

クリティカル・シンキング・スキルの 教室での使用

Classroom Use of Critical Thinking Skills

学生と教師の調査

Student and Teacher Surveys

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クリティカル・シンキング, 外国語としての英語, カリキュラム,
教室でのやりとり, 日本の大学生

CRITICAL THINKING, EFL, CURRICULUM,
CLASSROOM INTERACTION, JAPANESE UNIVERSITY STUDENTS

ABSTRACT

本稿は、亜細亜大学のフレッシュマン・イングリッシュを受講している1年生351名を対象に、バードと松田によって実施された英語と日本語による授業でのクリティカル・シンキング(CT)の使用に関する調査結果について検討している。アンケートの結果から、学生は日本語の授業よりも英語の授業においてより積極的にCTを使用していることがわかった。ブルームの分類のより高度なレベルのCT活動を行うことについては、学生の反応は消極的になっている。また、単に知識を問う活動よりも内容の理解を問う活動により高い満足度を示している。留学生は、日本人学生よりも頻繁に意見、気持ち、考えを授業で率先して述べたり、教師の期待よりも高いレベルのCT活動に対して積極的な姿勢を示している。これに関しては、留学生の動機付けや本国での教育環境などさまざまな要因が考えられるが、留学生と一緒に授業が、日本人学生にとって異なる文化的価値感や意見を考える機会を与えており、CTを促進する学習環境を提供しているようである。

Introduction

In recent years, a growing number of Japanese students have been participating in study-abroad programs in order to improve their communication skills in English. Japanese students who take standard university classes in the United States or other English-speaking countries often have a hard time keeping up in their courses. Although part of this comes from the use of English, the main reason is often a lack of familiarity with critical thinking and western-style discussion skills, according to Ken Matsuta's experience and teachers associated with Asia University's study-abroad program. Because these skills have not been emphasized in secondary Japanese education, students may not know how to logically analyze and evaluate arguments or to create their own persuasive arguments using expected western forms such as the argumentative essay. Although the Japanese Curriculum Council now recommends a greater emphasis on developing critical thinking skills, it will take sometime before this has been fully implemented in the standard Japanese curriculum (Takemae et al., 1999).

As stated in Kubota (1999), "Asian cultures value conservation of knowledge and favor a reproductive mode of learning which stresses memorization and imitation. In contrast, many Western cultures ... favor an analytic or speculative mode of learning using strategies such as critical thinking and hypothesizing" (p. 13). Therefore, incorporating opportunities for critical thinking in the EFL / ESL classroom is desirable, especially for students planning to study abroad where such skills are expected.

Some may argue that teaching critical thinking is a form of cognitive imperialism,

forcing students to adapt western ideas of critical thinking. However, the Center for English Language Education (CELE) at Asia University (AU) maintains that it is important for students to learn critical thinking skills and to understand different modes of thought in order to empower their functioning within the global community (Morrison and Paullin, 1997). According to Freire and Macedo (1987), "the cultural and linguistic codes of the dominant group need to be demystified and taught so that the subordinate students 'can use the dominant knowledge effectively...' " (as quoted in Kubota, 1999, p. 28).

Kubota (1999) also says that

the teaching of the dominant code needs to be grounded in a critical understanding that no particular culture or language (or variety of a language) is superior to others, that learning the dominant cultural and linguistic codes does not have to mean sacrificing one's cultural and linguistic heritage, and the learner can appropriate the dominant linguistic and cultural codes in order to advocate cultural and linguistic equality in the wider society (p. 29).

Thus, it is important to teach our students to be both aware of and functional in other modes of thought (i.e., critical thinking) in order to empower them for world citizenship.

This paper presents background information on critical thinking and the Freshman English program at AU. It then discusses the feasibility of teaching critical-thinking skills in an English-language program such as that at AU based on the results of a survey of CELE teachers. In addition, we discuss the results of a second survey on how university students use critical thinking skills in their Japanese- and English-language classes. We also make suggestions for future research.

Defining Critical Thinking

There are numerous ever-changing definitions of critical thinking. However, Davidson (1998) states that these definitions are just paraphrases of the same concept and points out “there is very little essential difference in these definitions” (p. 121).

Watson and Glaser (1939) are two of the earliest critical thinking scholars. Their definition of critical thinking is

the predisposition (attitude) and ability (skill) to (a) systematically and logically examine the evidence that supports various conclusions, (b) systematically and logically examine the reasoning that links evidence with conclusions, and (c) produce statements and assertions that are supported by both sound evidence and reasoning. (Garside, 1996, p. 214)

Norris and Ennis (1989) define critical thinking as “reasonable and reflective thinking that is focused upon deciding what to believe or do” (p. 1). They also present an inventory for evaluating critical thinking skills in the classroom. The abbreviated version is

Elementary Clarification

1. Focusing on a question
2. Analyzing arguments
3. Asking and answering questions that clarify and challenge

Basic Support

4. Judging the credibility of a source
5. Making and judging observations

Inference

6. Making and judging deductions
7. Making and judging inductions
8. Making and judging value judgments

Advanced Clarification

9. Defining terms and judging definitions
10. Identifying assumptions
11. Deciding on an action

12. Interacting with others (p. 14).

Norris and Ennis point out that this inventory does not provide an instruction sequence (pp. 10-11). However, it is useful for identifying the variety of skills involved in what we generally refer to as critical thinking.

According to Stephen Brookfield (1991), the components of critical thinking include

1. Identifying and challenging assumptions
2. Recognizing the importance of context
3. Trying to imagine and explore alternatives
4. Imagining and exploring alternatives, leading to reflective skepticism.

Further, this skepticism toward ‘universal truths’ and ‘ultimate explanations’ realizes that our understanding of truth may be based upon distorted assumptions and may change according to a more fully specified context. In addition, a healthy skepticism recognizes that authority figures are not always sources of correct information and that just because something has ‘always’ been done a certain way is not a justification for continuing on in the same way (as quoted in Shoemaker, 1993, pp. 100-101).

Blooms’ Taxonomy and Questions about Critical Thinking

While developing our critical thinking objectives, CELE has relied upon Stephen Brookfield’s (1991) components of Critical Thinking and Benjamin Bloom’s Taxonomy of Educational Objectives. When formulating the questions for Parts 3 and 4 of our 1999 survey, we used nine critical thinking tasks, which (in theory) were listed in order of increasing difficulty. These tasks are related

to the six levels of Blooms' Taxonomy (as given in parenthesis). In our survey, students were asked to indicate which tasks they felt "comfortable attempting" in classes taught using Japanese and English. The tasks in this list were as follows:

1. Memorizing the contents of a text
(**Knowledge-B1**)
2. Reading and understanding the contents of a text (**Comprehension-B2a**)
3. Summarizing, paraphrasing, or restating the contents of a text using your own words (**Comprehension-B2b**)
4. Collecting new information about a topic from materials such as newspapers, magazines, or books in the library
(**Application-B3a**)
5. Using information or ideas from a text to solve a problem (**Application-B3b**)
6. Using information to discuss different solutions to a problem (**Analysis-B4a**)
7. Finding the most important ideas in a text (**Analysis-B4b**)
8. Using learned ideas, concepts, or information to develop a new idea or plan (**Synthesis-B5**)
9. Judging the value of ideas and information and giving reasons for the judgment
(**Evaluation & Appreciation-B6**).

Freshman English at Asia University

Freshman English (FE) at AU is a required yearlong integrated-skills English course. CELE instructors, all native speakers of English, meet students 4 or 5 days a week depending on students' major and selected emphasis. Our students range in ability from true beginners to nearly-native speakers. We

use scores from their FE Placement Tests to place students into twenty-one levels, with Level 1 being highest and Level 21 lowest. Additionally, we identify students who have lived abroad and possess superior English fluency and place them in an Advanced FE course. (The Advanced level is listed in the charts and tables as L0.)

In 1999, AU had close to 2,000 freshmen. Students take classes in groups based on their major (or faculty): Business, Economics, International Relations, or Law. CELE instructors teach one FE level and have up to four FE classes (one in each major).

The initial purpose of the FE program was to prepare students for cultural and academic success in an English-language study-abroad program. Current AU study-abroad programs send students to the United States, other English-speaking countries and several other countries for one or five months of classes. Because these programs are one of AU's strengths, CELE is particularly interested in giving students the skills they need for a successful experience in English-speaking countries.

