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ABSTRACT

Two critical thinking activities (information transfer and problem solving) have been used effectively in the writing classroom with level 4 students in a four-level intensive English program. In the information transfer activity, students move from graphic stimuli to written texts. Student writers practice critical thinking by discussing data, reformulating it, and adding their own analysis. Advantages of this activity are that the material is visual, that it is open-ended, and that students get to work on explaining trends and fluctuations over time. The topic of instruction is first discussed in small groups, and then followed-up with whole class discussion, exploration of rhetorical options, and completion of a writing assignment. The second activity, problem solving, involves stories that reflect students' concerns, where some action to improve the situation is possible, but also one where there is some ambiguity. Topics for this activity can be generated by listening in class for themes that come up frequently, and by noting the challenges and difficulties students write about in their journals. Advantages of this activity include: experiencing connections of empathy; finding a balance; thinking logically; and arguing persuasively. The instructional sequence involves: introducing the topic; reading the story; exploring the story using a five-step questioning strategy; interviewing each other; discussing possible solutions; and writing an essay. (Eleven attachments provide graphs, topics, discussion questions, and activity sheets.) (RS)

Writing for Critical Thinking: Problem Solving and Information Transfer

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Information Transfer:

Introduction

Examples

Advantages of Using Information Transfer for Writing Instruction

The source material or body of information is:

* graphic

* open-ended

Special Benefits of Using Charts and Graphs

Students practice:

* selecting...

* explaining...

Instructional Sequence

* introducing the topic

* viewing and discussing the visual

* posing and answering questions

* writing invention

* exploring rhetorical options

* writing an essay: composing, reading, and revising drafts

Weissberg, R. (1987). Information transfer in the teaching of academic writing. Paper presented at the Conference of the National Association of Foreign Student Affairs, Long Beach, CA. ERIC ED 292 100.

Problem Solving:

Introduction

Examples

Advantages of Using Problem Solving for Writing Instruction

* experiencing connections of empathy
* finding a balance
* thinking logically
* weighing alternatives
* arguing persuasively

Instructional Sequence

* introducing the topic
* reading the story
* exploring the story using the five-step questioning strategy
* deepening understanding of the story: yes, no, or maybe
* interviewing each other
* discussing solutions in small groups and making notes
* writing an essay: composing, reading, and revising drafts

Greenberg, I. (1988). Steps for problem solving in ESL. Paper presented at the CATESOL State Conference, San Diego.

Wallerstein, N. (1983). Language and culture in conflict: Problem-posing in the ESL classroom. Reading, MA: Addison-Wesley.

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Writing for Critical Thinking:
Information Transfer and Problem Solving

Steven Storla

Today I'm going to talk to you about two critical thinking activities for the writing classroom: information transfer and problem solving. Writing and critical thinking are natural allies. They promote one another. Critical thinking activities in the composition class foster cooperation, cognitive growth, and improved writing. These activities are based on several language skills, not just writing. Writing is the last part of the process, and it grows naturally out of the other activities. These activities are fun to do in class. They generate involvement; students work together in a balance of small group and whole class work.

For each of the two activities, I'll start by showing you examples of what I've been using in my classroom this semester with my students, who are Level 4 students in a four-level intensive program. Then, I'll discuss some of the advantages of spending time with this technique. Next, we'll look at an instructional sequence.

Let's begin with the first of our two techniques: information transfer. Information transfer means translating data from one

form to another. We move from graphic stimuli, or visuals--like charts, graphs, diagrams, figures, maps--to written texts. Using information transfer, student writers practice critical thinking by discussing data, reformulating it, and adding their own analysis. The teacher provides the students with a cognitively challenging set of non-textual data and helps them to make sense out of it through class discussion and their own writing.

[Transparency: Some Fast-Growing Ethnic Groups]

Here's a chart showing some fast-growing ethnic groups. When I showed this to my students, they were able to talk about the various growth rates. They also noted that the Hispanic groups had lower growth rates though they were much larger.

[Transparency: Student Composition]

Here's a composition one of my students wrote after our discussion...

I have one more set of transparency and student composition to show you.

