Problem Solving

in Second-Language Teaching

Caterina Cicogna
Marcel Danesi
Anthony Mollica

Reinforcing Language Skills Through Problem-Solving and Pencil-and-Paper Activities

Anthony Mollica
Brock University

*T*he correct solution to a riddle brought about the destruction of a monster and the liberation of a city in ancient Greece. It also brought immediate wealth, power, and fame to the solver but - alas! - at the same time it was to start a series of tragic revelations which ultimately caused the personal downfall of the quick-thinking Oedipus.

Let me hasten to assure the readers that neither the problem-solving activities which I am about to suggest for your enjoyment nor the solutions which you will propose will bring about any dire consequences.

Teachers of mathematics will be quick to recite a whole litany or reasons as to why problem-solving should be introduced in their classroom.

Problem-solving is
1. a basic skill
2. exciting and challenging
3. an opportunity to individualize
4. a chance to synthesize knowledge
5. an opportunity to think.

Problem-solving requires thinking. Although there is only limited understanding as to how the brain actually works, there is a general agreement that anybody regardless of his/her background can improve the way in which he/she handles information or generates ideas. In other words, we could all learn to

think better. Thinking, then, is a skill; one which requires the use of our brain and the conscious application of certain mental «tools» which facilitate the process we call thinking. Many of these so-called tools we know and use everyday.

Good thinking, like any other skill, requires practice, and the use of these cognitive (or thinking) tools will require a lot of regular practice. It is rather like learning to type or drive a car. At first, the moves seem awkward and you must maintain constant attention to each step. Eventually the process becomes part of a pattern and you can easily move through the motions.

All students - no matter what their academic abilities - can think. Problem-solving builds on this fact. By appealing directly to what they can do, problem-solving brings in language skills such as speaking, reading and writing as an indirect process. To solve the creative and logical problems - which the students can do, and want to do - they must read, understand, speak, write. Needless to say, the problem-solving activity should be so structured so that the early problems require a very basic reading comprehension ability.

Problem-solving is not only the *negative* things we have to deal with but they stand for challenges and opportunities. In fact, any time we are going to sit down and «think about» something - whether it is contemplating about our own future actions or buying a gift - we are involved in problem-solving. (Figure 1).

Figure 1

The human mind is an incredible piece of equipment - not a machine - but a living, growing, information processing system which has allowed us to develop our complex culture.

Both teachers and curriculum documents would like to emphasize and promote problem-solving. The Ontario Ministry of Education, for example, considers problem-solving to be part of the «basic skills fundamental to a child's continuing education», specifically,

> [...] the ability to apply rational or intuitive process to the identification, consideration and solution of problem. Such individual should develop skills of inquiry, analysis, syntheses, and evaluation. Children who acquire such reasoning skills will be able to continue learning throughout their lives.(Ministry of Education, 1975:6).

Unfortunately, this emphasis on problem-solving in statements and objectives is not reflected in program practice. A recent survey of classroom practice in the teaching of Mathematics in the elementary school clearly indicated that the emphasis in the classroom is on the development of computation and other mechanical skills, rather than on the development of problem-solving activities.

But what constitutes good problems? Good problems:

* entail concepts, content, or processes in the solution process or results that are worth consideration
* cause the learners to synthesize what they have learned
* involve obstruction to solution which are manageable and within reach of the solvers while still presenting them with a challenge
* contain intrinsic motivation features that intrigue or stimulate the learners to desire the solution
* offer the opportunity for extension of the problem
* permit more than one means of solution
* place the learners in creative, interesting, or stimulating situations
* ask the learners to make use of more than one skill at a time
* provide opportunities for verification of the result
* are not purposefully misleading.

What qualities must the good problem solvers have in order to succeed in their task? Good problem solvers:

1. Are quick to understand the important features of a problem, in particular the objective;
2. Initiate their approach to problems with less anxiety and more certainty that they will be able to reach a solution, than do other problem solvers;
3. Can transfer their learning from one solved problem to similar problems;
4. Are able to evaluate and select from alternative solution routes;
5. Estimate and approximate well, and, when they get solutions, check to see if they are reasonable; and
6. Learn from their mistakes and when answers do not check out, determine why they are not reasonable.

Drawing from several sources (Dodson, 1971; Hollander, 1974; Kruteskii, 1976; Robinson, 1973, Suydam and Weaver, 1977; Talton, 1973), Marilyn N. Suydam (1980:36) suggests the following composite list of characteristics of good problem solvers:

1. The ability to understand mathematical concepts and terms
2. The ability to note likenesses, differences and analogies
3. The ability to identify critical elements and to select correct procedures and data
4. The ability to note irrelevant detail
5. The ability to estimate and analyze
6. The ability to visualize and interpret quantitative or spatial facts and relationships
7. The ability to generalize on the basis of few examples
8. The ability to switch methods readily.