After surveying faculty, administrators, and students, Morrison and Paullin (1997) updated and expanded the goals and objectives of the FE program. Brief versions of current FE program goals are as follows:

Goal #1: Students will improve their English communication skills.

Goal #2: Students will increase their knowledge and understanding of other cultures.

Goal #3: Students will develop their critical thinking and language-learning skills. (pp. 138-139)

Goal #3 includes following sub-points:

1. Students will increase their use of higher-level thinking skills in English, including analysis, synthesis, evaluation, and appreciation.
2. Students will be able to evaluate their own and others' language, experience, and ideas (e.g. self-evaluations, peer-evaluations, etc.).
3. Students will be able to produce original language to express their ideas and feelings.
4. Students will develop study skills for autonomous, life-long language learning. (p. 139)

Thus, our program's goals reach beyond improving students' linguistic competence to include increasing their communication skills, intercultural understanding, and critical thinking skills.

Our FE classes are highly interactive. There is a high level of teacher-student and student-student exchange with the emphasis on student speech. Students are strongly supported (and even drilled) in asking questions; sentence patterns for classroom questions are often posted in the classrooms. Other class activities include debate, self- and group-evaluations, book and movie summaries and critiques, decision dramas, and journal exchanges with pen pals. Furthermore, we emphasize the acceptability of making mistakes in language learning and guessing — creating comfortable “Mistake zones” and “Guessing zones” in our classes.

At the more advanced levels, we also attempt to create activities where students must make difficult choices between options. Students are asked, whenever possible, to explain or elaborate on their ideas and responses. We also encourage them to think about their own

thinking processes whenever possible. At the highest FE levels, this includes explicit instruction in using critical thinking skills.

1998 Feasibility Survey

In the spring of 1998, the FE Program Coordinator surveyed CELE's 21 teachers about the feasibility of accomplishing the FE program's critical thinking objectives. We asked FE instructors to indicate if the critical thinking objectives could be fulfilled at their students' levels fully (Y), partially (P), or not at all (N), and to give their comments. (FE level 1 is the highest level.) The results, as shown in Table 1, indicate that the critical thinking goals were perceived by teachers to be quite difficult to accomplish, especially at the lower proficiency levels (15-21).

Several teachers' written comments are given below. In response to, “To what degree is it possible to accomplish the critical thinking objectives at your students' English language levels?”, they wrote:

- *“I think that their ability to produce original language to express their ideas and feelings is largely dependent upon their willingness to open up. Maybe as they become more confident in their abilities they will be able to do this.”*
- *“Students are producing some original language, but only after much scaffolding.”*
- *“At the lower levels, it is extremely difficult to think critically in English. Such a goal can be barely introduced, and only with the finest of attention, support, and nurturing.”*
- *“In general, I think the goals are ambitious for my level.”*

We conclude from these and other responses that it is not enough to tell instructors to teach

1998 Teacher Survey—FE Goal #3: Students will develop their critical-thinking skills

		FE Level:																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Students will increase their use of higher-level thinking skills in English, including analysis, synthesis, evaluation, and appreciation.	Y	Y	N	Y	Y	P	P	P	P	P	P	P	P	P	P	Y	P	P	N	P	N
2	Students will be able to evaluate their own and others' language, experience, and ideas (e.g. self-evaluations, peer-evaluations, etc.).	Y	Y	P	P	Y	P	Y	Y	Y	Y	Y	P	P	Y	N	N	P	P	P	P	N
3	Students will be able to produce original language to express their ideas and feelings.	Y	Y	P	P	Y	Y	Y	Y	Y	Y	Y	P	P	Y	N	N	P	P	P	P	P

Table 1 — Feasibility of Accomplishing CT Goals

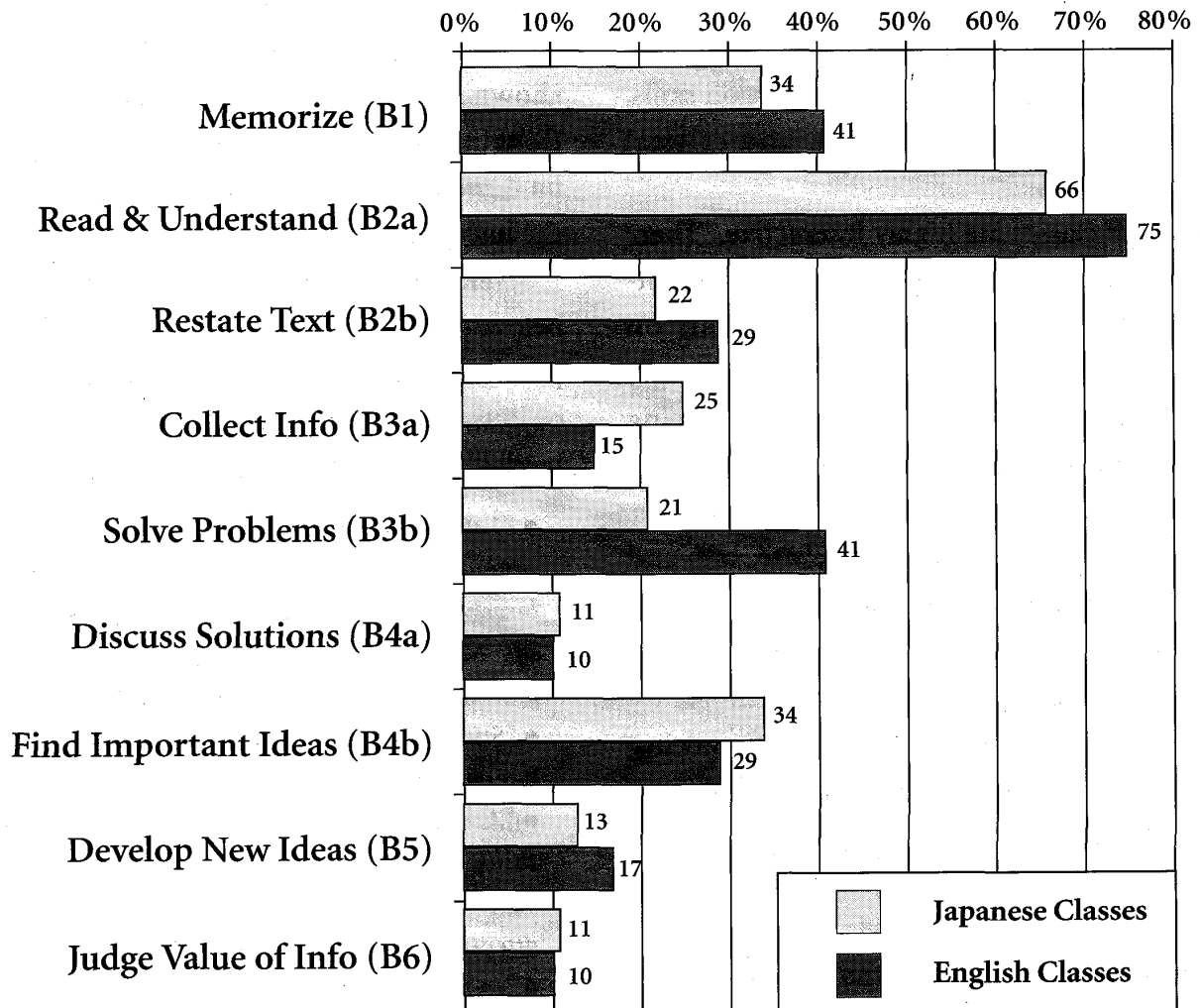


Figure 1 — Student Comfort with Critical Thinking Tasks

their students to analyze, synthesize, and evaluate. It is just as important to define these terms and discuss concrete examples of how to incorporate these skills into the varying levels of ESL / EFL instruction.

1999 AU Student and Teacher Surveys

Early in the 1999 academic year, we surveyed both teachers and their students concerning the use of critical thinking tasks in the classroom. Students were given the written survey in Japanese. We asked students (1) how often they expressed their thoughts and opinions in their Japanese classes and in FE classes and (2) to indicate which critical thinking tasks they felt comfortable attempting in their Japanese-based classes and in FE classes. Teachers were asked which critical thinking tasks students at their FE level were able to do in English. Although these questions are worded differently, insight can be gained from examining the responses.

