Reading Teacher, 39,* 564–570.

Student v pole informastii i kommunikatsii. (2000). *[The student in the field of information and communication.].* St. Petersburg: PETROC.

Margarita Lebedeva is an assistant professor in the Computer Science & Computer Engineering Department at Herzen Russian State Pedagogical University, St. Petersburg, Russia. E-mail margospb@yandex.ru.

Olga Shilova is a professor in the Computer Science & Computer Engineering Department at Herzen Russian State Pedagogical University, St. Petersburg, Russia. E-mail olga-shilova@yandex.ru.

Bernard Chemwei, Joel K. Kiboss, Emillia Ilieva

Effects of cooperative learning on teaching poetry

The Kenya National Examination Council (KNEC; 2000a) pointed out that literature in the secondary school curriculum is part and parcel of language learning. This is because reading is considered useful in helping learners to develop vocabulary, comprehension, and the ability to construct sentences. In other words, the study of literature in English in the current 8-4-4 (eight years of primary, four years of secondary, and four years of tertiary education) system is expected to provide student development and growth in intellectual, emotional, and linguistic aspects. It is also expected to help the individual learner develop an appropriate self-image and concepts of the community to which he or she belongs. It is for these same reasons that poetry is one of the genres of literature that is taught and examined in Kenyan secondary schools today.

Poetry in literature is taken to be a collective word for poems, while an individual poem is a form of creative expression that tells what people think or feel about something. A poem can be read, recited, or sung. In Africa, poetry has been in existence from time immemorial, and the poet serves several roles, such as teacher, historian, informer, and entertainer (Alembi, 2000). The Ministry of Education (MOE; 1992) observed that poetry can be very interesting and enjoyable and, like other genres of literature, may pose worthwhile intellectual challenges to students. This is because it has the potential to develop in students a sense of criticism and appreciation.

However, poetry has recently been cited by both secondary and college students as the most unpopular genre of literature (Auta, 2001; Kabaji, 2001). Amateshe (1992) has observed that in Kenyan universities students tend to tackle poetry as mere recitation. This is perhaps why a report by the Faculty of Education of Moi University (1990) said that poetry at the university level in Kenya is one form of literature that often causes nightmares for both teachers and students. Two years later, the MOE (1992) noted that not only does the teaching of poetry present teachers with considerable problems but also that pupils find poems difficult and inaccessible. Contributing to the same debate, Kanyike (2000) and Auta (2001) concluded that it is common knowledge that poetry is given a raw deal in many classrooms in Kenya, covered only in passing and with little attention to methodology. Besides, it is regarded as an exercise in comprehension, and students are only briefly exposed to it for the purpose of examination. Poetry, therefore, is not regarded as a serious course but rather as an inevitable bore. This could be why some students have come to regard poetry as difficult, abstract, boring, and mystifying (Kanyike, 2000).

The critical importance of poetry in the English language syllabus is due to the fact that it provides the student with intellectual, emotional, social, and linguistic development. However, the performance of students on examinations in this genre is appalling (KNEC, 1998, 2000b). One probable cause of this dismal performance is the inappropriate teaching approaches (i.e., lecture and teacher-led discussions and demonstrations) adopted by most poetry teachers. Use of different techniques results in substantial learning improvement, because when students

work together in small groups they are able to master and understand the material presented to them (Jacobs, 1997). This is because cooperative learning engages the learners in active exchange of ideas that not only increases interest among participants but also promotes critical thinking (Gokhale, 1995; Johnson & Johnson, 1998; Johnson, Johnson, & Stanne, 2000).These approaches have been heavily criticized for being teacher centered and encouraging passive roles on the part of the learners rather than active participation (Kanyike, 2000; Mboya, 2000). While the integrated English books suggest the use of group work in reading, dramatizing, discussing, and analyzing poems (Kenya Institute of Education, 1999), they do not indicate how these groups should be structured to facilitate better learning. Thus, group activities often fall short of their potential in promoting learning because students may be off task or not helping one another (Jacobs, 1997).

Nevertheless, cooperative learning as an instructional methodology can be a starting point because it may provide better opportunities for students to develop skills in group interaction that are needed in today's world (Chemwei, 2003; Kipruto, 1997). According to Johnson and Johnson (1998) and Panitz (2000), it is now a standard practice that is used in a majority of schools in the developed world and has proved useful in that it allows students to act as partners with the teacher and with one another to learn the course material. Besides, research has consistently shown that cooperative learning can provide students with better opportunities to analyze, synthesize, and evaluate ideas together (Abu & Flowers, 1997; Gokhale, 1995; Johnson et al., 2000; Slavin, 1995). Although empirical evidence (e.g., Cohen, 1994; Johnson & Johnson, 1998; Kagan, 1993) exists in other parts of the world to support the effectiveness of cooperative learning in a variety of subject areas, the extent to which this method is beneficial in the teaching and learning of poetry in Kenya is largely unknown. But without such empirical evidence to support the effectiveness of cooperative learning on the teaching of poetry, teachers and educators may not realize its value as an instructional methodology. Therefore, this study was designed to fill this gap by seeking to determine the usefulness of cooperative learning on students' academic achievement and views of their learning experiences in school poetry at selected secondary schools.

Purpose of the study

The purpose of this study was to determine the effects that cooperative learning in school literature has on students' academic achievement, as well as on the learning of poetry in Baringo District secondary schools. In order to achieve this, the research reported here was guided by the following objectives:

1. To determine the effects of cooperative learning on students' academic achievement and learning of poetry in school literature.
2. To determine the views held by students regarding their learning experiences in the learning of poetry in school literature.

Research design

This study adopted the quasi-experimental, nonequivalent, control-group pretest–posttest–retention-test research design. This quasi-experimental procedure adopted controls for all major threats to internal validity, except those associated with interactions with (a) testing and treatment, (b) selection and maturation, and (c) regression and reactive arrangements. Nevertheless, to control for interaction between selection and maturation, the schools were randomly assigned either to the control or experimental groups. Also, the conditions under which the instruments were administered were kept as similar as possible.

Moreover, regular qualified teachers of poetry (i.e., those who were trained and had taught poetry for at least two years) were requested to run the study, so as a result the subjects were less aware of the fact that they were being subjected to the experimental treatment (Koul, 1993). Furthermore, the administration of a retention test three weeks after the program ended took care of the novelty effect and assured the rate of retention of the learning content.

The study involved six groups including three control groups that did not

receive the treatment, and three experimental groups to which the treatment was given. Due to the lack of individual randomization of learners to groups (experimental or control), a pretest analysis (reported later in this article) was undertaken to determine the initial difference of the learners.

Subjects

The study involved 198 subjects taken from 33 purposively selected secondary schools that could be easily accessed from the Nakuru–Kabarnet and Kabarnet–Kabartonjo roads. Two intact classes situated in schools that met this criterion—categorized as mixed (coeducational), boys only, and girls only—were randomly selected and assigned to serve either as the control or experimental group. The experimental group comprised 40 students in the mixed-school, 25 in the girls-only, and 22 in the boys-only school category; while the control group comprised 40 students in the mixed, 44 in the girls-only, and 25 in the boys-only category.

Materials

Two treatments were employed: cooperative learning that served as the experimental treatment and a conventional method that served as the control. Cooperative learning refers to an instructional method in which students work in small groups toward a common academic goal. The subjects in the experimental condition were given an orientation on how to learn poetry using the cooperative learning method. They were then assigned to five-member groups in which they were required to remain throughout the course of the study. All students were issued manuals detailing the sequence of learning activities to guide them during the cooperative learning sessions.

Each learner was also assigned a role to play (e.g., group leader, timekeeper, checker, or elaborator). Furthermore, students were informed of basic group skills such as (a) everyone should participate, (b) members should help one another understand poetry content, and (c) all students are accountable for asking and giving help as they work together in groups. In the cooperative learning treatment, desks and chairs were also rearranged into groups within the classroom to enhance personal interaction. Eventually learners dramatized and presented poems in class, while the teacher evaluated their performance before giving them a quiz based on the poem at hand. The teacher compiled the marks, and members of the best three groups each got a certificate of achievement. These certificates were meant to enhance the learners' motivation and increase their participation (Giraud, 1997).

The conventional method, on the other hand, was taken to mean a classroom instructional method that employed verbal explanations, discussions, demonstrations, talk, and chalk. It followed the usual teaching mode adopted by most teachers in the teaching and learning of poetry, which is characterized by a form of oral communication by the teacher as information conveyer while students listen passively, reciting or reading passages from their textbooks, or answering the teacher's questions (Chemwei, 2003).

Procedure

Prior to the beginning of the study, a pretest was administered to all students using two instruments—the Poetry Achievement Test (PAT) and the Student Interview Guide (SIG)—that were developed to assess the learners' achievement and views about their learning experiences in school poetry. The PAT was meant to assess the students' understanding of poetry, while the SIG was used to garner additional information regarding the students' views of their poetry learning experiences.

The Poetry Achievement Test consisted of 10 structured items based on Henry Barlow's (1971) poem, "Building the Nation," taught during the course of the study (see Figure 1). The students were required to state and justify who the persona in the poem is; say what the poet is addressing; discuss some characters revealed in the poem; describe the mood and the tone of the poem; and identify and discuss the effectiveness of any three stylistic devices in the poem, the attitude of the poet toward each character, the meaning of certain lines, and the relevance of the title in relation to the last stanza of the poem.

A pretest on the PAT was administered to ascertain the subjects' equivalence prior to the commencement of the poetry

Figure 1 **Poetry Achievement Test (PAT)**

Admission no. _____ Class _____ Gender _____

Instructions

1. Please read the poem and try to answer all the questions that follow.
2. Take your time but do not spend too much time on any one question.
3. Read each question carefully and try to understand before answering.
4. If you do not understand something, please ask for help from the teacher.

Questions

1. Who is the persona in the poem? Justify.
2. What is the poet addressing in the poem?
3. Discuss the characters of the following as revealed in the poem:
   (a) The driver
   (b) The permanent secretary
4. Describe the mood of the poem.
5. What is the tone of the poem?
6. Identify and discuss the effectiveness of any three stylistic devices in the poem.
7. What attitude does the poet have toward each of the characters in the poem?
8. Discuss the meaning of the following lines as used in the poem:
   (a) Wine to fill the hollowness of laughs
   (b) Ice-cream to cover the stereotype jokes
   (c) And friend it goes against my grain
9. What is the meaning of the words below as used in the poem:
   (a) Luncheon
   (b) Menu
   (c) Belated
   (d) Sumptuous
10. What is the relevance of the title in relation to the last stanza?

course. All students were exposed to the same poetry content for eight weeks, with three groups using the cooperative learning program as the experimental group and the other three using the conventional method serving as the control group. A posttest on the PAT was administered to all subjects immediately after the poetry course, and a retention test was also administered three weeks later.