[Transparency: A Picture of Increasing Pessimism in Houston]

These four graphs, entitled "A Picture of Increasing Pessimism in Houston," show the results of public opinion surveys conducted over the past eleven years in the Houston area. In class we discussed all four graphs, but most students were particularly interested in the one asking, "What is the biggest problem in the Houston area?" One student noted a correlation around 1987 between the opinion that economy/poverty was the worst problem and the time of greatest agreement that job opportunities were only fair or poor, not excellent or good. Another student asked if people were allowed to pick just one problem, and I said I thought that was the case. He said that might explain why in 1992 crime and drugs are rated the biggest problem, even though the economy and poverty are still important concerns. We also spent some time discussing possible cause and effect relationships, and some students pursued this pattern in their essays. Here's one....

[Transparency: Student Composition]

Let's look briefly at some other materials.

[Other Transparencies]

This is a good time to talk about where I get the material. The first two examples I showed you are from The New York Times. Local newspapers are also good sources and so is USA Today, as we saw. Next semester I plan to look through some content-area

textbooks for the type of visual material my students will be studying once they start taking regular academic courses.

Let's turn now to some advantages of using information transfer for writing instruction.

The most important advantage is that information transfer material is graphic, it is visual, it is pictures. Because it uses few words, students take on the task of recasting the information to spoken form, and then to written form, that is to say into words. This practice is a great benefit to academic ESL students, who need to learn to paraphrase material. Doing this kind of work helps them gain confidence that they can be articulate on their own, rather than just learning and then repeating or copying the words of others.

Another benefit to information transfer is that it is open-ended. This kind of data gives the students a topic and quite a bit of information, but it always leaves questions unanswered. It allows a lot of leeway for the students to add their own ideas and interpretation.

Now I want to turn for a moment to a couple of benefits that apply specifically to using charts and graphs. All of the examples I'm showing you today are charts or graphs, but there are other possibilities for information transfer materials. Organizational

diagrams, for example, or maps, or flow charts, or designs of equipment, or pictures that show the cycles of nature--all of these work well too.

I've been concentrating on charts and diagrams because they have particular benefits. The first benefit is that students get to practice selecting specific information from a larger body of data. It's unlikely that they will want to put all possible facts from the graph in their essay, so they need to pick out which ones are the most important for the point they want to make.

Second, students get to work on explaining trends and fluctuations over time. On the Houston opinion graphs, for instance, we saw a number of fluctuations and trends relating to public perception. Understanding these is an important academic and civic skill.

So, now I've explained information transfer to you, shown you examples, and shared advantages to using it. All that's left to talk about is how to teach information transfer in your classroom. On your handout this section is called Instructional Sequence.

We begin by introducing the topic. I usually put a question on the board and ask my students to talk about it in small groups. Before we looked at the Houston graphs, for example, I asked each group to discuss what they felt the biggest problems in Houston

were. We follow up with whole-class discussion. Then we look at the visual, on a handout or transparency, and I ask the students, "What do you see?" One student may state the topic, another will describe the layout of the graphic, and another will say one part of the data.

After we have discussed the visual in general for a few minutes, I start posing specific questions to elicit certain parts of the data. Sometimes, and I think this is better, I ask the students to ask each other questions. I jot some responses on the board. Now we're really seeing the information transferred from one modality to another to another. First it's graphic on the chart, then it's oral when we're talking about it, and then when I jot the idea on the board it becomes the written word. Putting a few ideas on the board is the beginning of writing invention. I ask students to continue writing invention for awhile, either individually or in small groups.

After they've had time to make some notes, we explore rhetorical options for writing a short essay using this material as a source. We consider possible interactions between the subject matter and different patterns of prose development, such as comparison/contrast, cause and effect, and chronology. Once we talk about the possibilities for rhetorical structure, students are free to choose their own organization for the material as they get ready to write a draft. So, they compose a draft of their essay.

Then they read one another's drafts and offer suggestions for improvement based on guideline questions I provide. At this point I take up the drafts and look them over, pointing out places where they need to offer more data or more explanation. I also mark errors. Finally, students revise their drafts.

At each phase of this composing process, I always encourage them to return to consult the visual once more. They often see something else they'd like to add. It might be a relationship between two parts of the data that they had not noticed before, or a piece of information they left out which they now realize would strengthen their essay. We do all of this writing in class. It takes about three fifty-minute periods.