According to Hollowell (1977), Kochen, Badre and Badre (1976) and LeBlanc (1977), effective problem-solving involves four major steps:

1. *Understanding the problem:*
   An awareness of the problem situation that stimulates the person to generate a statement of the problem in writing,

orally, or merely in thought.

2. *Planning how to solve the problem:*
   a) Break down the components; enumerate data; isolate the unknown
   b) Recall information from memory; associate salient features with promising solution procedures
   c) Formulate hypotheses or a general idea of how to proceed

3. *Solving the problem:*
   a) Transform the problem statement into a mathematical form or construct representations of the problem situation
   b) Analyze the statement into subproblems for which the solution is more immediate.
   c) Find a provisional solution.

4. *Reviewing the problem and solution:*
   a) Check the solution against the problem
   b) Verify whether the solution is correct; if not, reject the hypotheses, the method of solution, or the provisional solution
   c) Ascertain an alternative method of solution

The mathematician Polya (1949) had suggested similar steps, using a series of action verbs:

1. *See*
   What is the problem? What are you trying to find? What is happening? What are you asked to do?

2. *Plan*
   What do you know? What operation should you use? What do you need to do to solve the problem? How can you obtain more information or data to seek the solution?

3. *Do*
   Carry out the plan you choose. Revise if necessary. If the plan does not work as anticipated, go back to the *plan* or *see* stages and try again.

4. *Check*
   Compare your answer to the problem conditions. Did you find or do that which was requested? Does the solution meet all the conditions? Does it make sense -- is it

reasonable? Is this the only solution to the problem? If the answer is not exact, is it close enough?

In solving problems, adults as well as students seem to be conditioned to think *convergently*. That is, through several years of practice in solving similar problems. the mind has become set in its approach to problem solving. This type of problem solving should not be ignored and most textbooks currently in use more than adequately cover this type of problem solving.

It is of utmost importance that, we, as teachers, create situations where students must think divergently. The students must be encouraged to break away from the traditional mindset and look for new, different, and creative ways to solve problems. It is this type of thinking that will be a more useful life skill in a fast changing society.

A simple example follows:

Problem:
Starting anywhere you wish, draw four straight lines that will pass through each of the nine dots without lifting your pencil from the paper.
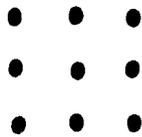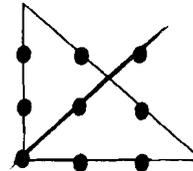
The Problem   The Solution

Thinking convergently, the problem solver will tend to perceive the dots as a square and make several frustrating attempts, without success. The problem solver who can break the mindset of convergent thinking, will see that there are no boundary lines to prevent the solver from drawing a line extending beyond the perceived edge of the square. Nothing was ever said about staying within the «perceived confines» of the nine dots, yet the organizing nature of convergent thinking is such that it leads one to see a block to the movements of his pencil, where, in fact, no block exists.

Problem solving becomes easier and clearer when students resort to a variety of aids to solve problems.

- Diagrams
- Tables
- Graphs
- Equations
- Lists

Problem:
MM. Martin, Blanchet et LeBlanc travaillent dans le même édifice. Ils sont banquier, avocat et bijoutier mais pas nécessairement dans cet ordre. Le bijoutier qui est l'ami de M. Blanchet est le plus jeune des trois. M. LeBlanc est plus âgé que l'avocat. Essayez de deviner leur métier ou profession. (Mollica, 1976: 26.)

In solving this problem, Danesi (1985) suggests a table in order to keep track of the possibilities. He suggests that an X be placed in the box of the item to be eliminated; if we conclude the opposite, he suggests an O. The table for the above puzzle will be as follows:

	banquier	avocat	bijoutier
M. Martin			
M. Blanchet			
M. LeBlanc			

The third sentence leads us to conclude that M. Blanchet is not the jeweller. We can, therefore, put an X in the appropriate cell in the array to eliminate M. Blanchet:

	banquier	avocat	bijoutier
M. Martin			
M. Blanchet			X
M. LeBlanc			

The fourth sentence allows us to conclude that M. LeBlanc is not the lawyer:

	banquier	avocat	bijoutier
M. Martin			
M. Blanchet			X
M. LeBlanc		X	

Sentence three and four also allow us to deduce that M. LeBlanc is not the jeweller. This is because the jeweller is the youngest of the three, while M. LeBlanc is at least older than the lawyer.

	banquier	avocat	bijoutier
M. Martin			
M. Blanchet			X
M. LeBlanc		X	X

A look at the table makes it clear that M. LeBlanc is the banker. We note this by putting an *O* in the appropriate cell and eliminating the banker possibility for the other two.

	banquier	avocat	bijoutier
M. Martin	X		
M. Blanchet	X		X
M. LeBlanc	O	X	X

We now see that M. Blanchet is the lawyer and M. Martin is the jeweller. As a result of our careful reading the final table will look like this. (Figure 2).