The Student Interview Guide The SIG, which contained four semi-structured interview questions, was used to capture the views of students regarding their learning experiences during the poetry lessons (see Figure 2). To eliminate the researchers' biases, the information supplied by the students was reviewed and copies were given back to them to confirm the data. This was done in order to increase the investigators' confidence in the reliability and validity of the results (Kiboss, 2000). The subjects' responses were coded and analyzed in percentages.

Figure 2 **Student Interview Guide (SIG)**

Student no. _____
School _____ Class _____ Date _____

1. My first experience about learning poetry in our class was
   (a) Exciting
   (b) Depressing
   (c) Fun
   (d) Confusing
2. What do you think about the ways of learning poetry that were presented in your class?
   (a) Easy to understand
   (b) Confusing and not easy to learn
   (c) Made me want to learn more about poetry
   (d) Made me hate the course
3. Learning poetry in my class was
   (a) A source of anxiety
   (b) Something to look forward to
   (c) Not exciting for me
   (d) Other—explain
4. How did you feel about learning poetry in your class?

Results

The objective of the PAT was to collect data for use in determining students' academic achievement in poetry. Because intact classes were used and no randomization was possible, it is necessary to determine the students' equivalence at the commencement of the poetry course. An analysis of the pretest results shown in Table 1 indicates that the mean scores for both groups (i.e., those using the cooperative learning program and those in the regular treatment) reveal some slight differences.

Table 1 **Comparison of pretest mean scores and standard deviations obtained by the subjects on the PAT**

Experimental (87)		Control (111)	
Mean	***SD***	**Mean**	***SD***
4.08	2.24	4.42	2.27

Table 2 One-way ANOVA results of the posttest and retention test mean scores obtained by the subjects on the PAT

Source	DF	SS	MS	*F*-ratio	*P*-value
Posttest					
Between groups	1	641.50	320.75	31.26*	0.000
Within groups	197	1786.39	9.71		
Retention test					
Between groups	1	698.90	349.45	40.33*	0.00
Within groups	197	1706.39	8.66		

*Statistically significant at $p < 0.05$.

But the ANOVA test *p*-value of $F(1, 197) = 1.103$, $p > 0.05$ for PAT reveals no statistically significant mean differences among the subjects at 0.05 level. This is a clear indication that the slight differences noted are negligible, and thus the subjects were similar and came from heterogeneous backgrounds.

Effects of cooperative learning on students' achievement in poetry

Overall, PAT posttest results subjected to a one-way ANOVA test (Table 2) yielded *p*-values of $F(1,1\ 97) = 31.26$, $p > 0.05$. This implies that the subjects in the cooperative learning program outperformed their counterparts in the conventional classes. A similar observation was also noted three weeks after the program when the ANOVA for retention test yielded a *p*-value of $F(1, 197) = 40.33$, $p < 0.05$), which is significant at the 0.05 level. This is another clear indication that the subjects in the cooperative learning program still outperformed their counterparts in the conventional program on the PAT and retained the content better three weeks after the treatment was terminated.

An examination of the school category ANOVA test results in Table 3 indicates similar observations. For instance, the ANOVA test results show that the mean differences among the subjects are not statistically significant at 0.05 level because *F*-ratios of $F(1, 40) = 4.96$, $F(1, 22) = 6.55$, $p < 0.05$, and $F(1, 25) = 8.13$, $p < 0.05$ for the mixed, boys-only, and girls-only school categories, respectively, are statistically significant at the 0.05 level. Similarly, the ANOVA test results of the retention test administered three weeks after the poetry course was terminated yielded *F*-ratios of $F(1, 40) = 10.14$, $F(1, 22) = 11.44$, $p < 0.05$, and $F(1, 24) = 8.66$, $p < 0.05$ for the mixed, boys-only, and girls-only school categories, respectively, which far exceeds the *p*-values at 0.05. This, of course, is a clear indication that the cooperative learning program was relatively effective in improving the students' academic achievement and retention of content across school categories.

Table 3 ANOVA of the PAT posttest and retention test mean scores obtained by the subjects by school category

Source		DF	MS	*F*-ratio	*P*-value
Posttest					
Mixed school	($n = 40$)	1	104.65	4.96*	0.029
Boys only	($n = 22$)	1	110.46	6.55	0.000
Girls only	($n = 25$)	1	178.48	8.13*	0.000
Retention test					
Mixed school	($n = 40$)	1	68.22	10.14*	0.000
Boys only	($n = 22$)	1	97.02	11.44*	0.000
Girls only	($n = 24$)	1	130.87	8.66*	0.000

*Statistically significant at $p < 0.05$.

Table 4 **Percentages of students' experiences with poetry learning program by school category**

Source	Experimental group			Control group		
	Girls	Boys	Mixed	Girls	Boys	Mixed
Helped understanding	100	91	86.48	35	27.02	22.50
Got helpful feedback	84	82	83.78	12.50	16.20	--
Stimulated thinking	68	63.63	70.27	17.50	16.23	12.50
Got new ideas	80	68.18	64.86	7.50	13.50	7.50
Enhanced active participation	98	90	89	10.33	12.62	10
Increased confidence	77	68.18	70.27	25	13.50	12.50
Boring/waste of time	0	13.63	8.10	55	72.97	45
Depressing/difficult	32	22.70	21.62	95	81.08	55

Effects of cooperative learning on students' learning experiences in poetry

Overall, responses of the subjects in the experimental treatment by school category collected using the SIG were compared with those of the subjects in the control condition using the conventional or regular method.

The findings in Table 4 reveal the feelings of the students using cooperative learning:

1. Students agreed that their learning experiences helped their understanding of the content (100% cooperative learning girls-only, 91% cooperative learning boys-only, and 86.48% cooperative learning mixed-school categories; compared with 35% traditional girls-only, 27.02% traditional boys-only, and 22.50% traditional mixed-school categories).
2. Students received helpful feedback from their learning experiences (84% cooperative learning girls-only, 82% cooperative learning boys-only, and 83.78% cooperative learning mixed-school categories; compared with 12.50% traditional girls-only, 16.20% traditional boys-only, and 0% traditional mixed-school categories).
3. Students said their learning experiences stimulated their thinking (68% cooperative learning girls-only, 63.63% cooperative learning boys-only, and 70.27% cooperative learning mixed-school categories; compared with 17.50% traditional girls-only, 6.23% traditional boys-only, and 12.50% traditional mixed-school categories).
4. Students concurred that their learning experiences helped them get new ideas (80% cooperative learning girls-only, 68.18% cooperative learning boys-only, and 64.86% cooperative learning mixed-school categories; compared with 7.50% traditional girls-only, 13.50% traditional boys-only, and 7.50% traditional mixed-school categories).
5. Students agreed that their learning experiences enhanced active participation during the poetry lessons (98% cooperative learning girls-only, 90% cooperative learning boys-only, and 89% cooperative learning mixed-school categories; compared with 10.33% traditional girls-only, 12.62% traditional boys-only, and 10% traditional mixed-school categories).
6. Students said that their learning experiences increased their confidence (77% cooperative learning girls-only, 68.18% cooperative learning boys-only, and 70.27% cooperative learning mixed-school categories; compared with 25% traditional girls-only, 13.50% traditional boys-only, and 12.50% traditional mixed-school categories).
7. Few students found poetry learning to be boring or a waste of time (0% cooperative learning girls-only, 13.63% cooperative learning boys-only, and 8.10% cooperative learning mixed-school categories; compared with 55% traditional class girls-only, 72.97% traditional boys-only, and 45% traditional mixed-school categories).
8. Few students found poetry learning to be depressing or difficult (32% coop-

erative learning girls-only, 22.70% cooperative learning boys-only, and 21.62% cooperative learning mixed-school categories; compared with 95% traditional girls-only, 81.08% traditional boys-only, and 55% traditional mixed-school categories).

It is clear that the majority of the subjects in the experimental classes in all the school categories found cooperative learning quite enriching in the learning of poetry. This perhaps explains why the subjects using the cooperative learning program performed well on the PAT. There is sufficient evidence to support the idea that conventional methods fail to provide learning environments that foster students' understanding and appreciation of poetry. There is overwhelming support from these findings to show that the cooperative learning program was modestly effective in promoting students' academic achievement and learning experiences in school poetry teaching.

Discussion

There are a number of results from this study that warrant further discussion. First, the significant academic achievement attained by the subjects learning poetry using the cooperative learning approach is a testimony to the effectiveness of intervention. This finding also supports recent research indicating that students using cooperative learning tend to perform better than their counterparts using conventional or so-called regular methods (Giraud, 1997; Johnson & Johnson, 1998; Panitz, 2000; Slavin, 1995).

In addition, the results seem to support the notion that the use of cooperative learning methods has the potential to engage learners in active participation in the poetry learning process. This is in agreement with the earlier suggestion by the MOE (1992) that effective poetry teaching should be interesting and enjoyable, thereby evincing worthwhile intellectual challenges. It may in fact help amplify the Kenya Institute of Education's (1999) integrated books suggestion by providing a structure for appropriately using small groups during poetry learning.

Although no formal data from teachers are available here to corroborate this claim, responses from the majority of students interviewed using the cooperative learning method revealed evidence of students empowered to learn from and help one another. This might be an answer to the problem of poetry instruction, which is currently viewed as an unpopular course by both secondary and college students due to the nature of ineffective instructional methods used. Such methods have long given students the false perception that poetry learning is just a recitation of poems or a cause of nightmares for poetry teachers and learners (Amateshe, 1992; Auta, 2002; Chemwei, 2003; Faculty of Education, Moi University, 1990; Kabaji, 2001). Apparently this situation may be corrected should literature teachers and curriculum developers consider the use of cooperative learning methods that have also proved effective in other countries (Abu & Flowers, 1997; Jacobs, 1997; Johnson et al., 2000).