Let's turn now to the second of our two activities, problem solving. The outline for this part of my talk is on the other side of your handout. Problem solving stories reflect our students' concerns. The story describes a situation that focuses on one specific problem. The problem should be one where some action to improve the situation is possible, but also one where there is some ambiguity, where there is no one obviously correct answer. The dilemma is presented as having several facets and contradictions. The situation is open-ended; possible solutions emerge from group discussion. I first learned about problem solving stories from Nina Wallerstein's work. Let's look at one of her stories.

[Transparency: Wallerstein]

To decide on topic areas for problem posing, I begin by listening in class for themes that come up frequently with my students, themes that interest them and affect their lives. What are their daily and ongoing concerns? I also note challenges and difficulties they write about in their journal. In their journal or for a composition, I sometimes ask students to write on the topic, "A Difficulty I Am Facing," or "My Biggest Problem." Topics also come up when students explain to me why they were absent. Areas include problems at school, cultural differences, future plans, money worries, intergenerational conflict, homesickness, and work-related conflict. When I use a topic inspired by a class member, I always change details to avoid identifying the story with a particular student.

Before we move to our instructional sequence for problem solving, I'd like to tell you all about a few advantages to using this technique for writing instruction. First of all, students experience connections of empathy by working with these stories. They feel less isolated in the problems they face. Even if the particulars of a situation don't apply to a student's life, she or he will often find that the underlying conflict or at least the emotions involved resonate for them as well.

Second, students learn to find a balance between the personal and the social origins of human difficulties. I find that many students come to a better understanding--through class discussion and the writing process--of the interplay between the variables that shape people's lives. This means that they recognize that the importance of individual initiative and effort is tempered by an awareness that you can't surmount some difficulties alone. Either you have to address them together with other people by collective or community action, or you must accept some imperfect solution.

The last three benefits of this language-learning activity fit together and follow one another in the instructional sequence. Students learn to think logically about complex problems, to carefully weigh alternative solutions to these problems, and to argue persuasively for a particular solution.

As we begin going through the instructional sequence now, I'm going to use as an example a problem solving story I wrote and have used with my class. The first step is introducing the topic, which I usually do with a question on the board.

[Transparency: Can you work...?]

Can you work full time and go to school full time? This question generates good discussion. Then we read the story from a handout, both silently and aloud.

[Transparency: "Carmen's Problem"]

Next we explore the story using a five-step questioning strategy, which I have borrowed from Nina Wallerstein's work.

[Transparency: Discussion Questions for "Carmen's Problem"]

The underlined part is the basic sequence: retell the story, define the problem, share similar experiences, fit the problem into its social context, and discuss alternatives and solutions. These five steps can be used to discuss any problem solving story. Here's how I adapted it for Carmen.

The next phase is for students to deepen their understanding of the story by responding to a series of yes, no, or maybe questions. This activity is from Ingrid Greenberg. Here are these questions for our story.

[Transparency: "Carmen's Problem": Answer Yes, No, or Maybe]

By now, students have a good understanding of the story. At this point, I'd like them to consider possible connections between the story and their own experiences and those of their classmates. I put the students in pairs and give each pair two copies of an interview sheet. I ask them to interview each other and write down the answers. Here is the interview sheet for our story.

[Transparecy: Interview]

After a brief whole-class follow-up to this activity, the students move to groups of three or four to discuss possible solutions to the problem and make notes about their discussion.

After another quick whole-class discussion, students begin writing their essays. The notes they have taken make up their invention. As the writing process goes on, I use the same system that I told you about for the information transfer activity: composing drafts, reading one another's drafts to offer suggestions, getting feedback from me, and revising.

At the beginning of their essay, students include a concise summary of the problem situation. Then they discuss solutions. Here I see two possibilities for instructional approaches. Since students have already discussed different solutions in class, you may want them to focus their solution on one preferred solution, presenting their reasoning and evidence for choosing this alternative.

On the other hand, you may decide that you'd like your students to have the opportunity to explore in writing some of the varied options that have been raised in class. If this is the case, you will want your students to write about several different solutions that have emerged from class discussion. They should

explain the ramifications of carrying out each solution--both benefits and drawbacks. And what about their thesis? Should it be a statement of their chosen optimal solution, or an indication that they are going to weigh the merits of a number of solutions?