Our data reflects responses from 351 students, 39 of whom are international students. Appendix A gives the survey results. Appendix B displays these results by student proficiency level.

Comfort Levels with Critical Thinking Tasks

As shown in Figure 1, students reported less comfort attempting tasks rated as more difficult by Bloom's standards; however, our students occasionally differed with him. (In all figures, "Japanese Classes" means classes taught using the Japanese language.)

For example, for classes taught in Japanese and English, 66% and 75% of the students indicated that they are more comfortable with the more difficult task of "reading and understanding a text" than the simpler task of memorizing its contents (34% and 41%). Referring to Bloom's terminology, students found comprehension (Bloom's second level) to be easier than acquiring knowledge (his first level).

Students also reported a relatively high comfort level with problem solving tasks in the English language (41%; Bloom's 3rd level), and reading for important ideas in both Japanese and English (34% and 29%; Bloom's 4th level). Surprisingly, students were less comfortable solving problems in Japanese (21%) than in their English classes (41%). Students expressed the least comfort with discussing different solutions (11% and 10%; Bloom's 4th level), developing new ideas and plans (13% and 17%; Bloom's 5th level), and judging the value of information (11% and 10%; Bloom's 6th level) while using Japanese and English.

Performance in Japanese vs. English Classes

Next, we will look at the differences in students' reported performance in classes held in Japanese and classes held in English. Each of the next questions asked the students to respond with "always, often, sometimes, seldom, or never."

As we look at the numbers from our survey, it is important to remember that the traditional format of Japanese university classes often is not designed for open discourse and the

expression of critical thinking. Therefore, it is difficult to determine if students' lack of expression of critical thinking skills in their Japanese classes comes from a lack of opportunity, a lack of ability, or both. Nevertheless, if students see a difference between their Japanese and their English classes, then we have some indication about how well our FE program is, or is not, doing in creating an environment where students are comfortable asking questions, volunteering opinions, and attempting critical thinking tasks.

The ability to clarify misunderstandings or confusion is fundamental to the development of critical thinking. Question 1 asked the following.

Q1: How often do you ask your teachers questions if you don't understand something?

As shown in Figure 2, students reported more frequently asking questions in their English classes.

For classes in Japanese, the majority of students (61%) **seldom** or **never** asked clarification questions. For classes in English, the majority (68%) **often** or **sometimes** asked questions.

As shown in Figure 3, international students expressed a greater willingness to ask questions in English; 31% said they **always** asked questions and only 5% **never** asked questions, versus 10% and 4% for Japanese students.

However, in Japanese classes, 28% of the Japanese students **never** asked questions. The fact that only 4% of Japanese students **never** ask clarification questions in English may indicate a larger degree of students' involvement in English classes.

Q2: How often do you state your opinions, feelings, or ideas when directly called upon by the instructor?

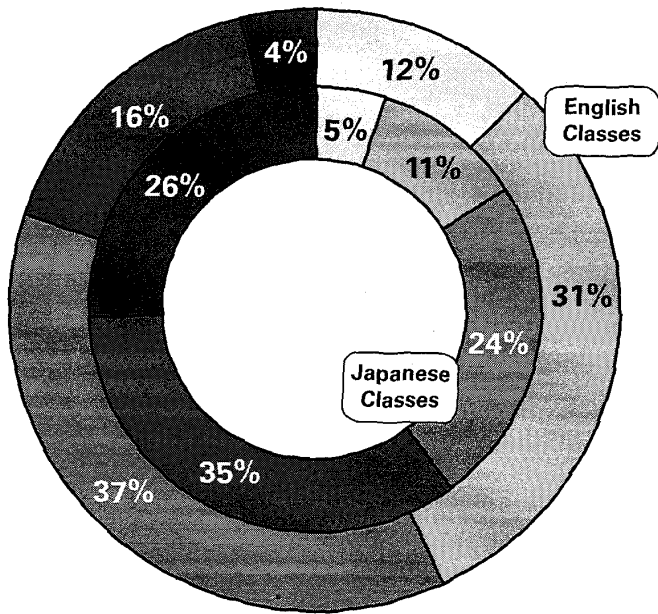
Students also reported giving their opinions, feelings, or ideas more frequently in their English classes (90% versus 71% in the categories of **always**, **often**, and **sometimes**). For classes in Japanese, the majority (50%) **seldom** or **only sometimes** gave their opinions; still 25% **often** gave their opinions when asked. For classes in English, the majority (61%) **often** or **sometimes** gave their opinions; plus, an additional 29% **always** gave their opinions when asked. International students **always** gave their opinion 44% of the time when asked in their English classes.

Q3: How often do you volunteer to state your opinions, feelings, or ideas without being directly called upon by the instructor?

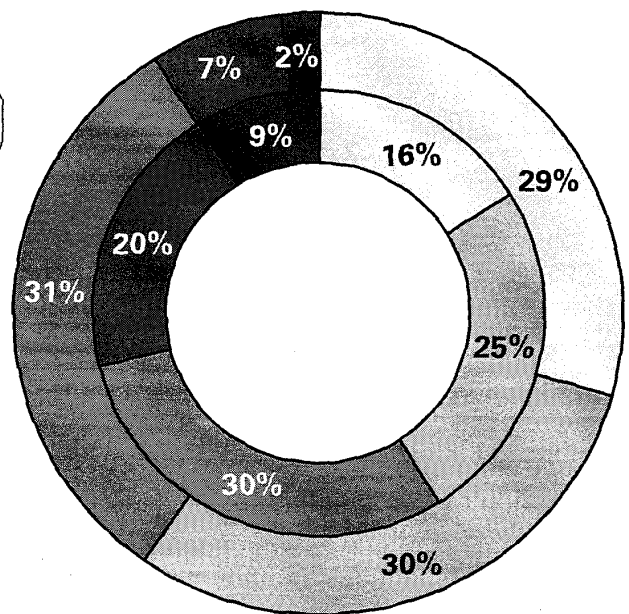
Students less frequently volunteered their opinions, feelings, or ideas, but did so more frequently in their English classes. For classes in Japanese, the majority (77%) **seldom** or **never** volunteered their opinions. For classes in English, this was 52%. Japanese students **never** volunteered their opinions 46% of the time in their Japanese classes. In contrast, international students **always** or **often** volunteered their opinions 36% of the time in their English classes.

Q4: How often do you write about your opinions, feelings, or ideas?

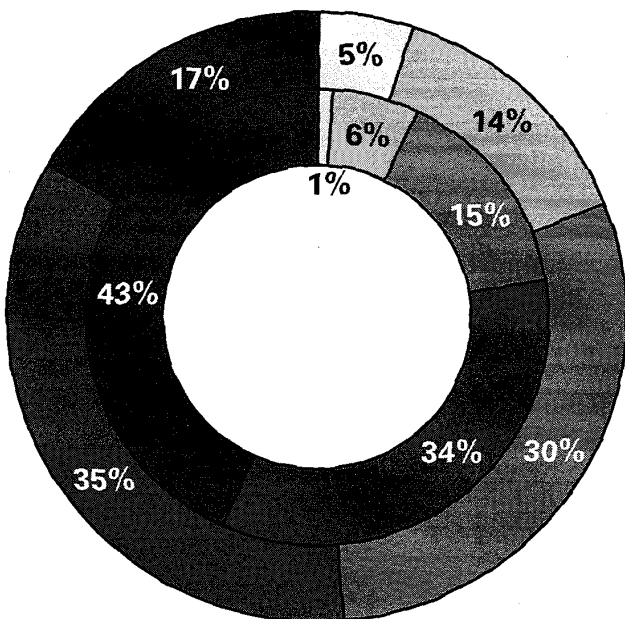
Student responses were more even when it came to writing their opinions, feelings, or ideas. For classes in Japanese, the majority (58%) **seldom** or **never** wrote their opinions, but 24% **sometimes** wrote their opinions. For