Tables may become more complex with more difficult problems involving more than three items or people.

	banquier	avocat	bijoutier
M. Martin	X	X	O
M. Blanchet	X	O	X
M. LeBlanc	O	X	X

Figure 2

Consider, for example, the following problem.

Il giovane Marco Ferrara ha chiesto una raccomandazione a Carlo Rossi, Mario Bruni, Paolo Moretti e Gianni Martino. Purtroppo non ricorda esattamente quale professione esercitano (avvocato, architetto, chirurgo, ingegnere). Sa che...

1. Mario Bruni è più anziano dell'avvocato e dell'ingegnere.
2. Il chirurgo cena sempre da solo.
3. Paolo Moretti cena spesso con Gianni Martino.
4. Il più anziano è anche il più ricco.
5. Carlo Rossi cena spesso in compagnia dell'avvocato e dell'ingegnere.
6. Gianni Martino è più anziano dell'avvocato.
7. A Mario Bruni non piacciono le attività sportive.

Sapresti dirgli quale professione esercitano questi quattro signori?

The following table will be very useful in solving the problem.

	avvocato	ingegnere	chirurgo	architetto
Mario				
Paolo				
Gianni				
Carlo				

Figure 3

These logical problems are best solved with the aid of a chart. Notice the progression from a three- to a four-answer approach and, as long as several of these logical problems are done in class or at home, and the solutions mastered, they can gradually become more complex and more difficult. Just as mathematic puzzles reflect and involve an elementary knowledge of mathematics, so too these logic puzzles or problems should be made to reflect vocabulary items learned in or outside the classroom scene.

This type of puzzle provides factual information from which students draw a solution by logical thinking. These puzzles demand no technical mathematical knowledge, but «call for clear thinking and an ability to establish the logical relationships which the data presented imply.» Wylie best describes the method of obtaining a solution for such puzzles:

> By repetitions of the fundamental process of setting up any hypothesis, drawing conclusions from it, and examining their consistency within the total framework of the problem, the answer is ultimately wrested from the seemingly incoherent information initially provided.

Consider as one example the following puzzle which would be presented to the class in the target language.

> *My daughters, Pamela and Karen, recently invited six girls from Quebec to visit them. Since the third floor of a neighbouring apartment building had not yet been rented, the Superintendent kindly agreed to allow each of them to use the six apartments. When I asked who was staying in each apartment and from which city each girl came, my daughters gave me the following clues.*
> 1. *Hélène is from Sherbrooke.*
> 2. *The girl from Quebec City occupies apartment 306.*
> 3. *Marie-Claire does not have a corner apartment.*
> 4. *The girl from Chicoutimi occupies the apartment between Hélène and Suzanne.*
> 5. *The girl in apartment 305 comes from Sept-Iles.*
> 6. *Gabrielle occupies apartment 302.*
> 7. *Paule occupies apartment 304.*

8.   *The girl from Trois-Rivières is in the apartment
     between the girls from Quebec City and Montreal.*
9.   *Françoise occupies the apartment across from Suzanne.*

The diagram below would certainly assist the students to solve the problem and a map of Quebec would also enhance the activity.

301	302
303	304
305	306
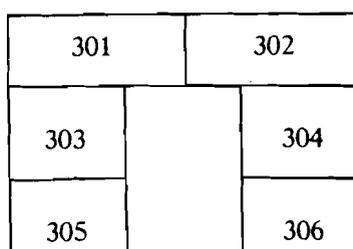
These logical problems may also be used for repetition and for reading exercise to recall lexical items presented in a variety of ways.

Problem:
Monsieur et Madame Touriste racontent à des amis qu'ils sont allés en vacances et que dans leur voiture il y avait beaucoup de personnes.