In effect, the observed student learning experiences indicate that the use of the cooperative learning method can help students understand and master the poetry course material. This indeed supports the initial belief that poetry learning can be beneficial in that it can be a starting point of better learning opportunities for students to develop skills in group interaction. This is consistent also with findings of other authors who have reported that learning in cooperative classes tends to bolster not only better academic achievement but also the improvement of critical thinking and socialization (Abu & Flowers, 1997; Gokhale, 1995; Hirst & Slavik, 2000; Jacobs, 1997; Johnson et al., 2000). Finally, the data seem to suggest that poetry instruction, through the use of cooperative learning strategy, can indeed be a serious course, rather than a difficult, abstract, boring, and mystifying one (Kanyike, 2000).

Conclusion

The rationale behind the study findings reported in this article is based on two objectives:

1. To determine the effects of a cooperative learning program on students' academic achievement in the learning of poetry in school literature.
2. To determine the effect of cooperative learning on the students' views of their learning experiences in poetry teaching.

Evidence from data collected shows that the use of cooperative learning has indeed improved poetry learning in the selected secondary schools that participated in the present study. At the same time, the results of the study are further proof that the cooperative learning approach is beneficial as a teaching practice across cultural borders. The results of the study should serve as baseline data with which future evaluation studies on cooperative learning implementation in other literature areas may be compared. On the basis of the present findings, two major recommendations can be made to guide the improvement of poetry teaching in our schools. It is expected that poetry teachers, language and literature department heads, and policymakers will seriously consider these recommendations because they can have a positive impact on the effectiveness of literature teaching.

First it is necessary to assess the key benefits of the program, because this not only may convince poetry teachers to embrace the use of cooperative learning but may also improve literature instructional practice in our classrooms both at the local level and in other areas. The key benefit of the program, supported by the findings of this study, is that the cooperative learning approach is an effective instructional intervention that can improve students' academic performance and learning experience in the literature curriculum.

Second, the results point to the need to encourage the development of cooperative learning strategies in more literature areas to realize the full potential and benefit of the program to school literature and language curriculum. It is recommended here that significant effort be made to improve literature- and language-teacher education and curriculum development programs to include the integration of the cooperative learning strategy. This may also mean providing teacher training programs that will ensure the competence and effectiveness of literature-practicing teachers who use cooperative learning approaches.

Although this study demonstrates some considerable potential of cooperative learning to improve poetry learning in school literature, there still remain some important questions that warrant further attention:

1. The research provides strong indications that the use of cooperative learning is effective for poetry teaching. However, future studies are needed to determine ways in which cooperative learning can be applied to other literature topics as well.
2. The results of this study suggest that cooperative learning offers significant potential for the improvement of poetry learning. However, several logistical and methodological barriers must be overcome before this potential can be realized. Therefore more studies need to be conducted that compare other approaches to learning, such as individualistic and competitive methods with the cooperative learning strategy.

References

Abu, R.B., & Flowers, J. (1997). The effects of cooperative learning methods on achievement, retention, and attitudes of home economics students in North Carolina. *Journal of Vocational and Technical Education, 13*(2), 1–8.

Alembe, E. (2000). *Understanding poetry*. Nairobi: Acacia Stantex.

Amateshe, A.D. (1992). *An anthology of East African poetry*. Nairobi: Longman.

Auta, M. (2001, April 14). Towards a deconstruction in the teaching of poetry. *The Sunday Standard Newspaper*, p. 25.

Barlow, H. (1971). Building the nation. In D. Cook & D. Rubadiri (Eds.), *Poems from East Africa* (pp. 8–11). Nairobi: East Africa Educational.

Chemwei, B. (2003). *Effects of cooperative learning on students' achievement and attitudes towards the learning of poetry in selected secondary schools in Baringo District, Kenya*. Master's thesis, Egerton University, Njoro, Kenya.

Cohen, E.G. (1994). *Designing groupwork: Strategies for the heterogeneous classroom*. New York: Teachers College Press.

Faculty of Education, Moi University. (1990). *Teaching practice guide*. Eldoret. Kenya: Author.

Giraud, G. (1997). Cooperative learning and statistics instruction. *Journal of Statistics Education, 5*(3)*, 89–100*.

Gokhale, A.A. (1995). Collaborative learning enhances critical thinking. *Journal of Technology Education, 1,* 1045–1064.

Hirst, L.A., & Slavik, C. (2000). Cooperative approaches to language learning. In J. Reyhner (Ed.), *Effective language educa-*

tion practices and native language survival (pp. 133–142). Choctaw, OK: University of Oklahoma.
Jacobs, G.M. (1997). *Using cooperative learning to maximize the success of group activities in reading*. Paper presented at the Singapore Symposium on Reading for Success, SEAMEO Regional Language Centre, Singapore.
Johnson, D.W., & Johnson, R.T. (1998). *Cooperation and social interdependence theory*. Edina, MN: Interaction.
Johnson, D.W., Johnson, R.T., & Stanne, M.B. (2000). *Cooperative learning methods: A meta-analysis*. Minneapolis: University of Minnesota.
Kabaji, E. (2001, May 13). How teachers have killed poetry. *The Sunday Standard Newspaper*, p. 15.
Kagan, S. (1993). *The structural approach to cooperative learning: A response to linguistic and cultural diversity*. Washington, DC: Delta Systems and Center for Applied Linguistics.
Kanyike, E. (2000). *Literature torn down to pieces*. Chogoria, Kenya: Melta.
Kenya Institute of Education (KIE). (1999). Needs assessment survey report on secondary education curriculum (*KIE Report series No. 64*). Nairobi: Kenya Literature Bureau.
Kenya National Examination Council (KNEC). (1998). *1995 and 1996 KCSE examination reports*. Nairobi: Author.
Kenya National Examination Council (KNEC). (2000a). *KCSE regulations and syllabus*. Nairobi: Author.
Kenya National Examination Council (KNEC). (2000b). *1997 and 1998 KCSE examination reports*. Nairobi: Author.
Kiboss, J.K. (2000). Teacher/pupil perspectives on computer-augmented physics lessons on measurement in Kenyan secondary schools. *Journal of Information Technology for Teacher Education, 9*(2), 199–218.
Kipruto, J. (1997). *The influence of academic performance, gender, and class level on cooperative attitudes of secondary school students in Baringo, Kenya*. Master's thesis, Moi University, Eldoret, Kenya.
Koul, L. (1993). *Methodology of educational research*. New Delhi, India: Vikas.
Mboya, T.M. (2000). *How to find meaning in poetry*. Eldoret, Kenya: Western.
Ministry of Education (MOE). (1992). *A guide to English teaching in Kenyan secondary schools incorporating in-service notes and activities*. Nairobi: Government Printers.
Panitz, T. (2000). Benefits of cooperative learning in relation to student motivation. *College Teaching, 6*(3), 1–9.
Slavin, R.E. (1995). *Research on cooperative learning and achievement: What we know, what we need to know*. Baltimore: Johns Hopkins University.

Bernard Chemwei teaches at Kapsabet Boys High School in Njoro, Kenya.

Joel K. Kiboss teaches in the Department of Curriculum and Instruction at Egerton University, PO Box 536, Njoro, Kenya.

Emillia Ilieva teaches in the Department of Literature at the same university.

Ranjan Ghosh

Ethnocentrism and the interpretation of text

[T]he teacher must teach the pupil to think. I saw a teacher once going around in a great school and snapping pupils' heads with thumb and finger and saying "Think."
(Robert Frost in Cox & Lathem, 1977, p. 41)

Having taught in universities in different countries, I feel that textual interpretation, especially in the Indian classroom, has been colonized in the sense of discounting the Indic potential of theory-paradigms and celebrating the "westernization" of textual interpretation. But this does not mean I advocate Indocentrism; reading for me can never be strictly centric, and it is also awkward to suggest an alternative pattern of reading. Both reading and classroom instruction need to hinge on the transactionality of an "interpretive" space that admits theoretical and epistemological inputs from both the Indic and the Western traditions.

This is what I have termed the (In)fusion approach (Ghosh, in press). It is provocative to think through a textual lesson in "creative turns and surprises." I have argued that "the text breathes better under the efficacy of a transcendent horizon of possibilities that ingresses into the economics of theory/conceptual spheres without being assimilated or absorbed into any one of them." Brooding on a text means becoming trained to read and be taken into the text. "The text for me needs to be safeguarded by a radical transcendence, a horizon of otherness, bulwarking against any single-motor theoretical slavish subordination." The grammar of Eurocentrism or Indocentrism can be to our potential undoing, for confining textual reading within a hegemonized theoretical space would mean denying a creative "crisis" in which all discussion inside and outside the classroom should revel.

In restudying what we have been doing in the classroom, the "colonized" Indian classroom should not abandon its existing methodology or discursive framework: rather, it should create a critique of these that can transform and extend them positively. Derrida points out that in pedagogy what is unacceptable is neutrality and what becomes essential is activism (Kearns & Newton, 1980). This "activism" through (In)fusionist strategies inspires the recasting of textual lessons in a field of differential forces; it questions the institutionalized axioms that simply promote old ways of instruction, and instead reconstitutes these preexisting forms and practices within a "transactional space" of cross-discipline/cross-border knowledge. My (In)fusion approach prefers to remain with Derrida and look for a complementarity that is "combative" without being mutually militant. Derrida (1979) wrote, "Combat simultaneously, and joyously, without accusation, without trial, without nostalgia, with an intractable gaiety" (p. 43).

So this transactional space is the nerve centre of noisy assertions, competing concepts, and paradigm vigilance—a creative-critical border patrol. For Barthes (1977), a subversive teacher has to be a "joiner": "one who joins the university to change things, one who joins the schools to change the way literature is taught" (p. 149; see also Barthes, 1985). For me, one can "join" the Indian classroom as a subversive teacher to conform and reform the way a text is envisaged to unfold: The

text will be conceptually "thumbed" and thoughtfully marked out by this "joiner" or "(In)fusionist."

The structure of English departments in Indian universities demands a certain institutionalization of instruction, which fails to inspire this transactional activism. Indian classrooms cannot encourage flexibility of text and cross-pollination of knowledge, because students preparing for their examinations are instructed to proceed in ways that ensure high grades. The "unleashing" program of the joiner and the (In)fusionist militates against this institutional rigidity and the pedagogical bias that discourages an innovative or constructionist classroom milieu and a productive teacher-student relationship.

