

# Teaching Japanese Culture in the Technical Japanese Course

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## Abstract

This paper reports a way of teaching Japanese culture through a close examination of science and technology issues in Japan in the Technical Japanese course and of aligning instruction and assessment using Integrated Communication Skills, which help students attain the learning outcomes of the Japanese Studies Program in four years.

**Key words:** alignment of instruction and assessment, culture, Integrated Communication Skills, learning outcomes, science and technology

## 1. Introduction

The present paper reports our curricular work on teaching Japanese culture in the Technical Japanese course at Carnegie Mellon University in the Spring 2013 semester. The purpose of our curricular work is twofold. First, we intend the course to promote deeper understanding of Japanese culture, since it is among those offered by the Japanese Studies Program, which is concerned with the study of Japanese culture and seeks to answer this fundamental question: Who are the Japanese? As Low (2009) notes, science and technology and Japanese culture interact in various ways. The slogan '*wakon yousai*' (Japanese spirit, Western technology), for example, refers to one way of interaction. Learning about science and technology in Japan thus provides valuable insights into Japanese culture.

Second, our curricular work aims to answer the so-called alignment question "How does one ensure that objectives, instruction, and assessment are consistent with one another?"

(Anderson and Krathwohl, 2001, p. 6). On the basis of the intended student learning outcomes set by our department, our colleagues in the Japanese Studies Program and one of the authors developed Integrated Communication Skills, to be discussed in Section 2, as objectives for instruction and assessment in each Japanese course. We have adopted the Skills in our curricular work to ensure a close alignment of instruction and assessment.

The Technical Japanese course is an elective for majors or minors in Japanese. It has 82-272 Intermediate Japanese II (i.e., a fourth-semester course) as a prerequisite and has three course goals<sup>1)</sup> stated in its course description below.

This course seeks to (1) introduce students to technical Japanese or Japanese language used in the field of science and technology, (2) acquaint them with current issues in Japan involving science and technology and (3) deepen their understanding of the science and technology culture of Japan. It draws on various sources of information such as books, newspapers, video clips, and TV news to familiarize them with current issues in Japan related to science and technology. Through understanding those issues, it enables them to acquire necessary knowledge of technical Japanese and Japanese cultural perspectives on science and technology. It also requires them to work on an individual project to form and express their own thoughts and opinions on a science and technology issue of their interest. This course is taught in Japanese. Prerequisite: 82-272 or approved equivalent

The three course goals (1) - (3) above, in combination, help students apply and practice their existing Japanese language skills to new topics and disciplines. The content, science and technology in Japan, therefore, not only serve as the object of learning but also as a vehicle for learning Japanese. The tasks for learning science and technology in Japan require a naturalistic, contextualized, meaningful use of language, wherein language learning most likely takes place.

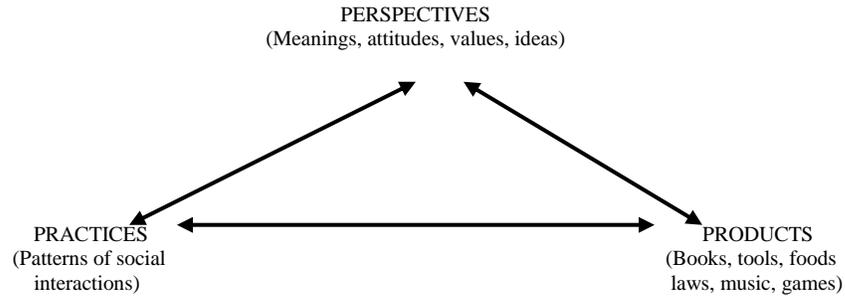
This paper is organized as follows. Section 2 discusses the background assumptions for our curricular work concerning culture and Integrated Communication Skills. Section 3 expounds our curricular work on teaching Japanese culture in the Technical Japanese course in terms of classroom activities, homework assignments, quizzes and presentations, tests, and a final project, showing the way Integrated Communication Skills are acquired and the way instruction and assessment are aligned. Section 4 summarizes students' comments and instructors' reflections on the course. Section 5 concludes the paper by recapitulating the two motivations of our curricular work.