Another option is a delayed thesis, one which the student writes after all the information has been presented. Thus they can weigh the pros and cons of each solution, and then choose the one they believe most effective, not in isolation, but in light of all the possible alternatives.

In addition to alternative solutions, students can also write about counterarguments to their proposed solutions, that is to say potential objections or limitations to their proposal that an informed reader could raise. By acknowledging and then accommodating or refuting these, writers show that they have carefully considered all of the implications of implementing their solution.

This model that I am telling you about is rhetorically rich and adaptable. Depending on the problem, on your students' ways of thinking, and on your own rhetorical orientation, it may turn out that there seems to be one clearly preferable alternative. On the other hand, you and your students may decide that there are multiple possible workable alternatives, though having perhaps differing outcomes. The most important thing is that the students

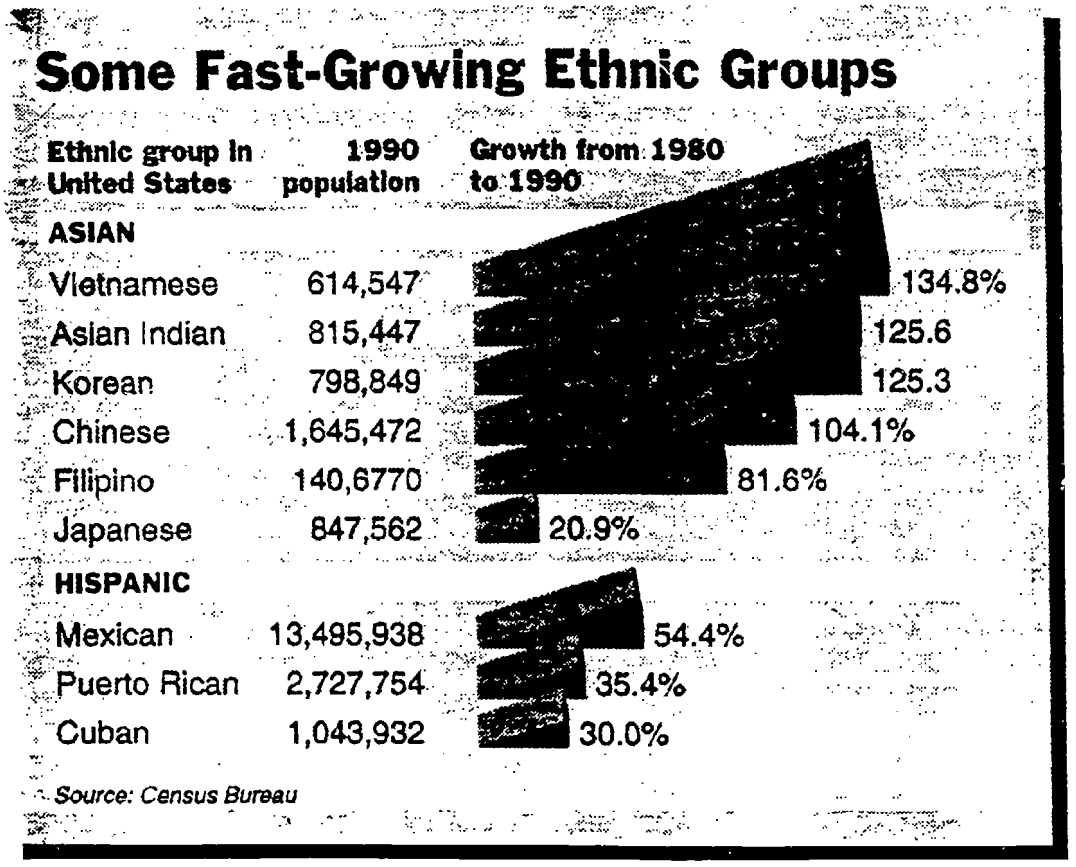
get a chance to develop fully in writing some of the ideas they have generated together through class discussion. Here's the essay one of my students wrote about "Carmen's Problem."