A student reading Samuel Beckett's plays in an Indian classroom will not be allowed to think beyond the absurdist parameters within which his thoughts are seemingly imprisoned. There will be no desire for pedagogical rethinking that would make a vibrant intellectual crossover possible. There is no denying the "clandestine way" in which literature buys our assent and engineers a "slow transformation of the mind"; truly, "the teacher must negotiate and make visible what is merely clandestine" (Rajan, 1993, p. 278). Beckett's plays need not appear as a monument of "specialized high culture," but within the "(In)fusionist" *space* a quest for the "clandestine" can begin and critical awareness can plant its little pliant foot. While there is always the need to know and assess the received tradition of meaning, this strategy in our teaching can influence students toward opposing points of view. This transactive ground in pedagogy—this cross-fertilization—is not a pointlessly specialized activity; rather, it is the fundamental obligation to live self-reflexively.

So a "thinking classroom" would promote an (In)fusion approach to our encounters with text. It breaks the hermetic seal around the text. The (In)fusion approach seeks to evolve new patterns of meaning, "fighting," as Foucault would attribute it, through institutionalized discourse-formation. How would one revitalize a thinking space in a classroom when a widely read canonical text like Beckett's *Waiting for Godot* needs to be taught? My experience with the Indian classroom tells me that it has traditionally shrunk from being adventurous, choosing instead the well-trodden paths of interpretation. Students are instructed in a rather prescriptive mold about the existential and absurdist paradigms, with perhaps the most adventurous among teachers choosing to touch upon the Buddhist philosophy of flux and *sunyavada*. But once the students are made to rethink the very concept of "waiting" for Godot, the zones of understanding seem to shift with critical alacrity and acumen. Drawing on the parameters of Indian philosophy—like the doctrine of *karma*, the concept of *dharma*, and Indian value systems—and several strands of European continental philosophy, the students in the classroom can be made to think deeply and long over the hitherto unexplored dimensions of Beckett's play. The conscious use of conceptual constructs/terms inevitably allows the students to get acquainted critically with them; it also pries open the interpretive areas that germinate within the proposed transactional space. Classroom pedagogical skills involve strategies that would normally simplify the concepts and in a perceptive lucidity explain the paradigmatic correspondences. Should we read Beckett's play only as an archetype of absurd drama and situate his ideas within the existential tradition of Western philosophy? Can we engineer a reading that, in its refusal to admit such interpretive normalization (not the interpretive validity of such arguments), unearths the play as having a theological and existential hope and consequence?

The (In)fusion multibind comes into play when the absurdity of existence or existential void and vapidity are conflated with the concept of *avidya* (ignorance) and *maya* (illusion springing from ignorance); it is the state of *tamas* (the darkness born from ignorance). In Beckett's play, Vladimir and Estragon find themselves in this *tamasic* state, which, as Heidegger and Kierkegaard would point out, is the inauthentic state of existence. The first question that the class faces is whether we can strike the note of correspondence between *avidya* and inauthenticity. Ignorance comes from our debilitated understanding of the self and its relation to the outer world or the greater

Photo: Danguolė Žalytė

world. It is a negative acknowledgement of our finitude.

Because we are prisoners of our finitude, we lack the proper knowledge of the self (Hindu philosophy would term it as *jnana*—wisdom). The circumstantial reality *appears* depressive and soul-killing, making us choose inauthentic modes of existence and accept *avidya* as the "unyielding sureness of reality." However, this everydayness in "waiting" can be interpreted in the light of "positive inauthenticity" where Godot is seen as the "caller" in the Heideggerian sense of the term.

The (In)fusion approach addresses the provocative correspondence between "discriminative knowledge" in Hindu philosophy and the authentic–inauthentic binarism in modern European philosophy. Godot is seen as the being that inspires the "becoming"; it is interpreted as the ultimate authentic self that is worth waiting and aspiring for. The (In)fusion approach would instruct us to look at the *dharma* of Godot's *Dasein*. We know that the Godot-awaited or Godot-denied world is the product of our amorphous intelligence and our incomplete knowledge of the self and its relation to the world. This *adharmic* or inauthentic state of existence can be expected to be redeemed if we try to locate the "sparks" in Vladimir, in particular where he feels the urge for a Kierkegaardian leap into a separate level of authentic functionality. Here the momentum comes from realizing the potency of *karma* or the doctrine of action/duty/vocation. We need to point out that it is Vladimir who says, "But it is the way of doing it that counts, the way of doing it, if you want to go on living" (p. 60). Here are some of the exchanges that would give us the leverage to venture further into the territory we have already stepped upon.

> Vladimir: Let's wait and see what he says.
>
> Estragon: Good idea.
>
> Vladimir: Let's *wait till we know exactly how we stand*.
>
> Estragon: On the other hand it might be better to strike the iron before it freezes.
>
> Vladimir: I'm curious to hear *what he has to offer. Then we'll take it or leave it*. (Beckett, 1956, p. 18, italics added)

Does this not provoke the argument that anticipating the future (*Vorlaufen*) or "active waiting" is privileged to an extent over mere waiting (*Erwarten*)? Do we not find the seeds of a struggle in Vladimir and Estragon to rethink their inauthentic modes of being? "The way of doing it" and the curiosity to wait and see what Godot has to deliver are messages to read the "waiting" from a positive perspective that does not make the world of the play

a meaningless void, a pointless scripture of inertia, inaction, and angst. So the "waiting" inspires to an extent a karmic reflexivity in Vladimir (the effort to act and think with a modicum of individuality), a sense of anticipating the final emancipatory moment when Godot will arrive as the messenger of redemption. Is this a sort of *moksha* (liberation) from all meaningless suffering, soul-stultifying anomie, and *avidya*? This interpretive dimension of the play sees the "waiting" as a means of liberation (*Umkehr* or *moksha*), as a phenomenon that makes one realize the inadequacy of spiritual existence, and as providing momentum to reconfigure the inauthentic patterns of existence, with a hope of struggling for the realization of the ultimate *dharma* of existence (Ghosh, 2004).

My approach to teaching thus throws a gauntlet at "textbook culture"—the stultifying "normativeness" of accepted critique. We feel urged to debunk priestly literary paradigms, affiliated monolithically with the West, and to place ourselves within the *topos* where the academic rites of both East and West are laid on a reformulated and reconsecrated altar of literary studies. The Indian classroom needs an intellectual *glasnost*, cross-border in theory and application. If the West tends to colonize all texts within its own theoretical calculus, the East most often fails to overcome its own tendency to smooth over contradictions and to move toward a hermeneutics of "oneness." When these tendencies are recognized, what becomes apparent is a conspicuous divergence between the deployment of the critical criteria of the Sanskrit tradition in evaluating Sanskrit poetry and a whole new set of criteria for appraising English poetry.

As a strong challenge to such pedagogical/hermeneutical monochromatic orientation, we can now choose to probe at the roots of Robert Frost's theory of poetry from the rich and profound tradition of Sanskrit literary theory and see how Frost's ideas and practice can be revisioned within such parameters. Sanskrit tradition need not simply evaluate Sanskrit poetry, and self-immuring English tradition need not revel as the sole arbiter in the appraisal of English poetry.

How can an American poet's understanding of poetry be brought into a space that appropriates several conceptual strands from the strong traditions of the East into a resonant correspondence? Doesn't our understanding of conceptual–epistemic cross-pollination arm us with a much-needed pliancy in dealing with text, which eventually widens our scholarly horizons? Indeed, teaching or reading English literature can then provide access to and a blending of literary formulations drawn from the differing epistemological knowledge and positions of both the Western and the Eastern canon. The classroom, whether it be in India or elsewhere, requires this innovative and recultivated space that promotes all possibilities for an (In)fusionist discourse.

For Frost a poem is a "performance"; it performs under several figural and aesthetic nodes. The rider in "Stopping by Woods on a Snowy Evening" or the boy in "Birches" have put forth an experience that Frost would qualify as saturated with ideas "without being a series of stabbing meaningless flashes" (Lewis, 1947, p. 65). Poetic images for him have the feeling vector, and Frost is very careful to build the images with the radiance of emotion and "ideas." This poetic attitude of Frost can be interpreted further through the *Rasa* theory in Sanskrit poetics. The boy as the swinger of birches symbolically follows the bipolar dimension in Frost's poetic circuit, where he celebrates individual desire and also social motive; Frost allows the poetic intention a free range without being oblivious to social obligations or responsibilities that might impinge on that freedom. This is what Frost means by "answerabilities."

He endeavors to pattern one aspect of life—be it apple picking or a patch of old snow—upon a sensation or upon a moment in time, and then tries to perceive a spectrum of truth, growing thereby toward an understanding based on that focal point. Is he then always gravitating toward the significance of "form"? His profound consciousness of form opens up the subject of *akriti* (form) in Sanskrit aesthetics. Frost sees form as a cohering mental process, the catalyst by which "chaos" gets meaning. It is then the integration of substance and form that Sanskrit aestheticians would term *Nispatti*; it is a vital way of interfusing *dravya* (poetic material), expression, function and the rest. Through such form, as Frost wrote in

"The Aim Was Song," man first took the wind and "by measure blew it forth."

But understanding Frost from the standpoint of *akriti* means realizing the need for propriety in such integration. It is a great challenge to Frost to put man's "bursting energy and originality" under good governance—"his speed and his traffic police" as he points out (Poirier & Richardson, 1995, p. 869). (In)fusionist intervention on the part of the "joiner" demands that students be made to encounter the concept of *aucitya* here. *Aucitya* is "propriety" at all levels of understanding, and when Frost calls for the exclusion of "inessentials" from poetic composition and understanding it is *anauchitya parihara*. Poetry for Frost is the whole orchestration of a performance; it can be defined within the perimeter of *aucityam rasassiddhasya* (the consummation of an aesthetic experience with energy and an accompanying propriety).

The concept of *aucitya* also makes us invest more thought into Frost's understanding of poetry as "a measured amount of all we could say and we would." He wrote, "We shall be judged finally by the delicacy of our feeling for when to stop short. The right people know, and we artists should know better that they know" (Poirier & Richardson, 1995, p. 869). We have to acknowledge Vyasa's *kausala* (the dynamic skill) and Bhamaha's concept of *sauhitya*, which in Sanskrit means composition as integration. But *akriti* or *rupa* (form) is always measured out by the knowledge of "knowing when to stop." Students stand to enrich themselves in their understanding of this dimension of Frost's poetic attitude through *aucitya*.

