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Cognitive structures help students learn how to learn

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It would be great if students learned everything they were taught at every grade level, but we all know there are many struggling students in middle school and high school who still don't have the basic knowledge and skills they need to be successful. What can we do when we have so many students and so much content to teach?

By taking a different perspective, teachers can use everyday lessons to help students develop more effective cognitive structures to learn how to learn so they can make sense of what is taught. However, we first have to understand what *cognitive structures* are and how they function. The basic cognitive structures compare bits of data to process information for meaning. For example, when we are confronted with unfamiliar information even as adults, the first thing we try to do is recognize something about it that fits with prior knowledge and experience. When we ask students, "What do you notice?" we are asking them to connect unfamiliar with familiar data. Too often, we assume students are using the cognitive structure of *recognition* to do

this. For example, when presenting a new concept in math, first ask students to look at a problem, ask them what they see/notice and then ask, "What part do you know for sure?" Instead of having one or two students raise their hands and respond, have all your students do a quick pair/share and ask each other these questions so they all are engaged.



Security is mostly a superstition. It does not exist in nature nor do the children of man as a whole experience it. Avoiding danger is no safer in the long run than outright exposure. Life is either a daring adventure, or nothing.

—Helen Keller



We would like students to remember what they are taught, but they tend to use short-term memory to give us what we want them to say or do, usually imitating what we presented. The cognitive structure of *memorization* enables students to process information by breaking it down into component parts and integrating it with their knowledge base. This kind of processing provides multiple ways to access, recall and use information in many different contexts.

Integrating and processing information for understanding requires students to compare how bits of data are alike and different by using the cognitive structure of *conservation of constancy*. We all studied how Piaget demonstrated conservation by pouring the same amount of water from a short wide glass into a tall narrow glass. He said children should have acquired this structure by the time they are seven or eight years old so they can easily identify what changed and what stayed the same—for example, the amount/volume of the water stayed the same but the shape of the container changed. Because many of our students are coming to us without the play experiences that allow them to experiment with manipulating physical variables and the reflective awareness to ponder or notice what happens, they have not developed effective use of this structure. For example, when explaining regrouping in math, focus on what changed and what stayed the same rather than just

learning the operation. When teaching the relationship between fractions, decimals and percentages, don't assume the students can see what changed and what stayed the same.

Classification is another basic cognitive structure that compares information to identify relationships of parts to each other and parts to the whole. This structure is essential for integrating and processing information. We use it to identify criteria and characteristics that qualify something as a member or nonmember of a set—what goes together and why. For example, in social studies, what makes a country a country; in science, what molecular structures are characteristic of carbon compounds; in language arts, what criteria identify parts of speech, tense, number, genre of literature and so on.

Temporal and spatial orientation are two cognitive structures that compare bits of data in relationship to when and where things happen. These structures are essential for planning and organization. For example, understanding the historical time frame and location of a significant invention, medical breakthrough or piece of literature provides contextual references to enhance meaning. Keeping schedules, meeting deadlines, sequencing step-by-step procedures and managing use of time all require temporal orientation. Giving and following directions; keeping order; and awareness of distance, location, direction and perspective all need spatial orientation.

Metaphorical thinking is a cognitive structure that enables us to think outside the box by comparing bits of information that appear dissimilar but help us to create insights and original thinking.

When we have these basic cognitive structures, they operate so automatically that we are not even aware of them. It is difficult for us to imagine what it is like for students who do not have them. Those who don't have them don't know they don't have them—things are just hard and confusing. Without effective cognitive structures, students often drop out of school mentally as early as third grade. They survive the upper grades by trying to do just enough to get by or memorizing to pass tests. We invest lots of time and money to help them learn without realizing that we first have to help them develop the cognitive structures they need to learn how to learn.

Here are a couple feedback comments from administrators who participated in my seminar at last spring's ASCD international conference. "Such a missing piece and new perspective! Immediately could see kids who are missing these pieces—thanks!" "Oh my gosh! Thank you so much! I am going to plan my next staff meeting around learning and teaching to begin this work." "All of this makes sense as far as how we process and display information. I need to share your book/ideas with my staff to create synergy for student learning."