Monsieur Touriste: *Dans notre voiture il y avait un grand-père, une grand-mère, un beau-père, une belle-mère, une belle-fille, deux filles, deux soeurs, deux fils, un frère, deux pères et deux mères - ainsi que quatre enfants et trois petits enfants!...*

Monsieur Touriste: *Tu exagères! C'est vrai; toutes ces personnes étaient là, mais dans la voiture il y en avait moins de dix!*

Sais-tu combien de personnes il y avait dans la voiture? (Mollica, 1985:22)

The above problem is suitable to review family members. In addition it can be acted out since it is presented in the form of a dialogue. Another suitable example is the following:

Il y a eu un vol d'un tableau célèbre et tous les journaux

*ont raconté cet événement en premier page.   C'était à
l'inspecteur de découvrir le voleur aussitôt que possible.
Grâce à un dénonciateur, l'inspecteur a pu arrêter quatre
voleurs bien connus suspectés de vol.*
Interrogés, les quatre suspects ont constaté ce qui suit:
- C'est Henri qui l'a fait, a dit André.
- Si André dit c'était moi, il ment, a répondu Henri.
*- Ce n'était pas certainement pas moi, en effet, a jouté
Philippe.*
- C'est André, a murmuré Paul.
*Si on suppose que l'un des homme mentait e que les autres
trois disainet la vérité. qui était le coupable?* (Mollica,
1973:123).

As Marcel Danesi pointed out in a 1984 article published in
Quaderni di italianistica:

> From a psychological standpoint, it is frequently pointed out that problem-solving and language learning are interrelated.   Clark, for example, suggests that the reasoning used in problem-solving «is accomplished mainly through certain very general linguistic processes, the same mental operations that are used regularly in understanding language.»   What this implies is that problem-solving activities are supportive of language learning because they require the knowledge and use of a language's structural and lexical forms in arriving at a solution - the goal of any problem-solving activity.   As a consequence, these activities force the student to «think» in the target language because they involve cognitive processes closely linked to both the receptive and productive dimensions of language learning. In other words, students must first *decipher* the cues required to understand and solve the problem in the target language and subsequently *formulate* their solution in terms of the target language.   To quote Scribner, problem-solving, «involves relating or integrating the information presented in the individual sentences and assimilating it to existing lexical and nonlexical knowledge schemas.»

Danesi identifies puzzles under various headings:

1.   Discrete-Point Puzzles
2.   Global Puzzles and
3.   Interactional Games

He defines language teaching *puzzles* as problem-solving activities requiring the individual learner to formulate a solution;

and language teaching *games* as problem-solving activities involving interaction among learners.

Under Discrete-Point Puzzles, Danesi identifies:

(a) scrambled letters and words
(b) crosswords
(c) word searches
(d) tic-tac-toe
(e) word mazes
(f) match-ups
(g) cryptograms
(h) associations
(i) word-wheels
(j) visual puzzles

Under Global Puzzles he identifies:

(a) riddles
(b) word tricks
(c) logic problems
(d) mathematical problems

Under Interactional Games he identifies popular television games and teacher-made games.

Danesi's (1985) work, in fact, complements and supplements Mollica's article on «Visual puzzles», published four years earlier (1981). The visual element may play an important role in problem-solving, particularly since sight is the strongest of all senses.

1. *Pure Visual Element:* puzzles where only the illustration is evident and cues are found in the visualization itself.
2. *Integrated Visual Element:* puzzles where the illustration is integrated with the printed form and the two become and are inseparable.
3. *Additive Visual Element:* puzzles where visual representations are included solely for their aesthetic illustrative value; that is, they strengthen the printed word but add little, if anything, to it.

Rebuses

A picture may sometimes stand for a letter or a sound. The position of the illustration on the page may make it stand for the whole word or part of a word. This is called *Rebus*, Latin for «with things.» This kind of writing was known to the ancients; indeed,it is the basis of Egyptian hieroglyphics and other alphabets, including Chinese symbols. Rebuses are not only ideal for illustrating single lexical items, but are also useful for proverbs, maxims, sayings, etc. For example, teachers may wish to illustrate a series of nouns, verbs or adjectives by giving also the definition of the word found in the rebus itself. The activity then becomes a relatively simple one. If, on the other hand, the teacher wants to challenge the students' minds, definitions are omitted and only the rebus itself is provided for decoding. But the way a word is positioned may also provide the source for a rebus. In this case, the emphasis is on the printed word rather than the illustration.

Consider the following:

(a)
sight love
sight
sight
sight

(b)
head ache

(c)
bridge
water

(d)
hand
hand
hand
hand
hand
deck

(e) $1 \quad AB \quad \cancel{A} \quad \dfrac{P}{100}$

(a) = love at first sight; (b) a splitting headache; (c) = water under the bridge (d) = all hands on deck (e) = un grand ab a traversé par i cent sous p: Un grand abbé a traversé Paris sans souper.