We know that Frost's art is not a mere compromise between meaning and meter; it is an ideal structure which derives from poetic action. Almost all his poems testify to this proposition. Meter for him is not self-determining but is determined by the demands of "feeling." In the course of instructing my students I would put it as tones of voice>feeling>sense>poetic situation>meter. However, as Frost puts it, rhythm needs to be "on something that trips it" (Barry, 1973, p. 20). It is here that the correspondence with Sanskrit literary theory comes into special focus, for we have the shared epistemic approval in promoting a "ruffle" in the meter where the "strain" is "creative" (to quote the words that Frost uses). This leads us to the strong field in Sanskrit poetics where *samghatana* (word complex) produces the verbal music in harmony with *rasa*, feeling. This means that Frost's dual "answerabilities" (inwardness-outwardness dialectic) under an evolving *samghatana* (again, performance>conflict>drama>tension>trial>form or *rupa*) could not have striven for anything other than feeling and organic form. Poetic necessity is inseparable from sensory form; thoughts set forth or suggested by Frost's poetic art are the means that move together with the sounds, the cadences, the meter, and the embellishments to provoke a particular tension or exaltation, which in turn produces in us a world or a mode of existence altogether harmonious.

This needs to be illustrated for students with examples from Vamana's *Kavyalamkara Sutra Vritti* (1953) and Mammata's *Kavya Prakash* (1950), which provide us with expository notes on all these aspects and also lead us to the concept of *kavyapaka*, which means maturity in poetic expression or organic art. Frost's writings and the arguments of Mammata and Vamana point to a maturity in word and content (*sabdapaka* and *arthapaka*) that conflates their ideas on maturity of/in art and the necessity of having a harmonious aesthetic whole.

Understanding "maturity" in Frost's art transactionally means that we need to dwell on his critical obsession with metaphor or *rupaka*. Metaphor for him is not the simple and static pairing off of correspondences; rather, it is creative and vital with critical "amplitude." Under Indian logic, the Naiyayikas acknowledged *upamiti*, comparison, as the potential source of knowledge. So we may read Frost's "correspondence" in metaphor with what Viswanatha in *Sahityadarpana* (1931) would perceive as a new understanding between the *visaya* and *visayi* (the immediate meaningful feel of the subject and the meaning that can be gleaned metaphorically out of it) of the *rupaka*. Frost would regard this process as a way of sorting out, of discriminating meaning from the language that contains it.

Students can be made to confront the depth of what Dandin meant by *tadrupapratiki*, where the inherent thrust is on

the cognitive-perceptive act of the poetic mind that in discerning the "correspondence" moves toward greater expansiveness. For Frost metaphor is a "very living thing." Yet this is neither a self-determining progress nor a jumping grasshopper "whose day's work gets him nowhere" (Cox & Lathem, 1966, p. 77; also see Ghosh, 2000). Frost, like Ananda Vardhana (1975) and Mahima Bhatta (1964), sees in it a functional and organic role. So what the whole classroom can collectively infer is that Frost's insistence on the proper poetical education in metaphor is an aesthetic creativity that hinges on a resonant construct of similitude (*upama prapancha*) and contributes "discipline and direction" to the concretization of feeling (*rasa kshipta*); it is as important an organizing principle in Frost as it is in the philosophy of Indian poetics.

After dwelling briefly on these two illustrations (there obviously can be many more) can we assume that the classroom is thinking deeply and productively? Are we provoked and inspired to rethink our ways with the text to which we have committed ourselves in the class? (Ex)centrism in teaching is not a law; it is a diligently innovative effort to spring a "surprise," to tease a meaning out of an interaction whose nature we have overly familiarized ourselves with. Most important though, an Indian approach or the application of Indian aesthetics or theory to the study and teaching of English literature should not cloister itself in an Indocentrism that becomes a dead end again.

One need not wallow in the misconception that promoting the transactional space insinuates a counterdogmatic—that is, an Indocentric approach in which the Indian student, teacher, or critic has a bounden duty to wriggle free from the shadow of "colonized methodologies." Such counter-dogmatism would risk itself being called the "hegemony of dehegemonization," blunting my proposed interpretive program. (Ex)centrism in teaching is a matter of "textual gazing" and "textual poaching" in which students can be taken by surprise. Its methodology need not be self-immuringly traditional; the scholarship needs to be democratically vast; the approach has to be creative or "experimental" without being nonsensically reckless. Devy (1998), quite perceptively, saw more profit in the meeting of the two shores. He saw enrichment in such cross-polarization where literary composition becomes the meeting ground.

This is interesting primarily because the interpretive space enhances its potential with whatever it can draw, with critical judiciousness, from the conceptual richness of both the hemispheres. "At such a juncture, student, teacher, critic, all alike have to take care that the use of the new mode of discourse does not become an end in itself or does not turn into a smoke-screen raised to obscure the text" (Marathe, Ramanan, & Bellarmine, 1993, p. 244). With it, the (In)fusionist discourse within the bounds of transactionality should include the "traditional" and the "subversive" paradigms; such perceptive interventions enrich my student's experience of the text, his/her catholicity in hermeneutic reformulations, and the critical self-development in that generative "space."

Here I should hasten to interject that students need not abuse their critical liberty within this interactive space. The conceptual/theoretical interplay should acknowledge the limits of theory and the sensitive zone of textual protectionism as well. This, also, becomes a space that spawns the rare experience where the temporal and the cultural cohabit with the ideological, in an "inwardness" that trains our sensibility and recharges our affective and intensive responses—a pedagogical mimicry, as one might call it. This is our new poetics in classroom teaching, cultivating a rejuvenated critical awareness in our study of English literature. This awareness fosters an integrated, nonschizophrenic approach that amalgamates and accommodates. The potential richness of this cross-fertilization between the continents leads not just to a celebratory but a liberating mode.

Though I have shown how the Indian classroom could celebrate countercurrents that can recast contexts, this effort is true for all classrooms in all countries. Making alternatives possible would let the university emerge, as Readings (1996) argued, as a "shifting disciplinary structure that holds open the question of whether and how thoughts fit together" (p. 191). Thinking deep and hard about how thoughts can be fitted

together implies rethinking the categories and predispositions that have gone into the governance of our intellectual life in the classroom. A text becomes a victim of "institutional pragmatism" when its identity is normalized. Michael Ryan (1982) pointed out the institutional dictates in maintaining "unproblematic ontology ('integrity'), teleology ('cohesive purpose'), and logocentrism ('rationalism,' no 'ambiguity,' clear and determinable meaning)" (p. 50). But does this mean that efforts to foster new developments in the classroom or radicalize our approaches to instruction would sound like institutional delegitimation? Teaching Aristotle's *Poetics* to my students becomes an experience that is inhibiting for institutional forces that would imbed the lectures within the precincts of Greek poetics and drama. Skeptical unease often meets the effort to break free into territories that encourage a conceptual delicacy in understanding the concept of imitation in Indian poetics or pry open "unheard melodies" in its conflation with Bharata's *Natyasastra.* (Am I violating "integrity" and "cohesive purpose"?).

LaCapra (1998) was right when he pointed out that the fragility of disciplinary definitions often breeds intolerance and a penchant for ostracism in those who desire a secure professional identity and identity-forming disciplines at any price. In fact, LaCapra's arguments substantially support what I have been trying to emphasize. These arguments demand questioning of the "established protocols of inquiry" and the "coterie of classically educated gentlemen for whom canonical texts function as the verbal analogues of the school ties" (p. 46).

What "training" are we proposing for students to ensure a comprehensive mastery of the core curriculum? Should our training as intellectuals be similar to that of professionals like doctors or lawyers? Are mere intelligence, specialization, and innovation enough to outline our role as "joiners" or (In)fusionists in the classroom? Ryan (1982) wrote,

> The practice of knowing is itself already a form of bias, since it entails selecting and excluding, more often than not, according to historically determined institutional norms of what *should* be studied and known. Literary critics, for example, are supposed to know certain things, and not others—good style, for example, but never economic theory. The disciplinary segmentation of the world implies imperatives that govern the limits of what can, legitimately, be known. (pp. 55–56)

Ryan, in common with all radical teachers like me, would not approve the prescribed limits of knowing, where "requirements" are well outlined and expected to be nontransgressive. This is tantamount to infecting our encounters with the text in the class with a "bias" that knows already what to exclude and what to include under institutional impress and threats of legitimation. An (In)fusionist or "joiner" opposes this shackling mode of "disciplinary segmentation." Imparting a particular form of lesson or understanding a text in a certain way is a reminder that perhaps a natural, pure, and unbiased approach in teaching is unachievable. What can be decently approved, then, is a reciprocal exchange between institutional pedagogy and an (In)fusion approach that challenges the "purity of boundaries." If teaching can never be unbiased and if creation of a neutral space in the classroom is impossible, then our role as staid adherents of traditional and time-tested modes of instruction is some form of bias as well.

So for me "academic freedom" is in realizing where the classroom should break through its walls to allow the interpenetration of the "inside" with the "outside," and also where it should break through the confines of disciplinary knowledge towards a more proactive space. Teaching literature should not preclude one from knowing economic theory or Darwinism or cyber theory alongside Shakespeare. It is through distinctive (ex)centrism or cross-disciplinary perspectives that we supplement our role as intellectual mediators without the complacent banality of self-immured specialists. Radicals in teaching may be branded "internal foes" to the system by a self-gratifying clutch of conservatives. But these nontraditional (ex)centrist and (In)fusionist approaches to teaching spring from our awareness of disciplinary fluidity and hybridization of learning, which, in fact, should be the established order for a "thinking" classroom today.

References

Barry, E. (1973). *Robert Frost on writing*. New Brunswick, NJ: Rutgers University Press.

Barthes, R. (1977). Writers, intellectuals, teachers. In S. Heath (Ed. & Trans.), *Image-music-text* (p. 192). New York: Hill & Wang.

Barthes, R. (1985). *The grain of the voice: Interviews 1962–1980* (L. Coverdale, Trans.). New York: Hill & Wang.

Beckett, S. (1956). *Waiting for Godot*. London: Faber & Faber.

Bhatta, M. (1964). *Vyaktiviveka*. Varanasi, India: Chowkhama.

Cox, H., & Lathem, E.C. (1977). *Selected prose of Robert Frost*. New York: Holt, Rinehart & Winston.

Derrida, J. (1979). Philosophie des etats generaux. In *Etats generaux de la philosophie* (p. 43). Paris: Flammarion.