## **2. Background Assumptions**

This section discusses our background assumptions regarding the three components of culture, learning outcomes of our department, and Integrated Communication Skills. The Skills play a pivotal role in helping students study Japanese culture and achieve the learning outcomes.

### **2.1. Culture**

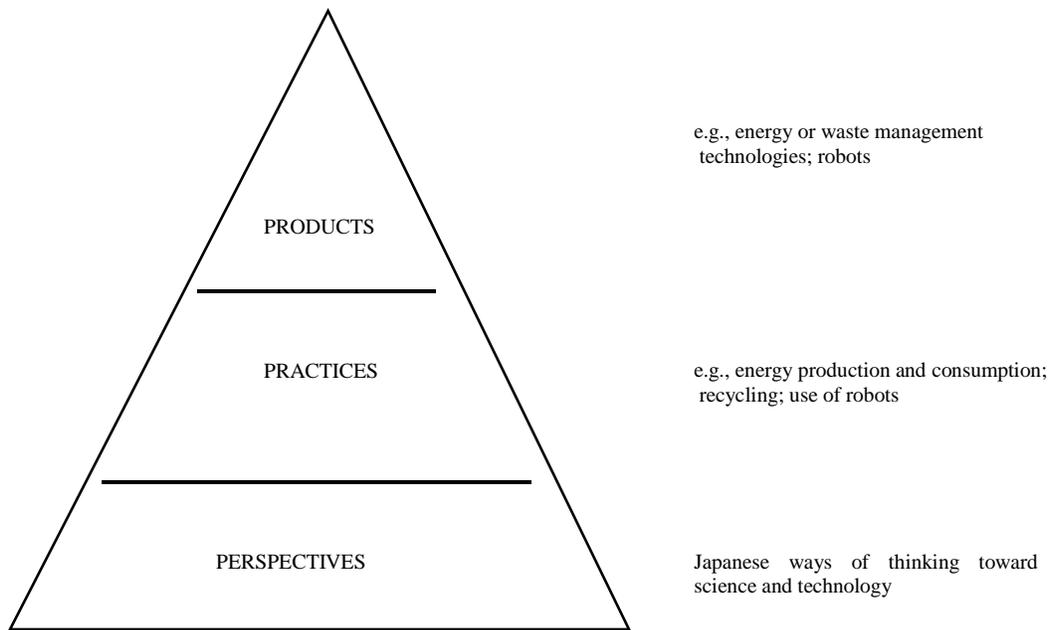
We follow the definition of culture in the National Standards in Foreign Language Education Project (2006, pp. 47-48) in terms of its three components: products (i.e., tangible objects like books and intangible objects like music), behavioral practices, and philosophical perspectives underlying and determining products and practices. The interrelation among them is shown in the following diagram.



**Figure 1. Products, Practices, and Perspectives of Culture  
National Standards in Foreign Language Education Project (2006, p. 47)**

The Cultures Goal (i.e., gain knowledge and understanding of other cultures) has two standards. The first focuses on the relationship between Practices and Perspectives: “Students demonstrate an understanding of the relationship between the practices and perspectives of the cultures studied” (National Standards in Foreign Language Education Project, 2006, p. 50). Practices reflect people’s knowledge of “what to do when and where” and include such behaviors as rites of passage, the social pecking order, and the use of space. The second concerns the relationship between Products and Perspectives: “Students demonstrate an understanding of the relationship between the products and perspectives of the cultures studied” (National Standards in Foreign Language Education Project, 2006, p. 51). Since Products are required or justified by Perspectives and are often used in Practices, the three are closely related. Sample progress indicators for Grade 12 therefore include one addressing the relationship among them: “Students explore the relationships among the products, practices, and perspectives of the culture” (National Standards in Foreign Language Education Project, 2006, p. 52).

We apply the three-component definition of culture above to science and technology culture in Japan, but place the three components in a different configuration, as shown in the triangle below. The examples of Products and Practices<sup>2)</sup> are given on the right.