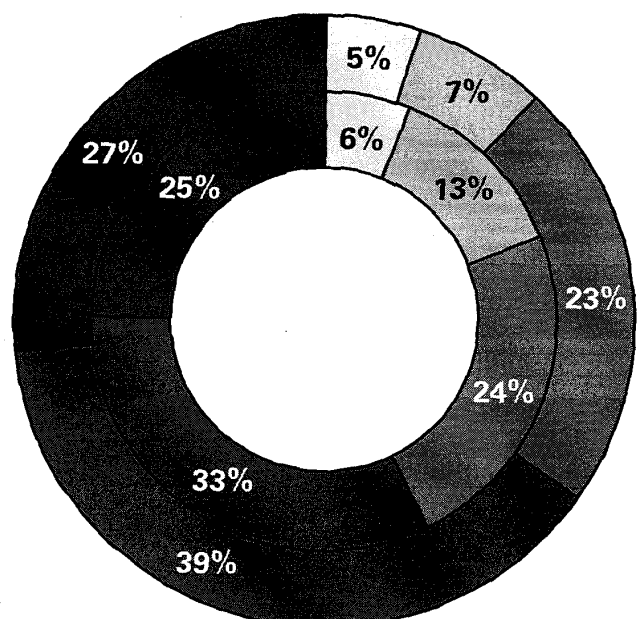
Q 1 : Ask Questions



Q 2 : Give Opinions



Q 3 : Volunteer Opinions



Q 4 : Write Opinions

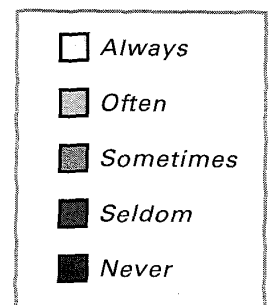
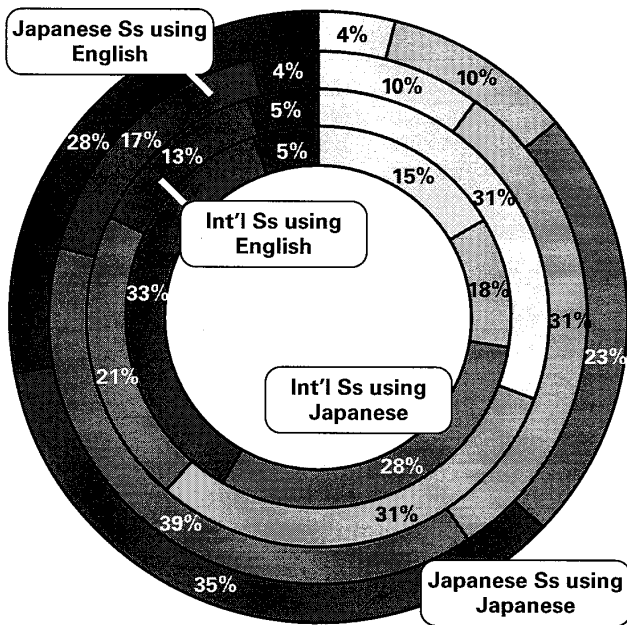
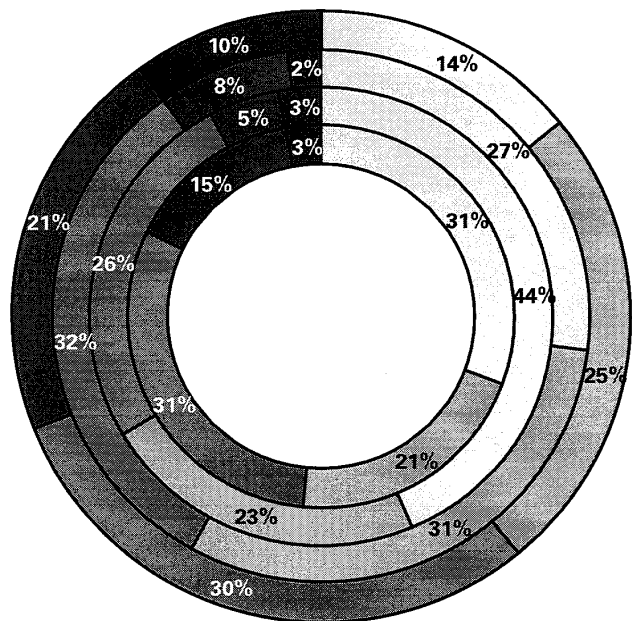


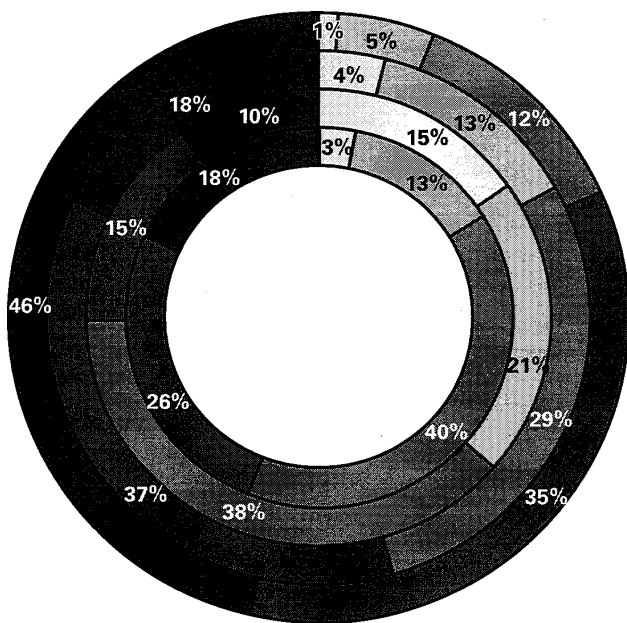
Figure 2 — Frequency in Japanese vs. English Classes



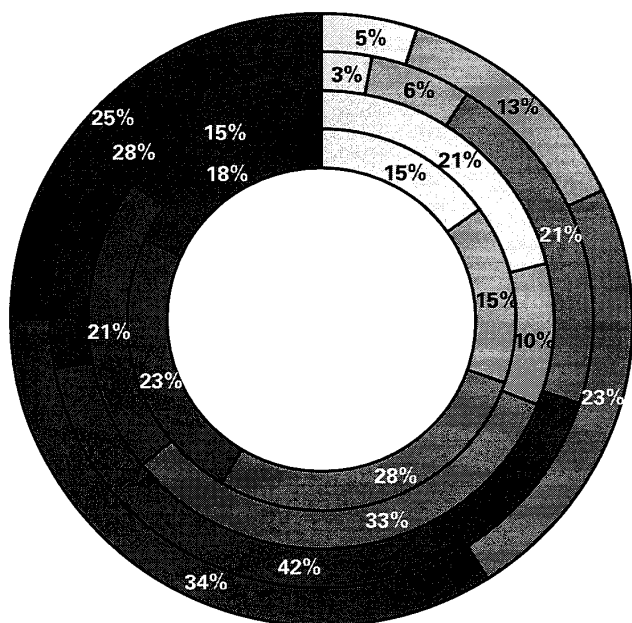
Q 1 : Ask Questions



Q 2 : Give Opinions



Q 3 : Volunteer Opinions



Q 4 : Write Opinions



Figure 3 — Frequency for International vs. Japanese Students

classes in English, these numbers were 66% and 23%. In contrast, international students **always** or **often** wrote their opinion 31% of the time in their English classes.

We propose a couple of reasons why students may have reported writing their opinions, feelings, or ideas less often in their English classes than in their Japanese classes. One reason is: since our FE classes emphasize speaking and listening skills, writing in English is generally limited to journal writing and lessons which focus on writing paragraphs and short essays. Secondly, the less advanced students may find it difficult to express their thoughts and feelings in English due to a lack

of vocabulary and general proficiency.

Teacher vs. Student Perceptions

Finally, we will look at teachers' perceptions of student abilities versus students' comfort attempting critical thinking tasks in the English language classroom. As shown in **Figure 4**, the greatest discrepancy between teachers and students underscores the western stereotype of Asian students as "master memorizers."