Devy, G.N. (1998). *Of many heroes: An Indian essay in literary historiography*. New Delhi, India: Sangam/Prestige.

Ghosh, R. (2000). *Elusive spark: A critical study in the poetry of Matthew Arnold and Robert Frost*. Dibrugarh, India: National Library Publications.

Ghosh, R. (2004). Reconfigurating the waiting for Godot: Explorations within some paradigms of Hindu philosophy. *Samuel Beckett Today/Aujour'hui*, 307–332.

Ghosh, R. (in press). *(In)fusion approach: Theory, contestation, limits*. Lanham, MD: University Press of America.

Kearns, J., & Newton, K. (1980). An interview with Jacques Derrida. *Literary Review, 14,* 22.

LaCapra, D. (1998). The university in ruins? *Critical Inquiry, 25*, 32–55.

Lewis, C.S. (1947). *The poetic image*. London: Cape.

Mammata. (1950). *Kavyaprakasa* (6th ed.). Poona, India: Bhandarkar Oriental Research Institute.

Marathe, S., Ramanan, M., & Bellarmine, R. (Eds.). (1993). *Provocations.* Hyderabad, India: Orient Longman & the British Council Division.

Poirier, R., & Richardson, M. (Eds.). (1995). *Collected poems, prose, and plays*. New York: Library of America.

Rajan, R.S. (Ed.). (1993). *The lie of the land.* Delhi, India: Oxford University Press.

Readings, B. (1996). *The university in ruins.* Cambridge, MA: Harvard University Press.

Ryan, M. (1982). The pedagogical imperative: Teaching as a literary genre. *Yale French Studies, 63*, 45–58.

Vamana. (1953). *Kavuyalamkara sutra vritti* (4th ed.). Bombay: Acharya Nirnayasagara Press.

Vardhana, A. (1975). *Dhvanyaloka.* Dharwar, India: Karnatak University.

Viswanathakaviraja. (1931). *Sahityadarpana* (5th ed.). Bombay: Nirnayasagata Press.

Dr. Ranjan Ghosh teaches in the department of English, Darjeeling Government College in the West Bengal Education Service, India. He will join Wroclaw University (Poland) as University Professor soon. He is widely published (with around fifty research publications) in several leading journals. E-mail infusiontheory@rediffmail.com.

Supporting learning with hands-on games and activities

Susan Catapano

Teachers are concerned with the educational value and cost of games and activities for their classrooms. They also struggle to integrate these materials with the regular curriculum. Is it possible, for little or no money, to create materials that support constructivist and active content area learning?

The answer is a resounding yes. Consider the following games and activities that were created by teachers using low-cost and free materials they collected or asked parents and businesses to donate. Letting children manipulate materials supports the development of their social, cognitive, language, and fine-motor skills. Use of hands-on materials is appropriate to support learning for students in preschool through fifth grade.

What makes a good game or activity?

Kamii and DeVries discuss the criteria of good group games in *Group Games in Early Education* (1996); their criteria can be applied to both group and individual games and activities. Here are some things to consider:

- The game or activity should provide children with something interesting to do.
- Activities should be open ended and without strict rules, and they should allow children to use their creativity to figure out how to play the game most effectively and efficiently.
- Games and activities should both challenge and reinforce learning for young children.
- Parts of the game or activity should be easy for children to perform, and parts should be more of a challenge and require new learning.
- Every game or activity that a teacher thinks about making should be played by the teacher to make sure it is developmentally appropriate and interesting from a child's perspective.
- Reviewing popular, commercially produced games and activities will give teachers good ideas for developing their own successful games and activities.
- Observing the children after introducing a game or activity will help the teacher modify or expand the game in the future.

The games described in this article are interesting because they incorporate objects and ideas that children see in their environment each day.

Environmental-print bingo and matching game

Content area: Literacy and language arts

Making the game: Collect local fast-food or business logos (stores and other places children regularly go) and create two games. Create bingo cards with the logos and laminate them. Laminate a set of individual logos on small square cardboard pieces. The teacher or a child can draw the cards one at a time out of a bag or box to call a bingo game for the group.

Individual children can draw cards to match their bingo cards. The set of cards can also be used as a matching game by turning them face down on a flat surface. Children take turns turning up two cards to try to make a match and turning them back over if there is no match.

Why use bingo and matching games? Playing bingo or lotto develops visual discrimination skills, teaches likenesses and differences, and supports turn-taking and cooperative game-playing skills. Matching games teach visual perception skills, emphasize the concepts of pairs and patterns, and develop memory and attention to details.

Assessment: Observing children using this game will determine their grasp of environmental print. Watch to see if children connect the letters to the sounds they make. Ask children to explain how they know what the name stands for and then discuss how the letters form a word. Observing the matching game will give an indication of each child's memory and ability to make connections with the materials.

Extensions:

1. Literacy and language arts: What letter sound does the fast-food restaurant begin with?

2. Literacy and language arts: Sort the cards to match the beginning letter or letter sound. Write on the back of the letter sheet the names of the cards that belong to that letter or sound so children can self-correct.

3. Mathematics and social studies: Assign students an amount of money and give them a menu for

each of the fast-food restaurants in the game. What can they buy with the money they have? For older children, require that they figure the sales tax and determine if they still have enough money.

Letter sort containers

Content area: Literacy and language arts

Making the game: Collect 26 plastic containers with lids (ask parents to bring in clean food containers). Put the uppercase and lowercase of each letter on both the lid and the bottom of the container. Collect small items such as fast-food giveaways, party favors, plastic animals or insects, and familiar items from around the house like buttons and coins. Place these items into a fabric bag or box and have children draw an item and place it in the container with the letter that the item begins with (see Photo 1).

Why use a letter sort game? It teaches sorting and classification, letter recognition, and letter-sound identification.

Assessment: This game can be used to check for letter recognition and letter-sound skills using familiar objects rather than paper and pencil. Ask the children to identify the items that begin with a specific letter or letter sound. Observe their ability to sort the materials.

Extensions:

1. Literacy and language arts: Create small laminated vocabulary-word cards. Have children sort them into the containers by the beginning letter.

2. Literacy and language arts: Put a picture of the word on the back of the cards so the children can sort by looking at the picture only and use the word to self-correct.

3. Literacy and language arts: Select five items from the game and write a story about them.

Kamii and DeVries (1996) also ask whether children can judge their own success. In other words, is the game or activity self-correcting? Allowing children to judge their own success provides motivation to continue playing the game even if it becomes challenging.

This ability to judge for themselves also fosters independence among the children and helps them develop social skills as they support one another in determining whether the game or activity has been manipulated correctly (Kamii & DeVries, 1996). The next few games allow children to play together or in groups. All the games and activities involve self-correcting materials.

Puzzles

Content area: Literacy and language arts

Making the game: Cut up greeting cards and calendar pictures to create puzzles. Laminate the pieces and create a laminated puzzle board outline for the pieces to fit on so the children can self-correct. Use a set of inexpensive greeting cards to make a progressively more difficult set of puzzles. The first puzzle should be only a few pieces, while subsequent cards are cut into smaller and more complex shapes so the children complete progressively more difficult pictures (see Photo 2).

Why use puzzles? These teach problem-solving skills, classification, and visual discrimination skills when used in small groups, and they also support social and communication skills.

Assessment: Puzzles can indicate a child's ability to make spatial connections, understand

Photo 1

Photo 2

part-to-whole, think critically, and use fine motor skills. Provide children with a variety of levels of puzzles to assess a variety of skills. Begin with simple puzzles that have clear shapes and color distinctions, and also offer puzzles where the pieces are not easily placed and that require attention to the detail of the piece to find the connection.

Extensions:

1. Social studies, literacy, and language arts: Encourage a group of children to use the puzzle pieces like a deck of cards. Divide them evenly among the children and let them take turns putting the pieces onto the board.

2. Mathematics, social studies, literacy, and language arts: Develop a game board that the puzzle pieces fit on and draw a path to follow. Have the children use dice to take turns moving along the path. On the path write how many pieces of the puzzle the child is to select and place on the board. The game can end when all the puzzle pieces are put onto the board.

Word families flip books

Making the game: Interior decorators have fabric swatch books that can provide colorful, textured surfaces on which to print beginning letters and the ending sounds that many words share. Paper can also be used to create the flip book.

Why use flip books? These support learning the beginning and ending sounds of words, discriminating between letter sounds, and blending letter sounds into words.

Assessment: Ask children to identify the word families using the flip books rather than paper-and-pencil tasks. Ask them to identify the letter sounds and blend them with the letter families while manipulating the book.

Extensions:

1. Mathematics, literacy, and language arts: Create a set of cards for each word that is in the flip book. Have children draw from the card pile and then make the word from the flip book.

2. Literacy and language arts: Clip the beginning-sounds pages or fabric swatches together, and then, using the ending sound of the word families, have the child flip through the book and make a list of letters that can be added to the beginning of the sound to create a word.

Sand or salt letters

Making the game: Use a set of stencil cutouts to create textured letters. Place the stencil on a card, brush glue in the cutout section (you can trace around the letter and brush the glue inside the traced lines), and cover the glue with salt or sand. To color salt, use chalk and a dish. Rub the chalk into the salt and the color will come off into the salt. After the letters dry, children can trace the letters with their fingers.

Another variation of this activity is to have a tray or a cardboard box with low sides that contains about an inch of salt or sand. Create a deck of alphabet cards, both uppercase and lowercase. Have children draw a card and trace the letter on the card in the salt tray (see Photo 3). (Caution: Alphabet cards can be created on the computer; however, the format of the letters can be difficult to control. Use of a variety of fonts may be necessary to get an appropriate lowercase A and G.)

Why use sand or salt to teach letter formations? As developed by Maria Montessori, the use of sand or salt letters provides a multi-sensory experience in learning the letters: hearing them, seeing them, and feeling them. By feeling the sand letters or tracing letters in the tray, the child begins to connect the letter to writing, which leads to developing handwriting skills (Gettman, 1987).

Assessment: Ask children to form specific letters in the salt or sand. Use this method in place of paper-and-pencil tasks to assess letter recognition and letter formation. Extend this assessment

by asking children to draw the letter that has a specific sound. This assesses letter sound and letter identification correlation. This activity can also identify or support children with sensory integration disorders.