Anachronisms

To encourage students to recall vocabulary, teachers may wish to use an illustration in which anachronisms appear. Basically, these are «anomalies». Students are asked to identify the items

which could not possibly be part of the illustrated scene or are actually incorrect in the illustrated scene. In addition to the fun element that this activity may provide, it should help develop students' awareness of what is visually and conceptually right. The activity will encourage concentration and observation of detail and, if the teacher wishes to provide an activity for group work, the illustration is appropriate to encourage students to work as a team. As a result, such an activity will foster the awareness of an intrinsic interconnection between visual perception and the ways language verbalizes about it.   Furthermore, it fuses language and humour - two important elements in the teaching and learning processes.

Intruders

Some basic second-language textbooks include a series of words from which the intruder (i.e., the word that does not belong in the given group) should be sought out and identified. I should like to suggest a similar activity for second-languages using the visual element and by asking the student to justify the choice made.

A1	A2	A3	A4
B1	B2	B3	B4
C1	C2	C3	C4
D1	D2	D3	D4
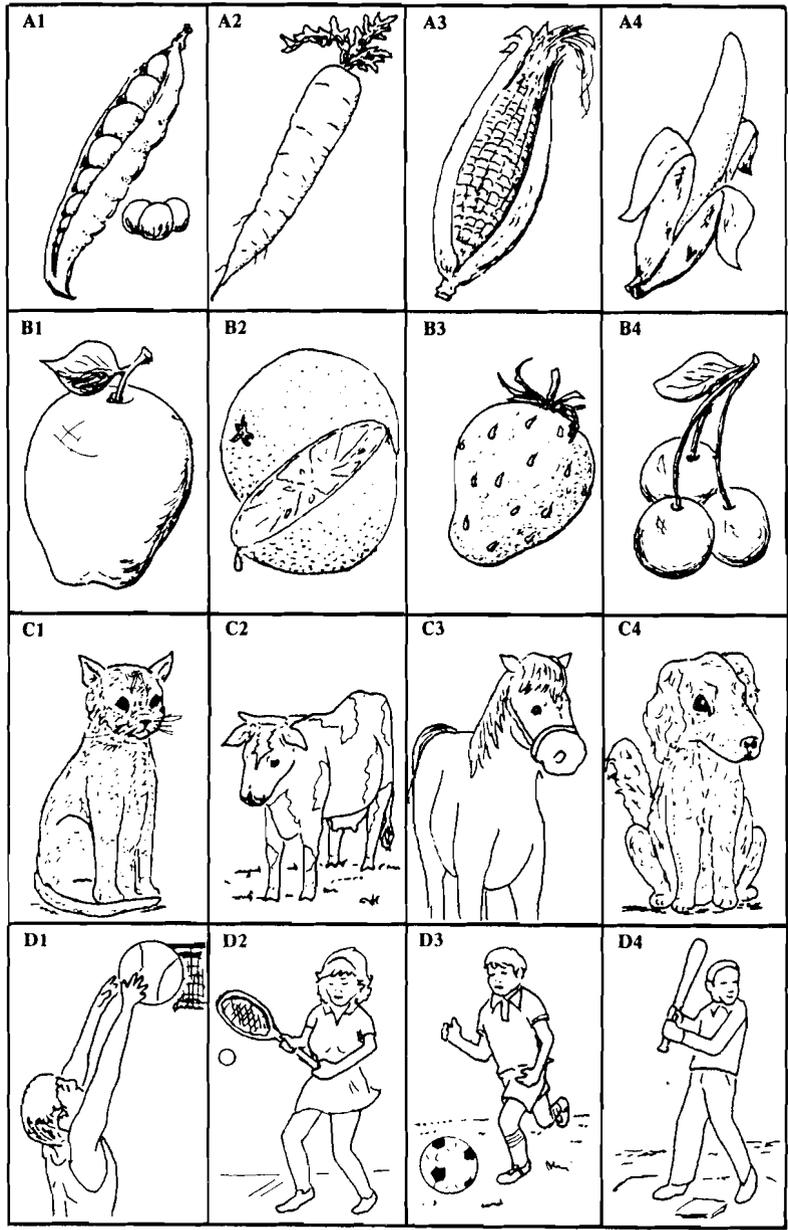
This activity also allows us to recall some vocabulary

already learned and strengthen lexical associations. For example, the answer for Row A, is *the banana* (A4): the banana is a fruit, all the other examples are vegetables. But equally acceptable is answer A2, *the carrot*. The explanation given might be that while all other fruits and vegetables have a skin, the carrot does not.