More information is available in Garner's book, *Getting to Got It!—Helping Struggling Students Learn How to Learn*, and at the ATA's Educational Leadership Academy (ELA), to be held in Banff, July 9–13, 2012.

If you would like to register for ELA, contact Leslie Kaun at 780-447-9410 (Edmonton) or 1-800-232-7208 (elsewhere in Alberta); e-mail: ELA@ata.ab.ca.

What does CTF do for Alberta teachers?

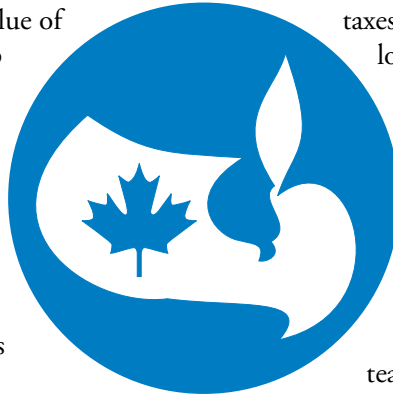
Calvin Fraser, Secretary General, Canadian Teachers' Federation

It is natural for teachers to question the value of CTF to them since the federation is one step removed from direct service to teachers. So, what does CTF do for you as teachers in Alberta?

1. Coordination of knowledge and activities:

CTF acts not only as a clearinghouse to share material among member organizations (MO—ATA is one of 16), but also provides both analysis and impact to MO work. Our research analysts draw out interactions that benefit all and, through contacts with many national organizations, spread teacher values and teacher-based information in ways that will garner support and value for teachers.

- ## 2. Influence on directions in education:
- Many bad ideas that originate outside of Canada or in powerful national organizations (eg, the Fraser Institute) affect education in every province. CTF monitors and influences the impact of these ideas through its involvement with other groups (eg, Conference Board of Canada). CTF also is proactive in working with national groups around the world to head off or divert bad ideas. We currently are working directly with the National Education Association (NEA [3.2 million members]) and the American Federation of Teachers (AFT [1.7 million members]) to reverse the information flow from the United States to Canada by sharing the many strong positive practices of Canadian teachers. This work is beginning to show success.
- ## 3. Advocacy:
- CTF lobbies the federal government on matters of direct interest to teachers that are governed by federal influence—matters such as



taxes, copyright and criminal allegations. One long-standing campaign has been to protect educational access to published information (especially from the Internet) for classroom use. Despite strong lobbying from the corporate sector to cut off educational access, every version of the copyright act to date has maintained the special status for education. Another success has been maintenance of the section 43 protection for teachers in the Criminal Code of Canada.

Other campaigns continue. Expect to see a new effort in the coming year to protect teachers from the current injustices of the criminal record check procedures.

- ## 4. Solidarity is priceless:
- There are many societal interest groups who choose to subvert public education to private interests; insert corporatism into pedagogy; restrict pensions, unemployment insurance and health benefits; control or profit from assessment; press for unfair evaluation practices; and a host of other goals contrary to teacher interests and values. Through CTF, Canadian teachers maintain common vocabulary, shared views and a joint focus to protect us all.

- ## 5. International representation:
- CTF gives Canadian teachers a strong voice on the world stage in opposing the spread of such things as public-private partnerships (PPPs), the creep of institutional assessment and the influence of the International Monetary Fund (IMF) and World Bank. Canadian teachers are active and forceful in this forum. BCTF, which withdrew from CTF, has no voice on the world stage and no ability to participate. In a global economy an international voice is increasingly important.

What does the CTF do for Alberta teachers?

- Coordinates knowledge and activities
- Influences the direction of education
- Advocates for teachers and for the profession
- Promotes solidarity
- Provides international representation
- Provides international service

6. **International service:** CTF Project Overseas and Interaction projects with other countries either jointly with a member organization (Alberta has several projects) or directly through CTF create rewarding and life-changing experience for both the Canadian teachers involved and the overseas partners. Most of the ATA overseas work is through or with CTF. By working through CTF, member organizations maximize the impact of their funds, redundancy is eliminated and value is enhanced.