The majority of teachers (88%) indicated that their students were able to memorize

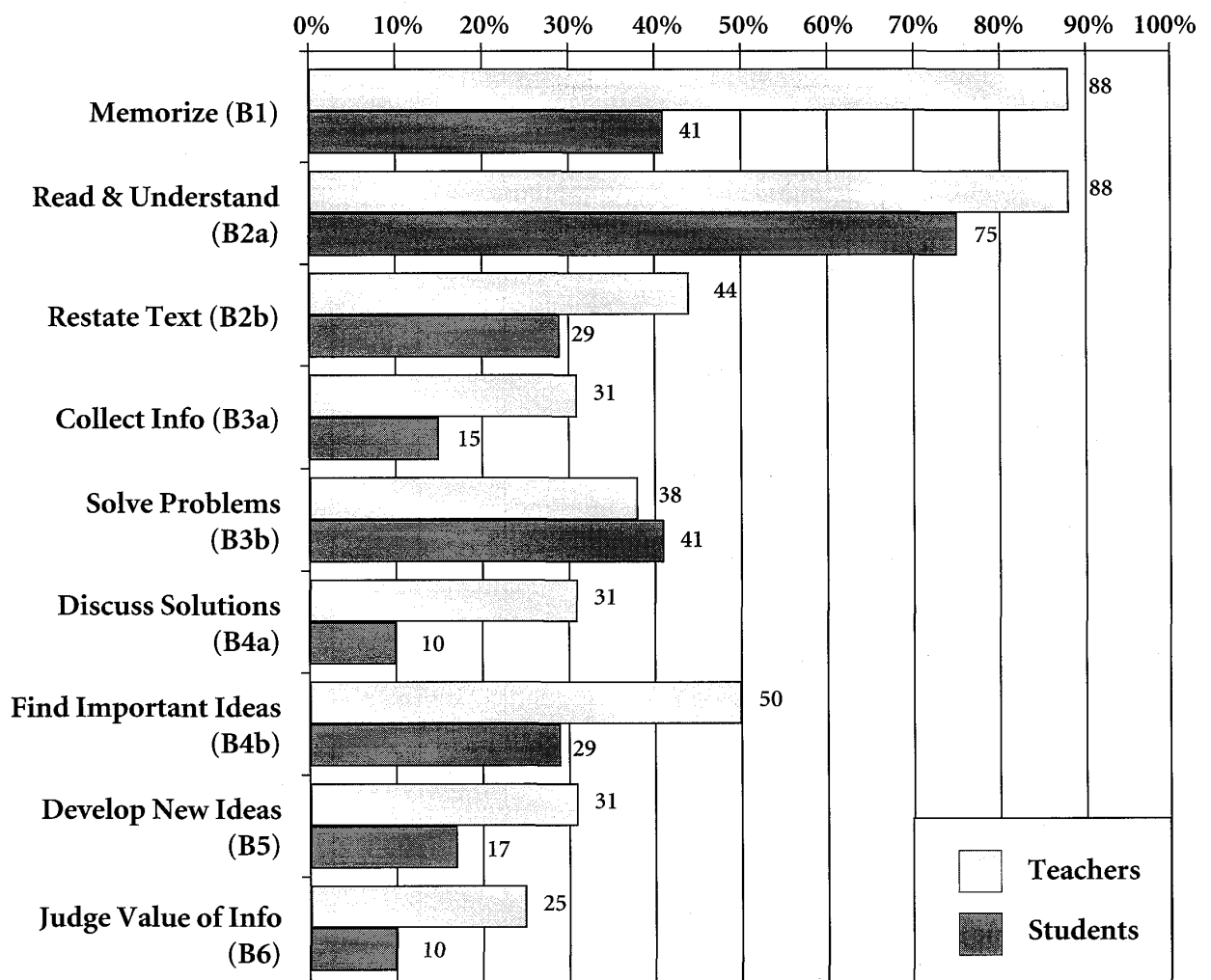


Figure 4 — Teachers vs. Students on Critical Thinking Tasks

texts, whereas only 41% of the students were comfortable doing so. Teachers averaged an 18% higher response than students for all critical thinking tasks except problem solving. For the task of using text to solve a problem, 41% of the students said they were comfortable, whereas only 38% of the teachers said their students were able to perform this task.

Even more unexpected was the differences between students and teachers at levels L18-L21 (the lower levels). As shown in Figure 5, these students consistently reported a greater comfort level (averaging 17% more) than their teachers' perceptions about students' ability to perform critical thinking tasks in English.

For example, in the areas of **finding important ideas** and **solving problems** students reported comfort levels of 48% and 42%, versus teachers' perception that 0% and 25% of students could perform these tasks. In the areas of memorizing, reading and understanding, and restating text, teachers reported 50%, 75%, and 25% ability levels, but students gave their comfort with these tasks as 66%, 91%, and 31%. Teachers at these levels did not think students could perform tasks B3a, B4a, B4b, B5, or B6 (collecting information, discussing solutions, finding important ideas, developing new ideas, and judging the value of information). However,

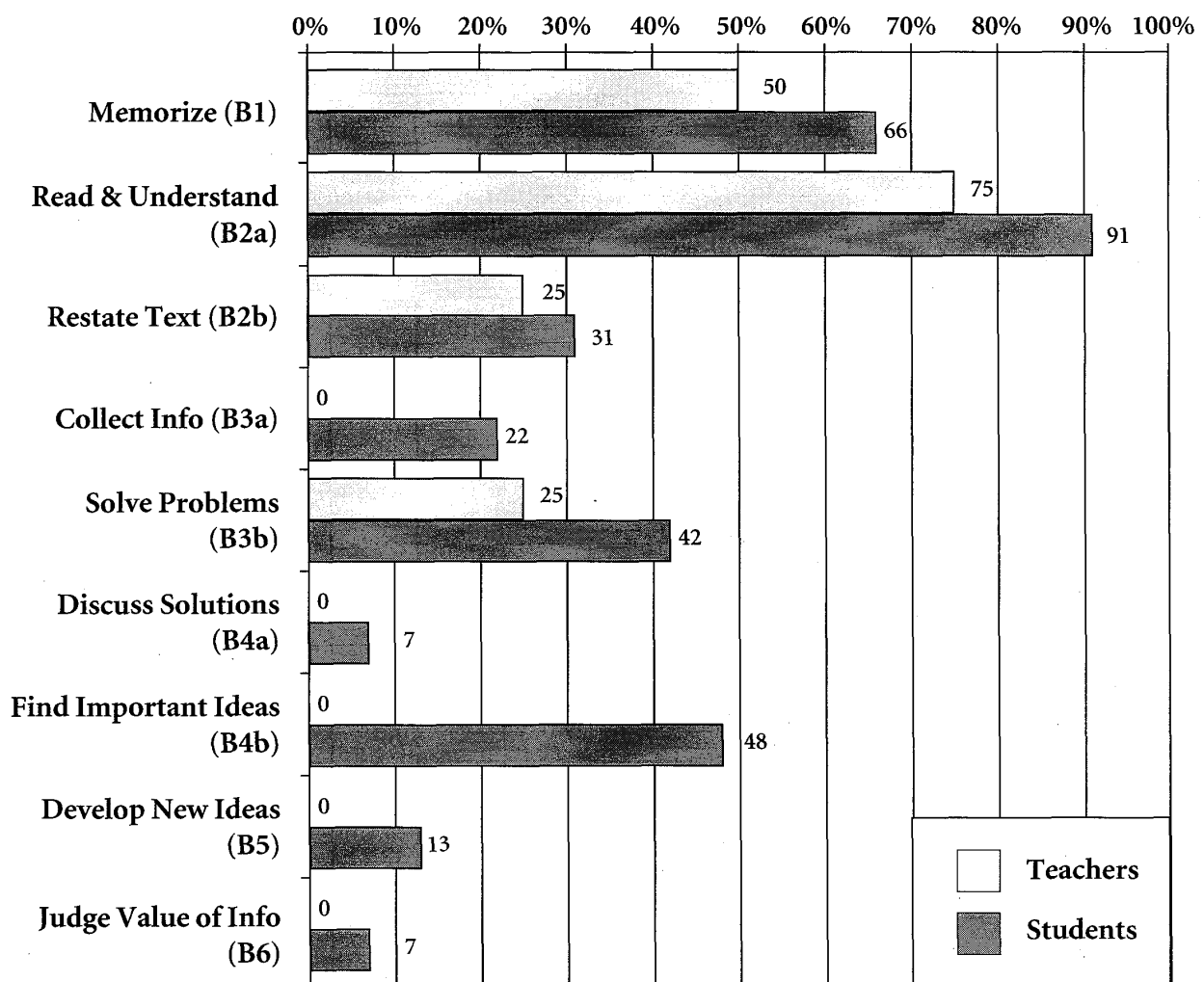


Figure 5 — Teachers vs. Students at the Lower Levels (L 18-L 21)

students reported being comfortable with these tasks 22%, 7%, 48%, 13%, and 7% of the time. Teachers at these levels may need to revise their expectations.