**Figure 2. Science and Technology Culture**

A useful analogy here is to take the triangle above as an iceberg. Products and Practices are above the water and hence directly observable, while Perspectives are under the water and unobservable. As in any other rational inquiry, our goal is to understand the unobservable through close examination of the observable. To understand Japanese culture, then, is to understand Japanese Perspectives through investigating Japanese Products and Practices thoroughly. The study of culture usually proceeds from observable Products and Practices to unobservable Perspectives. First, our students use language skills or, as we see below, Comprehension to obtain information on Products and Practices from spoken, written, and other materials. Then, they infer Perspectives from the information by the use of thinking skills, which, as we see below, are made up of two processes, Analysis and Reflection. Sometimes, however, the students obtain information on Perspectives directly from materials discussing them explicitly and compare it with their inferences in order to understand Perspectives better.

## 2.2. Integrated Communication Skills

### 2.2.1. Learning Outcomes of Our Department

In 2010, a university-wide learning outcomes assessment started in our university, and toward that end, our department, Department of Modern Languages, reformulated its intended student learning outcomes in the following way.

**Table 1. Learning Outcomes of Our Department**

1	Students demonstrate a depth and breadth of knowledge on social, historical, political, artistic, and cultural themes relating to the peoples who speak the target language.
2	Students demonstrate competence in comprehending, speaking, reading, and writing the target language at the intermediate-high to advanced levels.
3	Students demonstrate research, problem-solving, and critical thinking skills through doing cross-linguistic, cross-cultural, and comparative historical analysis.
4	Students demonstrate independent learning skills and enthusiasm for the field.

The second outcome relates to language learning, while the first and third outcomes are concerned with content learning, dealing with disciplinary knowledge and disciplinary thinking skills or research skills<sup>3)</sup>, respectively. The fourth outcome is thought to be attainable only when the other three are achieved.

Two comments on the outcomes above are in order here. First, they characterize what the graduating majors of our department can do after a four-year study and hence are not easily applicable to instruction and assessment in each Japanese course. Therefore, Integrated Communication Skills, discussed in the next subsection, were developed to help our students reach the level of attainment in the four outcomes above in four years.

Second, the four outcomes as a whole are indicative that our department subscribes to the basic tenet of content-based instruction (CBI), namely “concurrent teaching of academic subject

matter and second language skills” (Brinton, Snow, & Wesche, 2003, p. 2). The use of thinking skills in CBI, however, is taken for granted, as exemplified by Wesche and Skehan (2002, p. 221), which lists, as one of the contextual and pedagogical features shared by different forms of CBI, the “premise that learners in some sense receive “two for one,” that is, content knowledge and increased language proficiency.” Stryker and Leaver (1997, p. 297) mentions thinking skills in its description of CBI: “Given authentic materials, students should be asked to accomplish authentic tasks, using higher order thinking skills and applying the cognitive skills they have acquired in content courses in their own language.” However, the training of thinking skills is not emphasized. Developing thinking skills seems to receive much less attention in CBI than acquiring content knowledge and language skills. In fact, Kondo-Brown (2012, pp. 85-86) notes growing interest among Japanese language teachers in developing methods and materials for fostering critical thinking. To improve thinking skills should be one of the foci of CBI, as knowledge is “an outcome or product of thinking, not a form of thinking per se” (Pohl, 2000, p. 8). In the Technical Japanese course, we have students from the humanities and social sciences as well as natural sciences and use materials for non-specialists. Therefore, unlike content courses taught by content-teachers, the development of thinking skills has to be consciously striven for. This has also led us to adopt Integrated Communication Skills in our curricular work.

### **2.2.2. Integrated Communication Skills**

The Japanese Studies Program adopted the four learning outcomes of the department for its Japanese courses, and some of its members started the Japanese Assessment Project in order to make sure that students attain them in four years. The project has proposed Integrated

Communication Skills (IC Skills), consisting of three kinds of skills as shown below, as objectives for instruction and assessment to be aligned.