CTF is a small organization—much smaller than ATA, for example. Direct service to members is provided by the provincial organizations. CTF provides support and service to the MOs based on priorities set by the CTF board of directors on a three-year basis. Key tools include the following:

1. **Networking at the political and staff levels:** bringing the presidents and general secretaries from 16 member teacher organizations together three times each year permits opportunities for planning, discussion and coordination of action that benefits every teacher in Canada—yes, even the nonmembers.

Bringing the staff from across Canada together once each year permits operationalizing the shared goals. We are all familiar with the tyranny of the immediate and the intense work required within the province, which makes these national meetings so important as a way to see how each situation is part of the larger picture and how actions in one province can and do affect others. These meetings are supplemented by national seminars on pensions, employment insurance and other critical topics. This

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- **Creation of powerful national statements for MO use**
- **Lobbying**
- **Relationships and partnerships with national organizations**
- **Relationships and partnerships with global organizations**
- **Publications**

summer will see the fourth annual CTF President's Forum, which will explore education reform and will involve participation from OECD, CMEC (Council of Ministers of Education, Canada), and teacher unions from the USA, UK and elsewhere.

2. **CTF research creates powerful national statements for MO use:** recent examples include identification of teacher contributions to their classrooms (average \$453 per teacher per year) and how teachers use their summers for professional growth. This information is arrived at through polling, focus groups and other research tools. CTF also works with MOs to share research and pulls together common threads and analysis to avoid duplication and redundancy. Watch for a release this summer of a joint research publication that will expand the value of your organization's research in conjunction

with all others. A members-only part of the CTF website provides every MO with instantaneous access to vast amounts of information from collective agreements, pension agreements, private research and countless professional interest topics as well as the ability to compare and contrast information locally, between provinces and/or nationally.

3. **Lobbying:** CTF provides briefs and makes appearances before numerous committees from such entities as the federal Justice Department, Heritage Canada, HRSDC, the House of Commons and the Senate. Our annual Hill Day provides opportunity for all of our provincial organization members to influence the thinking of members of parliament and senators. This is proving to be increasingly effective and CTF solidarity contributes heavily.

4. Relationships and partnerships with national organizations:

CTF works with numerous national organizations including heritage-related groups (SEVEC [Society for Educational Visits and Exchanges in Canada], Assembly of First Nations, Terry Fox Centre, Canadian Museums

Association, etc); language-related groups (Official Languages Commissioner, Canadian Association of Second Language Teachers, Canadian Association of Immersion Teachers, Canadian Parents for French, Canadian Association of Francophone School Boards, Canadian Association of Francophone Parents, etc); health-related groups (Public Health Canada, Canadian Mental Health Commission, etc); and lobby and special-interest groups (Conference Board of Canada, Canadian Council on Learning, etc). The complete list of partners is exhaustive. The reach of all our work is enhanced by being national—in one example, several different provinces were spending millions of dollars on work to counteract cyberbullying in efforts that were excellent but localized. CTF involvement in the issue created a national impact for local work.

5. Relationships and partnerships with global organizations:

Education International (EI) is the global teacher union. CTF has representation on the EI executive board and is active and influential in virtually all key decisions. The quadrennial World Congress is this year and CTF will be voicing strong positions against the pervasive spread of international testing. CTF is a strong part of the Commonwealth Teachers' Group (53 countries) and the



Comité Syndical Francophone de l'Éducation et de la Formation (CSFEF—every major francophone country). We have strong working relationships with other teacher and education-related unions, notably from the United States (NEA, AFT), United Kingdom (National Union of Teachers [NUT]) the Caribbean (Caribbean Union of

Teachers) and many African countries (Uganda, Ghana, Guinée, Senegal, etc). These partnerships give Canadian teachers a strong international voice. Through the Public Education Network in Canada, three to four times each year we share information and updates with many other national education-related labour groups.