Extensions:

1. Mathematics and literacy: Use the alphabet card deck to play a matching game. Have children turn cards over and match uppercase with lowercase letters. For younger children, have them match only uppercase or lowercase letters.

2. Literacy and language arts: Have children write words in the salt or sand after they have mastered letter formations. Create a deck of sight words or vocabulary words. Have the children draw a word from the deck and write the word in the sand or salt. The children can self-correct by looking at the written word on the back of the card.

Another consideration when preparing games and activities for the classroom is whether all the children participate actively throughout the game. Although learning to wait for a turn is positive support for developing social skills, the game should allow for equal and continuous participation. Again, the value and amount of participation must be judged from a child's point of view. Turns must come to an end, and one child must not be allowed to dominate the game. Allowing children to help make up the rules provides for the greatest amount of active engagement in the game. Also, from a child's perspective, the rules of the game can change as long as all players agree on the changes (Kamii & DeVries, 1996). Board games are effective tools to review concepts and make sure all the children playing the game are involved.

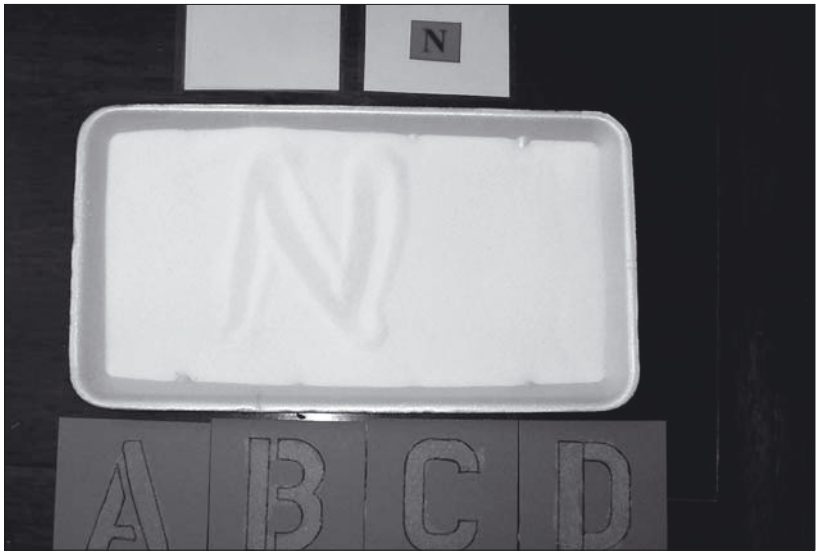


Photo 3

Board games

Making the games: Using various sizes, colors, and types of posterboard or cardboard, draw a path for children to move game pieces along. Create decks of cards, or use the ones in the games previously described, to give the children direction on how to play the game. Signs on the path can also give direction. Children can use dice or the draw of the cards to get from the start of the path to the ending (see Photo 4).

Why play board games? Children get practice in counting, matching items drawn from the deck, letter recognition, and communication skills as they discuss strategies and experiences with the game. (The board game should reflect the skills the teacher wants to support in the children.)

Assessment: Create board games to cover any set of skills or knowledge that is in the curriculum. Put facts, skills, or knowledge to be learned on the cards in the draw pile. Observe the children rolling dice, answering the questions on the cards (assessing reading and recall), and moving (assessing a math skill) along the path of the game.

Extensions:

1. Mathematics, language arts, and social studies: Invite children to make up the rules for the game.

2. Mathematics, language arts, and social studies: Invite children to make their own games to play with one another or with their parents. This is an excellent project to culminate in a classroom game night, during which the children can demonstrate games to their parents.

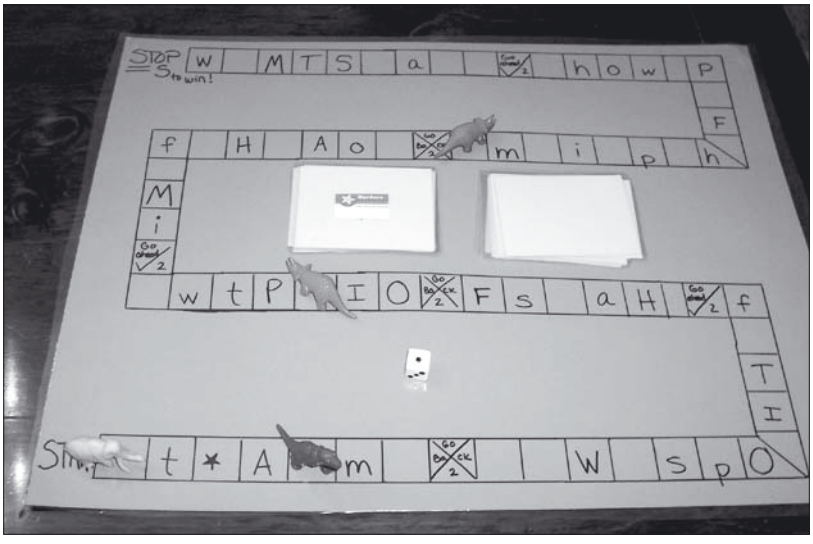


Photo 4

Things to keep in mind

As part of the teacher education program at my university, students are required to make activities and games to place in learning centers during their field-based experiences. They are told to make at least two of every game or activity. Having a second copy available can avoid issues of sharing among young children and making them wait for a popular game or activity. They are also told to be sure they make at least two sets of the pieces used in each game or activity, because small pieces get lost and the entire game or activity can become useless if one piece disappears.

Students in the teacher education program are also encouraged to develop several versions of the same game or activity so that they can use the same pieces with multiple games and activities. One former student has a box with a variety of dice, playing pieces, and matching cards that she offers children in her preschool classroom. The supporting pieces all work with several different board games. Children can trade in the dice or playing pieces for other sets and continue to play the games throughout the day. She also has sets of playing pieces collected from toy counters or fast-food toy giveaways that children can elect to use. Here are things to keep in mind when making games and activities:

1. Make two sets of every game or activity and multiple sets of pieces.

2. Assemble materials and make several games or activities at the same time. Keep materials in a plastic box for organization and easy access.

3. Make sure glue and other materials used are safe for children. White school glue and water-based markers are safe to use.

4. Cover everything with either clear contact paper or laminate with a cold or hot laminator.

5. Collect materials as they become available, and have a place to store them. Make games and activities on a regular basis to use the materials that have been collected.

6. Begin the school year by sending home a list of items that parents can donate to the classroom for making games and activities. Here are some items to put on the list: foam trays, sponges, plastic containers, paper products, leftover scraps of plastic or metal, paper, envelopes, cardboard, date stamps, tape, and cards.

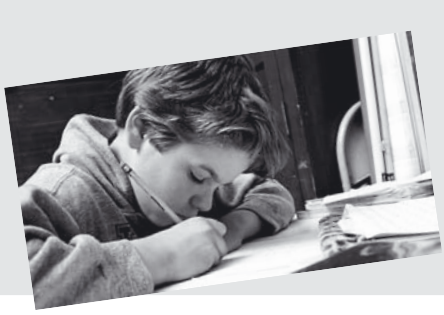
7. Encourage teachers to share a game or activity with other teachers. An effective teacher inservice day can be spent with teachers working together to make games and activities that all can share.

8. Set up a system to organize, store, and use the games and activities. Teach children to use the games and activities appropriately. Determine how materials are to be used and shared.

When using recycled materials for classroom games and activities, the teacher should make sure that the items are clean, anything that held a chemical is thoroughly washed, there are no sharp edges or parts that will come off, and pieces used by young children are too large to swallow and contain no toxic materials (Redleaf & Robertson, 1999).

Some final thoughts

Consider whether the game or activity should be played individually or with a group. The answer is often both. The time and effort required to create games and activities make it necessary to think of all the ways that a game or activity



can be played. While concern for over-individualizing education (Kamii & DeVries, 1996) has raised the question of whether there is an opportunity to develop social skills if children do not interact, games and activities should be created to be used in both ways.

The realities of the school climate today require that children spend a lot of time working individually, due to the philosophy of the teacher, the focus on standards and testing, or the need to maintain control in the classroom. Children also need to interact in small groups and work with manipulatives or play games. Sometimes these types of activities are saved for rainy days or Friday afternoons rather than used throughout the week. Piaget stressed the importance of the social interaction between children for appropriate overall development by stating that without regular social interaction, children will have a hard time constructing their logical skills, as well as their social and moral values (Kamii & DeVries, 1996).

It is important for teachers to include hands-on games and activities in curricular units, lesson plans, and daily classroom work as a way to meet the needs of all learners. Hands-on, interactive materials teach and support the learning of skills and knowledge with the content areas. Teachers must be comfortable with the educational value of the game or activity to be able to justify the use of the materials in their classrooms. Teachers must also be able to explain the educational purpose and use of the games and activities to parents and administrators.

Games and activities support language learning by providing children with an opportunity to discuss the game and to interact, through communication skills, throughout the game. Manipulation of the pieces of the activity or game can reinforce written language learning. Counting, matching, and aligning items within the game or activity support mathematics learning. Taking turns and having conversations about rules and procedures provide the opportunity to enhance social skills. Although children will readily participate in most games and activities that are presented to them, justification is necessary to make sure the games and activities are meaningful and purposeful. As Katz (1997) has said, "Just because children can do something doesn't mean they should do it."

Getting materials

The University of Missouri–St. Louis has a teacher resource center (TRC) that is part of the St. Louis Teachers' Recycling Center (SLTRC). Through partnerships with local businesses, SLTRC stocks the shelves of the TRC with items that businesses usually throw away and that end up in landfills. These items include paper rolls, plastic punchouts, fabric, paper, and sheets of plastic. The treasures that preservice and inservice teachers find in the TRC help provide them with ideas and materials to create hands-on games and manipulatives. Offering the materials to children for open-ended, unstructured play provides creative opportunities to build structures that can be used as ongoing projects that integrate all content areas.

Although few places offer such a rich resource as a center so fully stocked with materials, there are many ways to provide games and manipulatives made from inexpensive or free materials. The activities in this article use common items found in the university TRC and can be made from materials that are collected by teachers and parent/teacher organizations. A call to parents and businesses in the area of a school will turn up plenty of materials that usually find their way to the trash.

References

Gettman, D. (1987). *Basic Montessori: Activities for under fives.* New York: St. Martin's.

Kamii, C., & DeVries, R. (1996). *Group games in early education.* Washington, DC: National Association for the Education of Young Children.