**Table 2. Integrated Communication Skills**

Reflection	Reflect on the information, analysis, and evaluation below in light of students' prior knowledge to generate new insights and informed opinions
Analysis	Analyze and evaluate the information obtained
Comprehension	Obtain information from spoken, written, and other materials

Analysis and Reflection include production skills, since their instruction and assessment, by necessity, require their outputs to be verbalized. IC Skills thus integrate communication skills (Comprehension and production) and thinking skills (Analysis and Reflection), giving full weight to the second and third outcomes of our department. They do not directly cover the first or fourth outcome. However, the first one, namely the ability to demonstrate a depth and breadth of knowledge, comes as a byproduct of the training of IC Skills. The fourth will be attained when all the other outcomes are accomplished. In sum, IC Skills set as much store on thinking skills as on communication skills.

Our program devotes Elementary Japanese courses (i.e., the first two semesters) to building Comprehension and production skills. Intermediate Japanese courses (i.e., the third and fourth semesters) provide training in Analysis as well as Comprehension, while Advanced Japanese courses (i.e., the fifth and six semesters) and 400-level courses (i.e., the last two semesters) practice all of the IC Skills.

IC Skills receive preliminary support from the following considerations. First, language learning is requisite for content learning. Second, knowledge is obtained through the use of

communication skills and thinking skills. Third, for content learning to take place, the new information gained from instructional materials has to be reconciled (by Analysis) and assimilated/fused (by Reflection) with prior knowledge and experiences. Fourth, communication/language skills and thinking skills seem to be in a symbiotic relationship, as language and thought are often assumed to interact, for example, in Sapir's (1921, p. 17) words "The instrument makes possible the product, the product refines the instrument," where "instrument" and "product" refer to language and thought, respectively.

### **2.2.3. Further Support for Integrated Communication Skills**

This subsection provides further support for IC Skills by situating them in the context of existing research. We address insights shared with previous research on reading, educational objectives, and the intellectual development of college students.

#### **2.2.3.1. Four Aspects of Reading and IC Skills**

Expanding the role of reading to cover the entire process of learning through reading, Robinson (1960a) posits four aspects or strands of reading, though not all of the authors of the papers collected in it use the same designation for those aspects. For the sake of discussion, we use 'word perception,' 'comprehension,' 'critical reading,' and 'creative reading' for them. Usually, reading refers to word perception and comprehension only, but two further steps, critical reading and creative reading, are added so as to take account of what is involved in learning through reading. The following table gives the description of the four aspects of reading and shows how they compare with IC Skills.

**Table 3. Four Aspects of Reading and IC Skills**

Four Aspects of Reading		IC Skills
Four Aspects	Description of Four Aspects	
Creative Reading (e.g., Wise, 1960, p. 109)	assimilating and learning through reading (Robinson, 1960b, p. 2) develop new insights, reorganize knowledge, create new generalizations and solve problems (Robinson, 1960b, p. 2) assimilation of what is read and is achieved by the fusion of the new ideas acquired through reading with previous experiences (Gray, 1960, p. 9)	Reflection
Critical Reading (e.g., Anderson, 1960, p. 88)	thoughtful and critical reaction to what is read (Robinson, 1960b, p. 2) the reader's reaction to and evaluation of the new ideas secured (Gray, 1960, p. 9)	Analysis
Comprehension (e.g., Gray, 1960, p. 9)	understanding the ideas expressed by a flow of words, whether it be a sentence, paragraph, page, chapter, book or a collection of treatises on a single topic (Robinson, 1960b, p. 2) a clear grasp of the meaning of what is read (Gray, 1960, p. 9)	Comprehension
Word Perception (e.g., Gray, 1960, p. 9)	recognition of the word and knowledge of its meaning (Robinson, 1960b, p. 1) the arousal of both meaning and pronunciation associations (Gray, 1960, p. 9)	

IC Skills are comparable to the above four aspects of reading. Comprehension of IC Skills subsumes word perception and comprehension, and Analysis and Reflection correspond to critical reading and creative reading, respectively. IC Skills, however, are more general because they are intended for learning through listening and viewing as well as learning through reading.