International Students

As a whole, our international students show a much higher level of comfort attempting critical thinking tasks and greater frequency of asking questions and giving opinions in the classroom. Of 351 students surveyed, 39 were international students from countries which include Malaysia, Indonesia, Taiwan, Korea,

Nepal, Hong Kong, Myanmar, Russia, and the People’s Republic of China. Of the 39 international students, 44% were placed in the advanced class and 31% were placed as beginners (levels 18-21). Many of these students are in their middle 20’s and have attended universities in their home countries or abroad. Although they comprise only 10% of the overall student group surveyed, their responses were significantly different from the Japanese students at these levels.

As shown in Figure 6, international students reported a greater comfort level (averaging 2.3 times higher) than our Japanese students towards attempting critical thinking tasks in

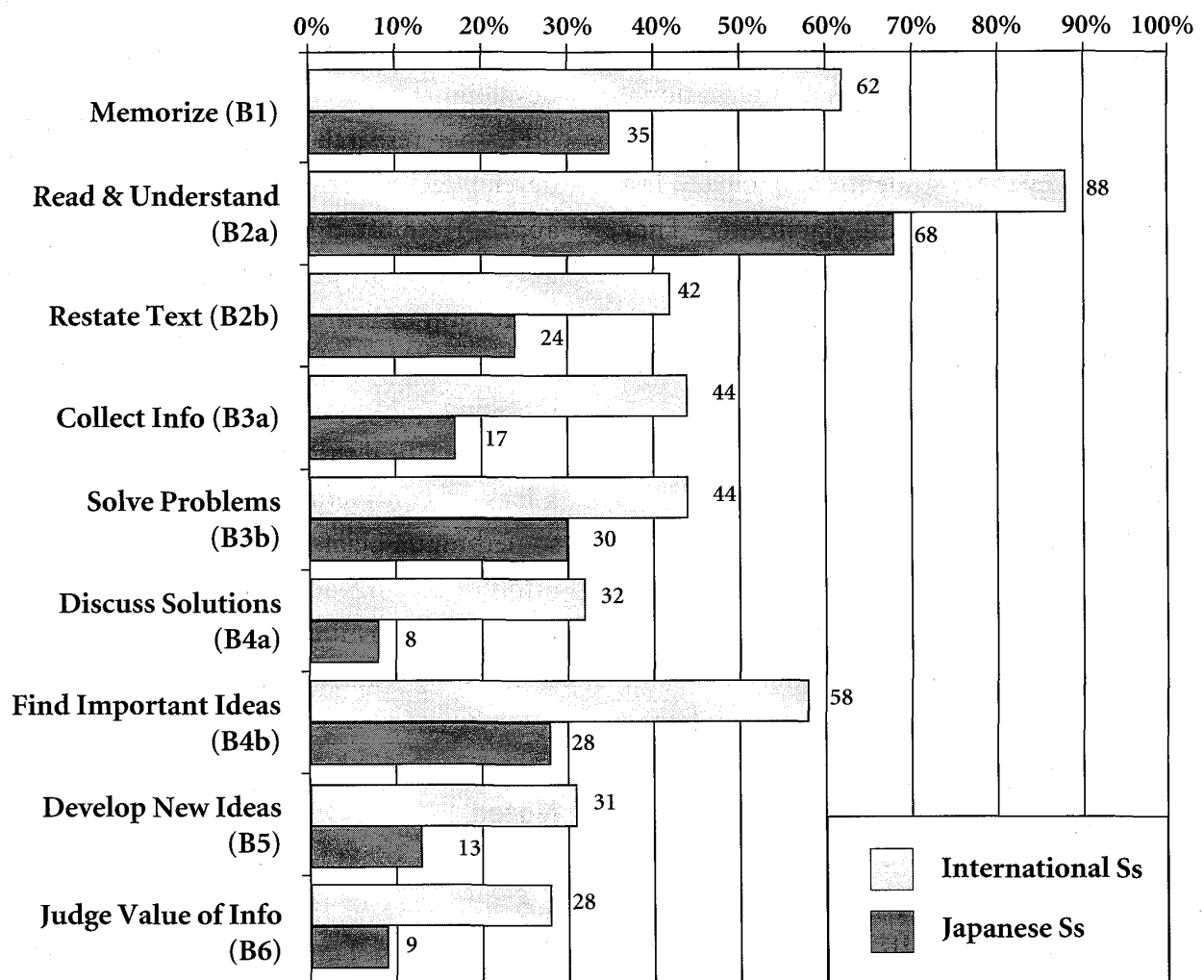


Figure 6 — International vs. Japanese Ss on CT Tasks

classes taught in both Japanese and English.

For most tasks, international students were 1.8 to 4.1 times more comfortable with these tasks. For example, international students reported comfort levels of 58% and 32% for **finding important ideas** and **discussing solutions** versus 28% and 8% for Japanese students.

We hypothesize that these international students' responses may reflect a number of factors. These include students' academic and cultural backgrounds, native linguistic traditions, maturity & experience, or the personality or cognitive traits that may be common to students who are successful language learners and venture to study abroad. In many ways, these survey results confirm what CELE teachers have been perceiving and reporting: that international students, like the occasional older, non-traditional Japanese students, add a lively, less reserved dimension to the classroom. They provide informal peer modeling — encouraging their Japanese classmates to try new ways of responding and interacting in class.

Conclusions

While teaching critical thinking skills, we need to explain to students that these skills are a part of the rhetorical style associated with the English language and the cultures of many English-speaking countries. As Kubota (1999) admonishes, we also seek to teach students that although becoming familiar and proficient in these skills of expression will empower them — it may or may not translate

well into other languages and cultures.

When teaching both a foreign language and its accompanying cognitive style, it is important to keep pace with student comfort levels. It appears that at most FE levels at AU we need to focus on the easier tasks of Bloom's Taxonomy of Educational Objectives before moving up the scale of difficulty. In other words, we need to concentrate on building student confidence in analyzing information in English before asking students to judge the value of ideas.

Based on the results of these surveys, teachers can now have a more concrete sense of what students are comfortable attempting to do in English. From this they can decide where to start building additional skills. CELE will continue to add to this data and convert it into an ongoing source for further curricula development.

Further research is needed to identify and develop techniques and activities that are both appropriate for different English skill levels and which will promote confidence in the expression of critical thinking. We also need to determine the sources of student reticence in asking questions, expressing opinions, and tackling critical thinking tasks — whether it is a lack of confidence, a sense of inability, or something associated with cultural or personal inhibitions. An additional step beyond this will be to determine the most effective means of assessing student progress in these areas.

Notes

A summary of this paper has appeared in the *Proceedings of the AILA '99 Tokyo* (Takemae, et al.; 1999). M. E. Byrd and K. Matsuta

designed and implemented these surveys. J. L. Ware assisted in the data analysis, prepared the graphics, and helped transform their presentation notes into this article.

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Appendix A: Survey Results

Appendix A gives the survey results by level. Student data is separated into Japanese students (Jpn Ss) and international students (Intl Ss) where both were included in the same class level. Student data was also grouped into five levels as follows: L0, L1-L7, L8-L14, L15-L17, and L18-L21. (L0 is the highest proficiency level.) Appendix B displays these results using doughnut charts.