[Transparency: Student Composition]

I hope that I've made information transfer and problem solving sound like interesting and worthwhile activities to do with your students. I certainly think they are. Even so, I'm going to close with a couple of caveats. First of all, these skills can be taught by the teacher and learned by the students in a simplistic, reductive way. The instructor can avoid this pitfall by allowing plenty of time for students to write invention and to discuss rhetorical possibilities. She can also stress to the students their responsibility to shape the material. This is something I'm still working on.

Another warning I have to give you concerns excessive use of these techniques. Even when students are encouraged to shape the material, their potential for creativity and self-expression is--let's face it--limited. This semester I've been alternating these activities with composition writing where the students choose their own topics freely, and I've found this a good balance. In addition, my students keep a journal.

In conclusion, information transfer and problem solving activities empower ESL student writers to develop their critical thinking skills by transforming ideas using their own cognition and writing. Thank you.



THE NEW YORK TIMES, SUNDAY, SEPTEMBER 6, 1992

Sec. 3, p. 4

Fast-Growing Ethnic Groups

According to the Census Bureau, there are a lot of ethnic groups in the United States that are growing up with fast rate. We can classify those groups into two categories: Asian and Hispanic.

Vietnamese has the highest percentage of growth, and Asian Indian is the runner up. Chinese, Korean, and Filipino, which have largest population the the U.S., are growing up with a slower rate. In the last position, Japanese population, growing up with a very slow rate.

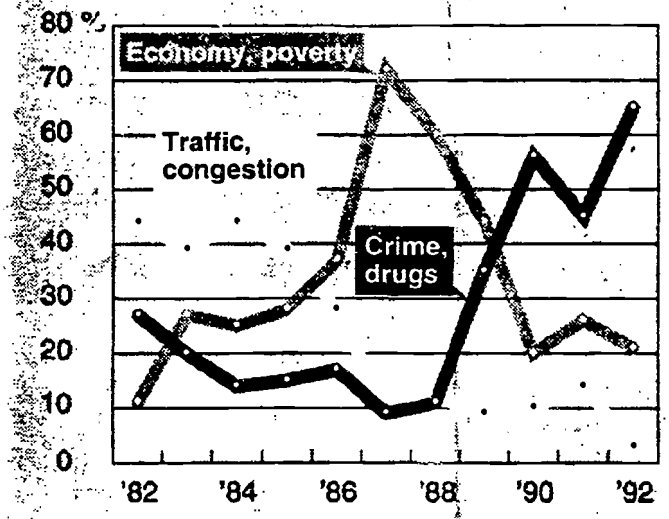
On the other hand, The Hispanic ethnic groups have a slower growth rate than Asian. For example, Mexican has the highest growth rate, with Puerto Rican and Cuban to follow. In contrast to Asian ethnic groups, the Hispanics have the largest population in the United States.

Finally, with this growing rate, The Americans will look for their ancestors in the Hispanic and Asian countries instead of European countries as they did before.

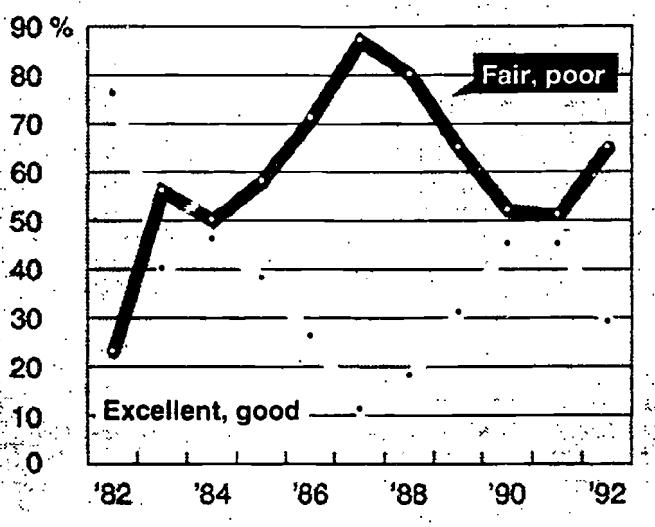
A Picture of Increasing Pessimism in Houston

Results from public opinion surveys conducted over 11 years in the Houston area.