The next set of illustrations (Row B) identifies four fruits. The logical choice for the answer is *the strawberry* because all other fruits grow on trees. There is, in this example, a contrast *on trees/on the ground*. But equally acceptable may be the answer *the orange*. The explanation for this choice may focus on colours. All the other fruits are red, the orange is not. As long as the explanation is a logical one, it should be accepted.

In Row C, the answer appears more complex. All four animals are domestic; two may live in the house (cat, dog), the other two on the farm (cow, horse). The answer given is generally the cow (*la vache*) but the explanation is always incorrect. Students state that *vache* is feminine whereas all the other animals are masculine. I assure that while the horse is masculine, the other two are female: a female cat and a bitch. What students have failed to do is *to read the illustration* in French. If they had done so they would have discovered that *le chat, le cheval* and *le chien* all begin with the [ch] shound while the initial sound of *vache* is different.

In Row D, a number of answers are possible as long as the explanations are logical.

(a) The answer is *the basketball player*. He is the only one who wears a sleeveless shirt.
(b) The answer is *the tennis player*. She is the only female in the group.
(c) The answer is *the soccer player*. Soccer is the only sport played with one's feet; all other sports illustrated here make use of the hands.
(d) The answer is *the baseball player*. In the first three illustrations a ball is clearly visible, while none appears in the baseball illustration.

The goal of this activity is not necessarily a matter of one correct response, but of how logical is the explanation. Observation has shown that in the attempt to solve the problem and in the eagerness to provide suitable explanations, students rapidly forget that they are using another language. In other words, the focus has shifted from language form to language use, since in the attempt to reach a solution, the learner formulates his/her verbalization to the solution in the target language. This psycholinguistic process is, in effect, conducive to «thinking» in the target language.

Crossword Puzzles

When Arthur Wynne published the first crossword puzzle in the puzzle page of Sunday's New York *World* on December 21, 1913, he probably did not realize the instant success the puzzle was to enjoy. The biggest craze that America had ever seen was under way. Roger Millington provides several examples to support this statement:

> Engaged couples announced their good news by composing appropriate crosswords and sticking them in the local paper. The Rev. George McElveen, a Baptist pastor of Pittsburgh, was the first of many preachers to use the crossword puzzle to attract bigger congregations. He announced that a large blackboard would be placed in front of his pulpit. On it was an original puzzle and the audience were required to solve it before he would begin his sermon. The solved puzzle, needless to say, proved to be the text for his sermon. In Atlantic City, crosswords were distributed in church to stir interest in a current missionary campaign in China and Persia. Churchgoers were requested, however, not to solve the puzzles during the service. [...]

In December 1924, unaware that the craze was shortly to achieve similar magnitudes in Britain, *The Times* took pity on America. In an article headed AN ENSLAVED AMERICA, it noted that «All America had succumbed to the crossword puzzle.» Guessing inaccurately, it continued:

> The crossword puzzle is by no means a new thing; in all likelihood it was known as long as the Civil War. *The Times* felt that the crossword was «a menace because it is making devastating inroads on the working hours of every rank of society.» How devastating? Well, according to their New York correspondent, five million hours daily of American people's time -

most of them nominally working hours - were used in unprofitable trifling.

A great deal has been written on the crossword puzzle in the language class using the printed word as a stimulus. Dino Bressan, for example, prefers the crossword puzzle for the obvious contribution it can make from a linguistic point of view.

Abbigliamento

| il berretto | i calzini | la cravatta | la gonna | i guanti |
| il maglione | le pantofole | il pigiama | i sandali | la sciarpa |

Cruciverba A *Abbigliamento*, 25

Abbigliamento

- ☐ O2
- ☐ V7
- ☐ O10
- ☐ V11
- ☐ O14
- ☐ V1
- ☐ O4
- ☐ V5
- ☐ V4
- ☐ O9
- ☐ O8
- ☐ O12
- ☐ O13
- ☐ V3
- ☐ V6

☐ *la* biancheria intima	☐ *la* camicia	☐ *il* cappello	☐ *la* gonna	☐ *i* guanti
☐ *un* impermeabile	☐ *il* maglione	☐ *le* muffole	☐ *i* pantaloncini	☐ *i* pantaloni
☐ *le* pantofole	☐ *il* pigiama	☐ *le* scarpe	☐ *gli* stivali	☐ *la* tuta

Cruciverba B *Abbigliamento*, 27

«A carefully graded selection of crosswords in order of complexity,» maintains Bressan, «will contribute to the acquisition of new words and phrases as well as the consolidation of previous knowledge through repetition.» Bressan classifies direct-definition clues into nine different headings.