Student Survey Results—Parts 1 & 2

Frequency of Critical Thinking Tasks	All		L0		L1-L7		L8-14		L15-17		L18-21		Jpn Ss		Intl Ss	
	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng
Q1: Ask Questions																
Always	5%	12%	14%	3%	3%	7%	3%	16%	5%	9%	4%	11%	4%	10%	31%	15%
Often	11%	31%	11%	10%	10%	26%	7%	31%	12%	34%	14%	28%	10%	31%	31%	18%
Sometimes	24%	37%	29%	29%	29%	46%	21%	31%	24%	36%	21%	39%	23%	39%	21%	28%
Seldom	35%	16%	34%	21%	21%	17%	44%	14%	30%	20%	43%	18%	35%	17%	13%	33%
Never	26%	4%	11%	37%	30%	4%	25%	8%	30%	1%	18%	5%	28%	4%	5%	5%
Q2: Give Opinions																
Always	16%	29%	29%	14%	19%	25%	14%	27%	19%	34%	12%	26%	14%	27%	44%	31%
Often	25%	30%	29%	27%	25%	33%	22%	26%	25%	31%	22%	26%	25%	31%	23%	21%
Sometimes	30%	31%	23%	20%	24%	31%	39%	36%	24%	24%	39%	38%	30%	32%	26%	31%
Seldom	20%	7%	17%	30%	21%	7%	14%	8%	21%	10%	18%	7%	21%	8%	5%	15%
Never	9%	2%	3%	9%	11%	4%	11%	3%	11%	0%	9%	4%	10%	2%	3%	3%
Q3: Volunteer Opinions																
Always	1%	5%	0%	0%	2%	6%	2%	4%	2%	4%	1%	1%	1%	4%	15%	3%
Often	6%	14%	11%	7%	6%	12%	1%	17%	6%	16%	7%	11%	5%	13%	21%	13%
Sometimes	15%	30%	37%	13%	10%	25%	13%	27%	10%	34%	17%	29%	12%	29%	38%	41%
Seldom	34%	35%	31%	33%	36%	39%	35%	29%	36%	29%	34%	45%	35%	37%	15%	26%
Never	43%	17%	20%	47%	46%	18%	48%	23%	46%	17%	42%	14%	46%	18%	10%	18%
Q4: Write Opinions																
Always	6%	5%	11%	4%	1%	2%	7%	8%	1%	6%	9%	1%	5%	3%	21%	15%
Often	13%	7%	29%	11%	14%	4%	11%	4%	14%	13%	8%	5%	13%	6%	10%	15%
Sometimes	24%	23%	17%	17%	17%	21%	33%	29%	17%	17%	30%	21%	23%	21%	33%	28%
Seldom	33%	39%	26%	43%	32%	33%	32%	36%	32%	37%	30%	51%	34%	42%	21%	23%
Never	25%	27%	17%	24%	36%	39%	18%	23%	36%	27%	23%	22%	25%	28%	15%	18%

Student Survey Results—Parts 3 & 4

Student Comfort with Critical Thinking Tasks	All		L0		L1-L7		L8-14		L15-17		L18-21		Teachers		Ss		Diff		Intl		Totals		Diff		Jpn	
	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng	in Jpn	in Eng
Memorize (B1)	34%	41%	43%	41%	29%	29%	35%	35%	24%	24%	44%	44%	34%	34%	88%	41%	47%	66%	62%	35%	38%	27%	1.8	1.8		
Read & Understand (B2a)	66%	75%	80%	75%	51%	51%	71%	76%	71%	71%	79%	79%	83%	88%	75%	13%	91%	88%	68%	70%	20%	1.3	1.3			
Restate Text (B2b)	22%	29%	43%	29%	17%	17%	20%	24%	17%	17%	23%	23%	51%	44%	29%	15%	31%	25%	24%	26%	19%	1.8	1.8			
Collect info (B3a)	25%	15%	37%	15%	14%	14%	26%	11%	9%	30%	30%	46%	31%	15%	16%	22%	44%	44%	17%	20%	27%	2.6	2.6			
Solve Problems (B3b)	21%	41%	40%	41%	10%	10%	18%	43%	40%	30%	30%	49%	38%	41%	3%	42%	44%	44%	30%	31%	10%	1.3	1.3			
Discuss Solutions (B4a)	11%	10%	23%	10%	9%	9%	11%	7%	8%	14%	14%	31%	31%	10%	21%	7%	32%	32%	8%	11%	24%	4.1	4.1			
Find Important Ideas (B4b)	34%	29%	57%	29%	30%	30%	28%	19%	17%	35%	35%	60%	50%	29%	21%	48%	58%	58%	28%	31%	29%	2.0	2.0			
Develop New Ideas (B5)	13%	17%	31%	17%	4%	4%	11%	14%	12%	22%	22%	49%	31%	17%	14%	13%	31%	31%	13%	15%	18%	2.4	2.4			
Judge Value of Info (B6)	11%	10%	23%	10%	9%	9%	6%	7%	5%	17%	17%	43%	25%	10%	15%	7%	28%	28%	9%	11%	20%	3.3	3.3			

Average 18%

Average 21%

2.3

Appendix B: Critical Thinking Tasks by FE Level

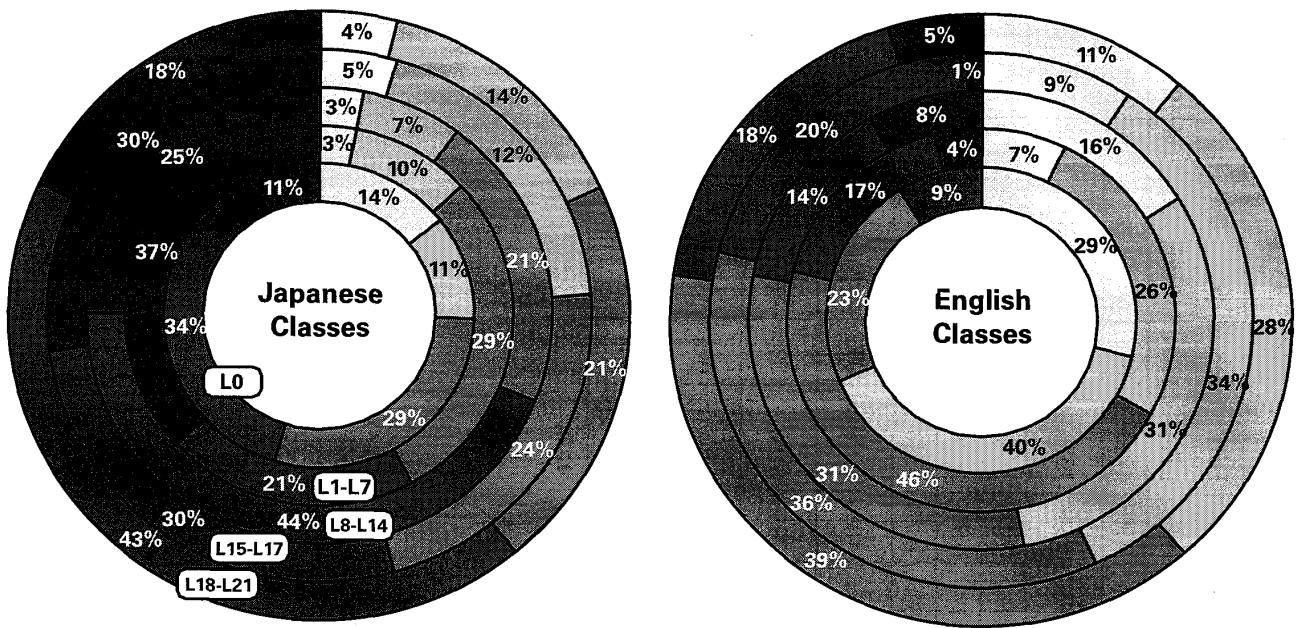


Figure B1 — Q 1 : Ask Questions (by Level)