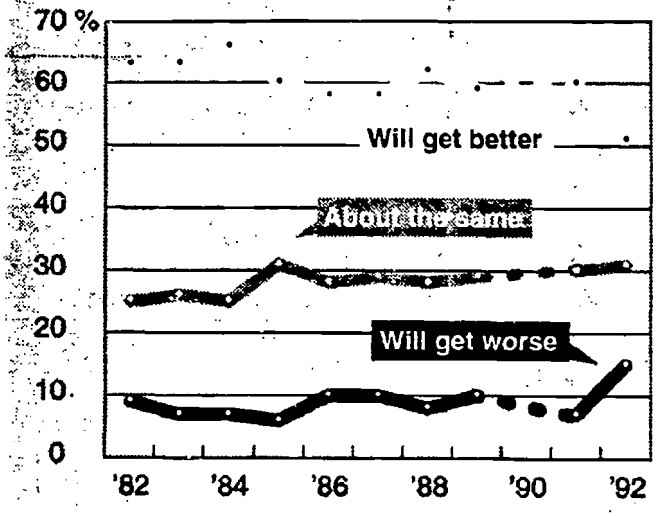
What is the biggest problem in Houston area?



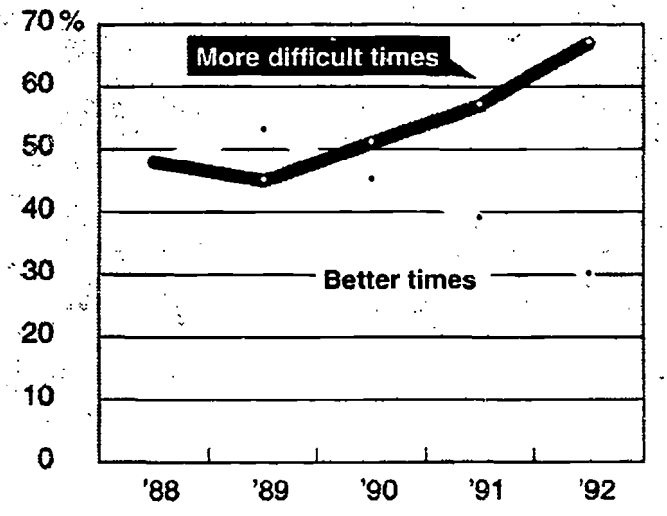
How do you see job opportunities?



How will things be for you in Houston three or four years from now?*



When you look ahead to the next few years, where do you see the country headed?



Source: Rice University, Department of Sociology

This question was not asked in 1990.

New York Times, Thursday, Aug. 13, A20

Crime and Drug Problem

According to the picture, from 1987 to 1992, the percentage of people who think crime and drugs are the biggest problem has increased. In 1992, people think crime and drugs are the biggest problem even though the economy has been going down and many people don't have jobs. The percentage of people who believe that crime and drugs are the biggest problem has increased 50%. This is a number which we have to think about it. For me, there are several reasons to explain why people think crime and drugs are the biggest problem.

The first reason is that the drugs now is everywhere and the government has not prohibited it yet. Even though there is a law which bans people to buy and use drugs, many people use drugs, even children under 18 years old. Drugs affect badly to the health and that is a cause of crime.

Another reason is the government allows people to buy and use guns. This is one problem. I agree that buying and using guns is the free rights, but it is also dangerous to other people.

The other reason is economy has been going down for a few last years. A number of people who were lain off and don't have jobs have increased fast. When the life becomes difficult, crime increases.

However, following the picture, we see the percentage of people who think economy is the biggest problem has decreased. That means people has not been worried too much about economy. The reason for this idea is the ratio of people who don't have jobs is less than other places.

Adding all of those reasons above, we will understand why people in Houston in1992 think crime and drugs are the biggest problem. I guess that in 1993 the percentage of people who believe crime and drugs are the biggest problem will increase because of going down economy.

1. My Family

My name is Abdul. I live with my wife, Leila. We have two children, a son and a daughter. Daoud is two years old and Sandra is eight. My mother lives with us in my house. My grandmother lives nearby. My sister and her family live in Saudi Arabia. I'm sad they live far away. I miss them.