Abbigliamento

☐ V1

☐ V2

☐ V9

☐ V10

☐ V13

☐ O15

☐ V6

☐ O14

☐ V3

☐ V12

☐ V5

☐ O8

☐ O4

☐ V11

☐ V7

il berretto   la biancheria intima   il cappello   i calzini   la camicia
la cravatta   un impermeabile   le muffole   i pantaloncini   i pantaloni
i sandali   le scarpe   la sciarpa   gli stivali   la tuta

Cruciverba C Abbigliamento 29
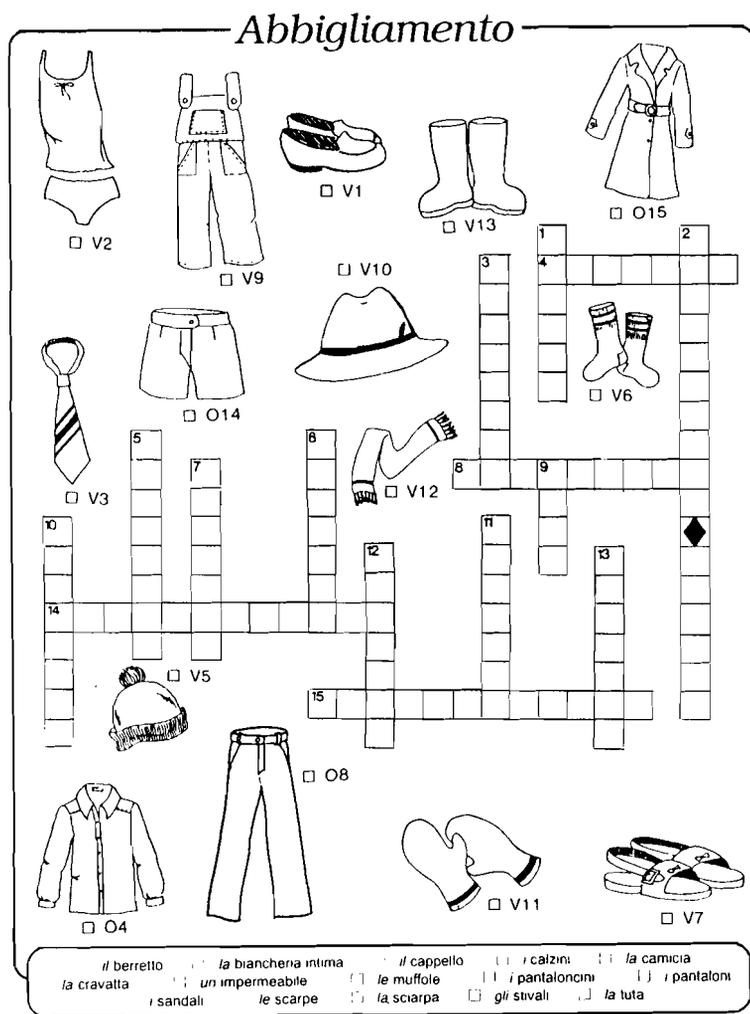
David E. Wolfe in an article published in the same journal
two years later acknowledges Bressan's worthwhile contribution
and offers a number of examples «as perhaps more realizable in
the language class, assuming that the crossword puzzle is teacher-
prepared and is based on the material previously studied by the
student.» One of the examples Wolfe suggests is the picture
clue. «Any concrete noun which the teacher can draw,» declares
Wolfe, «is appropriate as a clue assuming the noun has been

taught.» We concur with Wolfe and suggest that the picture clue is an effective way of preparing a crossword puzzle particularly when teachers wish to stress vocabulary dealing with a specific theme. Crossword puzzles may be time-consuming to make up. There exists, however, computer software which allows the teacher to enter the desired words and - as if by magic! - the computer will produce a possible crossword with the words given.

Abbigliamento

Cruciverba D *Abbigliamento*, 31

As Latorre and Baeza point out,

> the clues are central to the drilling objective of the crossword, since most
> of the information the student gets for doing the exercise is found in
> them. The clue is to the crossword exercise almost what the prompt is to
> the old pattern drill: it is the stimulus that keeps the drill going. As such,
> there is no place here for ambiguity, deliberate or otherwise. On the
> contrary, clarity is essential. By reading the clue, the student must know
> with a fair degree of accuracy which word is required, since in most cases
> he is being confronted with a linguistic problem within his capabilities
> and knowledge.