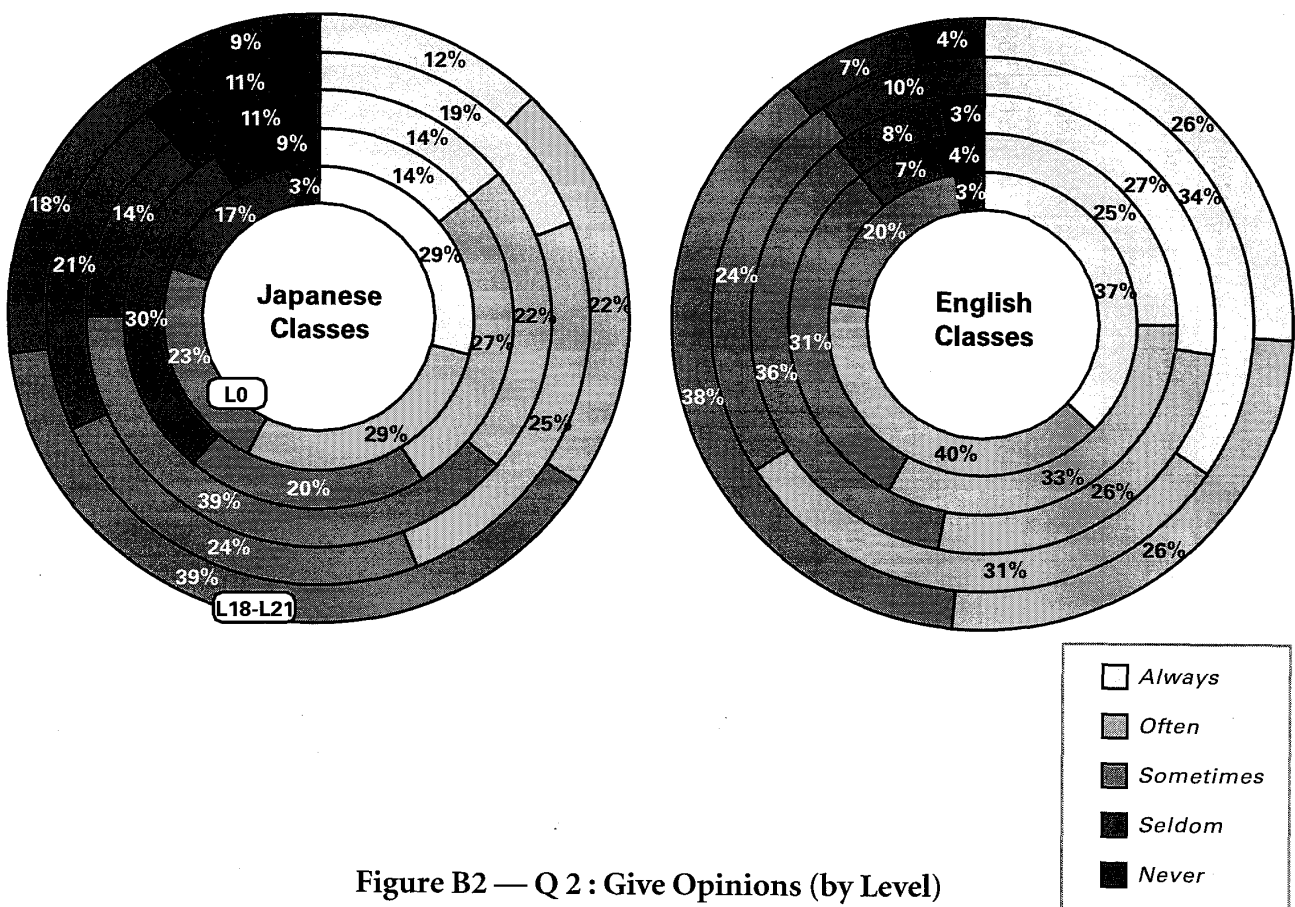


Figure B2 — Q 2 : Give Opinions (by Level)

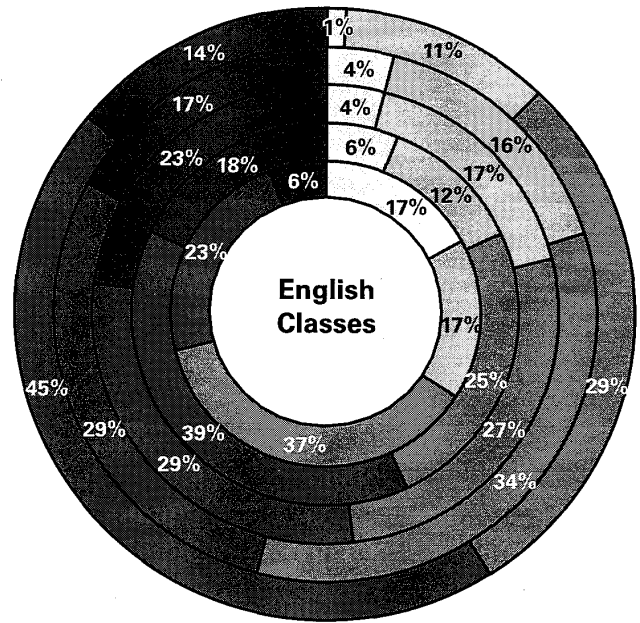
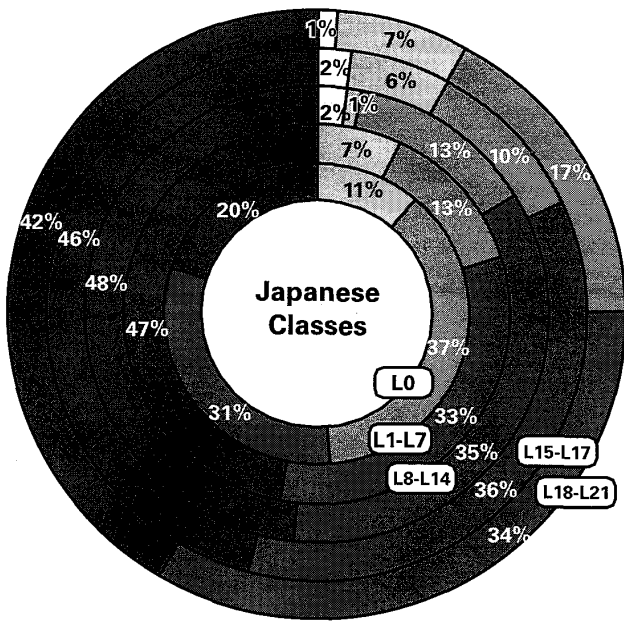


Figure B3 — Q 3 : Volunteer Opinions (by Level)

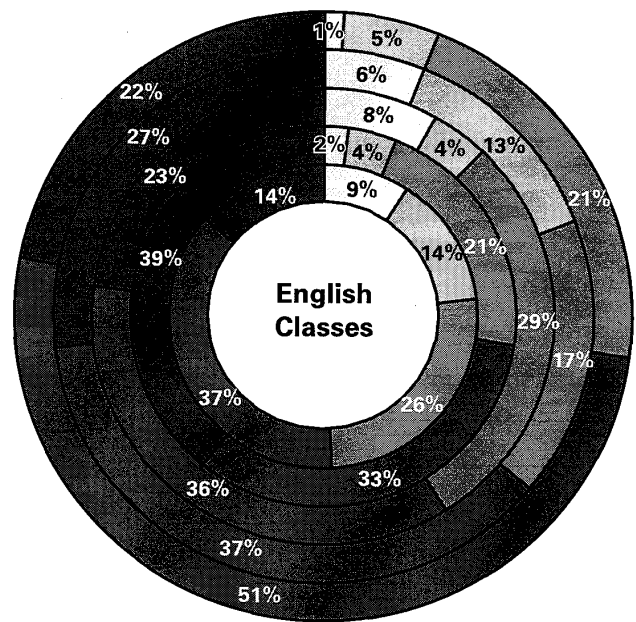
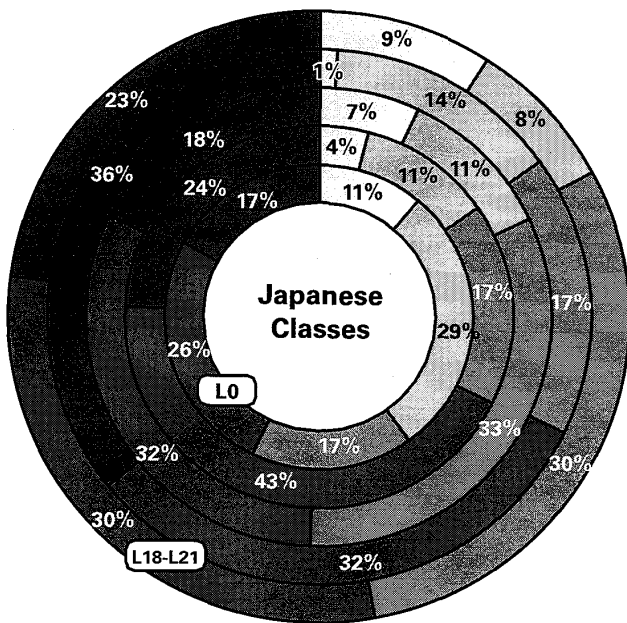


Figure B4 — Q 4 : Write Opinions (by Level)