6. **Publications:** CTF print and Web publications are popular and powerful at spreading teacher values. They are used in university classes, with other national organizations and to coordinate teacher values within MOs. Effective use of the CTF website has expanded the reach of publications as a way to share research, such as the recent input from teachers in Aboriginal schools. CTF publications are popular also for sensitive issues such as the GLBTT publications that continue to be strong sellers. Most publications are available free of charge on our web site.

In brief, CTF adds value to the service that Alberta teachers get from their own organization and offers a layer of protection at a high level of interaction. At a time when recognition of the special expertise of teachers and even the influence of teachers within the system are being challenged by powerful multinational organizations, teachers and teacher organizations are getting great support from CTF.

To find archived issues of *Leadership Update*, go to www.teachers.ab.ca and click on Other Publications (under Publications), then go to School Administrators.

Feedback is welcome. Please contact Konni deGoeij, associate coordinator, administrator assistance, Member Services, at konni.degoeij@ata.ab.ca.



Q & A
GORDON THOMAS
Executive Secretary

Q. On February 8, 2012, Education Minister Thomas Lukaszuk made statements to the media about the failure of discussions between the government, the Alberta Teachers' Association and the Alberta School Boards Association on achieving a settlement in advance of the provincial budget. Could you clarify his comments and explain what they mean for our collective agreements?

A. Lukaszuk laid responsibility for the failure of the discussions at the feet of Alberta teachers. However, the discussions were tripartite, which means that they involved three parties: school boards, through the Alberta School Boards Association (ASBA); the Alberta Teachers' Association; and the Government of Alberta.

Lukaszuk stated that "the face time that children have with their teachers is non-negotiable. So our position on behalf of the children is that we want to make sure that there is no diminished learning time." He further stated that he did not see an agreement being possible "until such time that ATA chooses not to negotiate teaching time." In fact, in these tripartite discussions, teachers have been talking about teacher workload, not teaching time. Teachers would like reasonable limits on the workload that is being imposed upon them. Their goal is to ensure that they have adequate time to prepare for their core work: to teach and to respond to the complex needs of individual students.

In the discussions that have taken place since September, teacher representatives have offered many suggestions to limit workload in ways that would not cause additional cost. School boards would continue to have latitude to determine teacher instructional time in accordance with the standards set by the province in its *Guide to Education* and in accordance with collective agreements. Of course, if a board chooses to have teachers devote more time to instruction, it would have to reduce other noninstructional duties it assigns. Boards have been able to manage such limits effectively without compromising student instruction; currently, there are restrictions on teaching time in jurisdictions serving 62 per cent of Alberta's students.

The minister's blaming teachers for the breakdown of the talks while ignoring the ASBA's refusal to discuss workload issues and government fiscal constraints is a misrepresentation of the history of these discussions. With these comments Lukaszuk has ignored the significant concessions Alberta teachers were willing to make to help the government achieve long-term stability and labour peace in the province's education system.

Lukaszuk also said, "The numbers in the [provincial] budget will reflect our final offer to teachers for the next three years." This statement invites confusion about the role of the provincial government in teacher collective bargaining. Teachers bargain with their individual school boards. The province, as the sole funder of education, has considerable influence over and interest in the outcome of collective bargaining, which is why the ATA and school boards have been discussing creating a framework within which such bargaining would occur. It is not the role of the province to make a "final offer" in the budget, and its doing so undermines the prospects of a negotiated framework agreement.

In the absence of a provincial framework agreement, teachers and their employing school boards will engage in collective bargaining to settle agreements for a period of time beginning on September 1, 2012. Without a tripartite agreement, all issues will be on the table, including teacher workload, assignable time and instructional time, as well as salaries and benefits.

The Association is willing to continue to work with the minister to achieve a tripartite agreement.

I welcome you to monitor the provincial website (www.teachers.ab.ca) for updated information.