Tools for Dialogue

1. Does Abdul have children?
   How old is Daoud?
   How old is Sandra?
   Who lives in the house?
   Where does Abdul's grandmother live?
2. Where does her sister live?
   Why is Abdul sad?
   Who does Abdul miss?
3. Who lives in your house?
   In your family, who lives in the U.S.?
   Do they live nearby?
   Do you have family in another country? Where?
   Do you miss them?
4. Why did you move?
   Why didn't all of your family come with you?
5. Do you visit family in the U.S.?
   Do you visit family in your home country?
   Does your family visit you?
   Do you write letters? Do you send money?

Conversation Circle

Are you married? Are you single? Are you divorced? Are you widowed?
Do you have children? How old are they?
Do you want children?
Do you have brothers/sisters/aunts/uncles/grandmothers/grandfathers/nieces/nephews/cousins? How many do you have? How old are they? Where do they live?

Nina Wallerstein. Language and Culture in Conflict: Problem-Posing in the ESL Classroom. Reading, Mass.: Addison-Wesley, 1983, p. 70.

Practice

Who do you miss?	I miss _____
Who do*es* she miss?	She miss*es* _____
Who do*es* he miss?	He miss*es* _____
Who do they miss?	They miss _____
Who do we miss?	We miss _____

Suggested Activities

1. Ask students, "What is family?"
2. Have students draw their family tree and fill in the names. Ask them to write sentences, i.e. I have two uncles. Their names are . . . .
3. On a world map, locate where families live with pins. Connect with colored threads.
4. Design an exercise for students to interview each other about family members (what they look like, where they live, etc.).
5. Have students bring in family photographs to share.

Nina Wallerstein. Language and Culture in Conflict: Problem-Posing in the ESL Classroom. Reading, Mass.: Addison-Wesley, 1983, p. 71.

Can you work full time

and

go to school full time?

"Carmen's Problem"

Carmen Hernandez has a full-time job and goes to school at the same time. She attends class in the morning, Monday through Friday. She takes a full load of classes. After her courses are over, she has lunch and studies a little. Then she goes to work from 2:00 until 10:00.

It's very hard for her to go to school full time and work full time. She does it because she needs the money from her salary, and at the same time she wants to advance her education as quickly as possible. Often she feels tired and frustrated. Carmen passes all of her courses, but her grades are not as high as she would like them to be. She believes this is because she does not have enough time to spend studying. She knows she is not learning as much as she could if she had more time to study.

Her job doesn't pay very much, though it is enough to live on. It's a boring job, but it's the best one she can get because she has no special qualifications.

This is Carmen's life right now. She is beginning to wonder if she is doing the right thing.

Discussion Questions for "Carmen's Problem"

1. Retell the story. What is the story about? What is Carmen's life like? How does she spend her time?

2. Define the problem. What difficulty does Carmen have? How does she feel?

3. Share similar experiences. Do you have this problem? Do you know anyone who is trying to work full time and go to school full time? Do you know anyone who is going to school and raising children at the same time? Is this similar?

4. Fit the problem into its social context. Why does this problem exist? Is this only a personal problem? How much does higher education cost? What funding is available? Is the situation different in other countries?

5. Discuss alternatives and solutions. What are Carmen's options? What choices does she have? How many different possibilities can you think of? What are the consequences of each choice? In other words, if she makes a certain decision, what will it lead to?

Name _____

"Carmen's Problem"

Answer Yes, No, or Maybe.

1. Carmen Hernandez is from Mexico. _____

2. Carmen goes to school full time. _____

3. Carmen is married. _____

4. Carmen likes her job. _____

5. Carmen's job pays well. _____

6. Carmen goes to work in the morning. _____

7. Carmen has to miss lunch. _____

8. Carmen has to miss dinner. _____

9. Carmen is satisfied with her grades. _____

10. Carmen is doing the right thing. _____

Name of the person asking the questions:

_____

Interview on "Carmen's Problem"

1. What's your name?

_____

2. Are you a full-time or a part-time student? _____

3. Do you also have a job? If so, what kind of work do you do and how many hours a week do you work?

_____

_____

4. Do you also have family responsibilities? _____

_____

5. Do you have enough time to study? How many hours a day do you study outside of class?

_____

6. Do you always have enough time to get everything done that you need to do?

_____

7. When you don't have enough time to do everything, how do you feel?

_____

_____