Katz, L. (1997, April). *Project work in the early childhood classroom*. Paper presented to a community meeting at Southern Illinois University, Edwardsville, IL.

Redleaf, R., & Robertson, A. (1999). *Learn and play the recycle way.* St. Paul, MN: Redleaf Press.

Susan Catapano teaches early childhood education courses at the University of Missouri–St. Louis, St. Louis, Missouri, USA.
E-mail catapano@umsl.edu.

Strategic Moves

Avoiding the "fourth-grade slump"

William G. Brozo

Thirty years ago, when I first entered the field of reading education, everyone was talking about the so-called "fourth-grade slump." It was thought that as children in the early grades move from a familiar diet of narrative text to confronting an increasing regimen of informational, disciplinary text in the later grades their motivation and achievement decrease. Today concern about the fourth-grade slump is as strong as ever among education scholars in the United States (Cummins, 2001; McCray, Vaughn, & Neal, 2001; Snow, 2002).

There is strong evidence to suggest the slump is not restricted to U.S. children. A close look at the results from international reading literacy assessments indicates that achievement levels in several countries declined for students from age 10 to age 15. In Sweden, for instance, 10-year-olds ranked first among all participating nations on the Progress in International Reading Literacy Study (PIRLS; Mullis, Martin, Gonzalez, & Kennedy, 2003), yet Swedish 15-year-olds dropped in ranking to ninth on the Programme for International Student Assessment (PISA; Organization for Economic Cooperation and Development, 2001). Similar declines were witnessed for England, Italy, Germany, Greece, the Russian Federation, and the United States. In fact, only 4 of the 14 countries that participated in both international assessments saw an increase in ranking from PIRLS to PISA.

To help students avoid a slump in motivation and achievement as they make the transition from childhood to adolescence, teachers need strategies designed to engage and sustain effort. Here are three guiding principles along with classroom strategies derived from the literature on reading and learning engagement (Guthrie & Humenick, 2004; Guthrie & Wigfield, 2000), as well as teacher observations.

Principle 1: Balance teacher and student-centered learning

Many school-based activities that delight young learners—activities that combine play with learning, allow for discovery and freedom of movement, and involve direct experience—derive from an understanding of the cognitive and motivational needs of children. As students progress through the grades, however, slowly but inexorably instructional features that made learning fun become rare. Yet evidence suggests that older students continue to desire and benefit from approaches to learning that are dynamic and linked to what they enjoy (Brozo & Simpson, 2003; Sturtevant, Boyd, Brozo, Hinchman, Alvermann, & Moore, in press). What is more, older students are quite capable of articulating conditions that make learning more pleasurable and successful for them (Cook-Sather, 2002; Lee, 1999).

When Elizabeth (all names are pseudonyms) asked her students to respond to a confidential questionnaire about the format of instruction in her economics class, she was surprised to learn that many disliked listening to lectures every day. She then invited suggestions for changing the instructional format and received several ideas, such as (a) allow more group work, (b) give students a chance to teach one another, (c) provide more hands-on experiences, and (d) let students find and create their own examples. These recommendations led to a project Elizabeth designed for a unit on interest rates that asked her students to find a partner and go into the community to interview a bank official. They were also asked to obtain from the bank any brochures or flyers on its personal lending products and bring them back to the classroom. Once these materials were compiled, Elizabeth distributed them and asked students to work in groups to compare and contrast interest rates.

Principle 2: Expand student choices and options

Choice may be one of the most critical elements of motivation (Turner, 1995). As students enter preteen and teen years their choices about many things outside of school increase significantly, yet options in school remain limited. For instance, teachers may require students to answer a question in only one way or read only the assigned texts.

To motivate his biology students, Karl allows them as much freedom of choice as possible. For example, when studying the topic of ecosystems, his students were asked to compile a collection of related readings from various sources, including popular magazines, newspapers, informational books and novels, and websites. Students could choose their own

approach to presenting to their classmates the readings they found. Some gave traditional front-of-room presentations, others created colorful PowerPoint slides, and still others had their fellow students interact with the materials and report what they learned.

Principle 3: Exploit the social nature of learning

It seems abundantly clear that learning occurs for children and youth as a result of the various overlapping influences in their lives (Gee, 2000). All who interact with youth—family at home, friends in the neighborhood, teachers and classmates at school, coaches and teammates on the athletic field, and even shop owners and clergy—contribute to their funds of knowledge. Teachers can take advantage of the fact that learning is a social phenomenon as much as a cognitive one by creating opportunities for students to work together to solve problems, conduct research, collaborate on compositions, and participate in role-plays and debates. These approaches may be especially important to youth who seem to have a strong desire for group affiliation.

Svetlana's term projects in math were of higher quality when she allowed students to work together to produce them. Three students in her class who were on the school's soccer team compiled a scrapbook of the team's performance, including statistical charts of group and individual performances, newspaper clippings, and summaries of how math concepts and applications were used in their project.

A final word

Keeping youth motivated to read and learn so they avoid a slump in achievement will be a constant challenge for educators. While there are no foolproof approaches, teachers may be more successful if they place students at the center of learning, allow them more choices and options, and create opportunities for them to learn with and from others.

References

Brozo, W.G., & Simpson, M.L. (2003). *Readers, teachers, learners: Expanding literacy across the content areas.* Upper Saddle River, NJ: Merrill/Prentice Hall.

Cook-Sather, A. (2002). Authorizing students' perspectives: Toward trust, dialogue, and change in education. *Educational Researcher*, *31*, 3–14.

Cummins, J. (2001). Magic bullets and the grade 4 slump: Solutions from technology? *NABE News*, *25*, 4–6.

Gee, J.P. (2000). Discourse and sociocultural studies in reading. In M. Kamil, P. Mosenthal, P.D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 195–207). Mahwah, NJ: Erlbaum.

Guthrie, J.T., & Humenick, N.M. (2004). Motivating students to read: Evidence for classroom practices that increase reading motivation and achievement. In P. McCardle & V. Chhabra (Eds.), *The voice of evidence in reading research* (pp. 329–354). Baltimore: Brookes.

Guthrie J., & Wigfield, A. (2000). Engagement and motivation in reading. In M. Kamil, P. Mosenthal, P.D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 403–422). Mahwah, NJ: Erlbaum.

Lee, P.W. (1999). In their own voices: An ethnographic study of low-achieving students within the context of school reform. *Urban Education*, *34*, 214–244.

McCray, A.D., Vaughn, S., & Neal, L.I. (2001). Not all students learn to read by third grade: Middle school students speak out about their reading disabilities. *Journal of Special Education, 35*, 17–30.

Mullis, I., Martin, M., Gonzalez, E., & Kennedy, A. (2003). *PIRLS 2001 international report: IEA's study of reading literacy achievement in primary schools in 35 countries*. Boston: International Study Center, Boston College.

Organization for Economic Cooperation and Development. (2001). *Knowledge and skills for life: First results from PISA 2000*. Paris: Author.

Snow, C. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. Santa Monica, CA: RAND Education.

Sturtevant, E., Boyd, F., Brozo, W.G., Hinchman, K., Alvermann, D., & Moore, D. (in press). *Principled practices for adolescent literacy: A framework for instruction and policy*. Mahwah, NJ: Erlbaum.

Turner, J. (1995). The influence of classroom contexts on young children's motivation for literacy. *Reading Research Quarterly*, *30*, 410–441.

William G. Brozo is Professor of Literacy in the Graduate School of Education at George Mason University in Fairfax, Virginia, USA. E-mail wbrozo@gmu.edu.

Index
Thinking Classroom, Volume 6, 2005

Departments

Look Who's Talking

Pros and Cons

Strategic Moves

Teaching Tips

Features

Authors

Subjects

Writing for *Thinking Classroom*

Thinking Classroom (also published in Russian as *Peremena*) serves as an international forum of exchange among teachers, teacher educators, and others interested in democratic teaching practices. It seeks to encourage professional development, research, and reflection. Authors are invited to submit articles that focus on active inquiry, student-centered learning, alternative assessment, and other aspects of educational change. Due to the international nature of the journal, articles should address issues that appeal to a wide audience, and terms or examples that are specific to a particular country or region should be explained in the text.

Thinking Classroom strives to maintain a balance of practical and theoretical information. The writing should take the form of a narrative, rather than a formal research report. Examples from classroom experience, quotations from colleagues or students, or examples of students' work can help communicate ideas to journal readers.

In addition to original submissions, *Thinking Classroom* will consider for publication articles that have appeared previously in national journals with limited circulation, to present these works to a wider international audience.

Format for Submissions

- Submissions are accepted in English or Russian.
- Articles should not exceed 4,000 words in length.
- Articles should be submitted electronically as an e-mail attachment at **thinkingclassroom@ct-net.net**.
- The full name(s) of the author(s) should be included on a cover sheet, but this information should not appear in the body of the manuscript, as submissions are reviewed anonymously. The cover sheet should also include complete author contact information (**postal address and e-mail address**).
- References to articles or books cited must be complete. For journal articles include author, date of publication, title of article, title of journal, volume number, and page numbers (where article appeared). For books include author, year of publication, title, location and name of publisher. Additional details and examples can be found online at http://owl.english.purdue.edu/handouts/research/r_apa.html
- If an article includes samples of writing or artwork produced by students, the author of the article must obtain written permission for their use. Likewise, if photographs are submitted to accompany an article, written permission must be obtained from both the photo subjects and the photographer. (A parent or guardian must give permission for use of a child's photograph or schoolwork.) Permission forms in English and Russian may be downloaded from the website at www.rwct.net or www.ct-net.net.
- The editors rely on a system of anonymous peer review to help them select articles for publication.
- Letters to the Editor and other submissions and correspondence should be sent to **thinkingclassroom@ct-net.net**.

Permission to use materials from *Thinking Classroom*

Quotation: Authors may quote portions of *Thinking Classroom* text up to 500 words in length. To quote a longer text, or to reproduce graphics, an author must obtain written permission.

Photocopying: Photocopying is permitted for nonprofit one-time classroom use or library reserve use in an educational institution. For repeated classroom use, or use of copies in a student coursepack, please, apply for written permission.

Reprinting and Translating: Reprinting any text from *Thinking Classroom* longer than 500 words, in its original language or in translation, requires written permission and inclusion of the copyright notice (© Thinking Classroom, volume…, number…, year). For use of articles or graphics reprinted with permission from other sources permission must be obtained from the original publisher of the item.