Mollica (1987, 1988a, 1988b, 1991a, 1991b, 1991c) prepared a series of crossword puzzle using a thematic approach. Twenty words were chosen arbitrarily. The first puzzle contains ten illustrations; the second puzzle introduces ten new illustrations and recalls five from the previous puzzle; the third puzzle repeats the ten illustrations of the second puzzle and recalls the five unused illustrations of the first puzzle. The last puzzle reviews all the twenty illustrations.

Chère Françoise

One of the activities which is bound to generate discussion and problem-solving in the classroom is letter writing. The class should be divided into two groups. One group is asked to write a problem, the other will provide solutions, not knowing what the problem is. When an attempt is made to match the solution with the problem, the results will be hilarious. The next step is to provide a problem and ask students to write a solution. And finally, students should be asked to submit (anonymously) problems they would like to see discussed.

Legal Cases

Legal cases are most useful to promote language interaction in the classroom. A stimulus is given [the problem]; students will verbalize the solution. Any plausible solution should be accepted.

Si vous étiez le juge...
En écoutant lire le testament de feu M. Henri Marchand,

Georges est très content d'apprendre qu'il va hériter du portefeuille de son oncle. En recevant et en examinant le portefeuille, il y trouve dix billets de cent dollars. Ses cousins, jaloux, exigent qu'il partage la somme avec eux. Georges soutient que son oncle lui a laissé à lui le portefeuille et, par conséquent, tout ce qu'il contient. Ce cas finit au tribunal.
Si vous étiez le juge, diviseriez-vous l'argent parmi tous les neveux ou donneriez-vous la somme entière à Georges?
(Choisissez parmi vous deux avocats: un qui plaidera la cause de Georges, l'autre qui représentera ses cousins.)

Sequencing

Students should be asked to put a series of cartoons in chronological order. To achieve the maximum use for the

speaking skill, it is suggested that each student go about the room describing his/her frame to other students. As the students describe the frame they hold, it should be soon evident to them which four frames constitute a complete strip. Once all the four frames have been found, each of the four student describes his/her own frame. The result will be an oral summary of the comic strip.

Sequencing may also be done with written anecdotes. Two examples follow. In the first, there are two anecdotes which have are out of sequence; the second contains three.

L'avocat et le médecin.
01. - Très bien. Je vais vous défendre.
02. Une femme inquiète se rend chez un médecin.
03. - Avez-vous de l'argent?
04. - Je le crains, madame, car il sera trop long.
05. - Maintenant, que vous accuse-t-on d'avoir volé?
06. - Enfin ce n'est pas grave, car il est déjà arrivé plusieurs fois premier aux courses.
07. - Une Cadillac 1990.
08. L'avocat examinait un client devant lui.
10. - Ça va, dit l'avocat, en prenant quelques notes.
11. - Il marche à quatre pattes, ne mange que du foin.
12. - Mais ça va vous coûter cher.
13. - Bien, dit le médecin, je vais tenter de le soigner.
14. - Non, je n'ai pas d'argent mais j'ai une Cadillac 1990.
15. - Le traitement, va-t-il nous coûter cher?

La femme, un mauvais écrivain et un agent de police.
01. Elle voudrait faire de la littérature.
02. Arrivé à «Conclusion du test d'haleine» il inscrit consciencieusement:
03. Un mauvais écrivain confie à un ami:
04. Puis l'agent rédige son rapport.
05. - De gauche à droite, madame.
06. - Tiens! il sait déjà lire!
07. Un agent motocycliste arrête un automobiliste en état d'ébriété et le conduit au poste de police.

08. - *Quelle catastrophe!*
09. *«Saint-Émilion 1953.»*
10. - *Quelle est, demande-t-elle, la meilleure façon d'écrire?*
11. *On lui fait passer tous les tests, y inclus un examen à l'alcotest.*
12. *La réponse vient, comme un éclair.*
13. *Une femme du monde va voir un écrivain célèbre.*
14. *Mon fils de quatre ans a jeté au feu mon manuscrit.*

Conclusion

At the beginning of the chapter I made reference to both *convergent* and *divergent* thinking. Effective problem solving requires both divergent and convergent styles to be used throughout the process. But in addition it requires a definite commitment on the part of the student; in short, it demands his involvement. Active participation is essential for the success of problem solving.

More concisely as H.H. Stern (1983:4) pointed out in a publication

> In the last few years a new view of language acquisition has resulted partly from research on second language learning partly from the immersion experience. It underlines the fact that a language cannot be learned from formal practice alone. Much of it is learnt best in the process of doing something else while using the language.

Teachers should be conscious of this requirement and recall the old adage which is self-explanatory.

Tell me and I forget.
Show me and I know.
Involve me and I learn.

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