Two comments are necessary here. First, unlike IC Skills, which integrate language skills with thinking skills, Robinson (1960a) includes thinking skills with reading, because the main concern of that work is learning through reading. In fact, some authors in it associate critical reading with critical thinking and creative reading with creative thinking (e.g., Karlin, 1960, p. 74; McCallister, 1960, p. 119). For example, McCallister (1960, p. 123) notes, “The underlying assumption in this paper is that creative reading can be taught by providing learning activities in which the various mental processes of creative thinking are exercised.” Moreover, Reflection and

Analysis differ from creative and critical reading in including production skills. Therefore, IC Skills serve much better as objectives for instruction and assessment than the four aspects of reading.<sup>4)</sup>

Second, critical reading (or Analysis) and creative reading (or Reflection) can be related to the general working of mind. Ruggiero (2012, pp. 7-8) discusses the two distinct phases of mind, namely production and judgment phases, which “complement each other during problem solving and decision making” and are most closely associated with creative thinking and critical thinking, respectively. In the production phase, the mind creates or produces “various conceptions of the problem or issue, various ways of dealing with it, and possible solutions or responses to it.” In the judgment phase, on the other hand, the mind “examines and evaluates what it has produced, makes its judgments, and where appropriate, adds refinements.” Ruggiero’s discussion suggests a possible sequence of the judgment phase (critical thinking) coming after the production phase (creative thinking). We also believe that the sequence is an additional possibility. However, the sequence of critical reading (or Analysis) and then creative reading (or Reflection) has an intuitive appeal, as Pohl (2000, p. 10) observes “Put quite simply, one can be critical without being creative (...) but creative production often requires critical thinking (i.e. accepting and rejecting ideas on the path to creating a new idea, product or way of looking at things).” We will see the same sequence evident in the revised Bloom’s taxonomy in the next subsection.

#### **2.2.3.2. Revised Bloom’s Taxonomy and IC Skills**

IC Skills and the revised Bloom’s taxonomy have the same learning sequence in common. Revising Bloom’s taxonomy of educational objectives, Anderson and Krathwohl (2001, p. 31)

put forward six categories on the cognitive process dimension: remember, understand, apply, analyze, evaluate, and create. These objectives can be construed as intended student learning outcomes. Thus IC Skills are roughly analogous to the educational objectives in the revised taxonomy. The revised taxonomy and IC Skills can be compared in the following way.

**Table 4. Revised Bloom’s Taxonomy of Educational Objectives and IC Skills**

Revised Bloom’s Taxonomy of Educational Objectives		IC Skills
Objectives	Description of Objectives	
Create	Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure.	Reflection
Evaluate	Make judgments based on criteria and standards.	Analysis
Analyze	Break material into constituent parts and determine how parts relate to one another and to an overall structure or purpose.	
Apply	Carry out or use a procedure in a given situation.	
Understand	Construct meaning from instructional messages, including oral, written, and graphic communication.	Comprehension
Remember	Retrieve relevant knowledge from long-term memory.	

Comprehension of IC Skills corresponds to the first two categories, ‘remember’ and ‘understand’<sup>5)</sup> and Analysis to the next three categories ‘apply,’ ‘analyze,’ and ‘evaluate.’ Reflection is equivalent to the highest category ‘create.’ The revised taxonomy and the four aspects of reading in the previous subsection, therefore, share the basic idea of a sequence for learning from obtaining information, to analyzing and evaluating it, and finally to creating something new on the basis of the information, analysis, and evaluation. IC Skills are intended to help students pass through that sequence efficiently, though unlike the revised taxonomy they attach equal weight to and integrate language skills and thinking skills.

**2.2.3.3. Intellectual Development of College Students and IC Skills**

IC Skills accelerate the intellectual development of college students. “Understanding college students’ intellectual development is at the heart of effective educational practice” (Baxter-

Magolda, 1992, p. 3), and IC Skills can be looked at in this broader context of intellectual development of college students. Various models have been proposed for intellectual development of college students (Perry, 1968, 1981; Baxter Magolda, 1992; Kloss, 1994). Perry’s scheme has four phases, which college students are expected to journey through, as shown below.

**Table 5. Perry’s Scheme**

Dualism	Multiplicity	Relativism	Commitment in Relativism
Division of meaning into two realms -- Good versus Bad, Right versus Wrong, We versus They, All that is not Success is Failure, and the like. Right Answers exist <i>somewhere</i> for every problem, and authorities know them. Right Answers are to be memorized by hard work. (Perry, 1981, p. 79)	Diversity of opinion and values is recognized as legitimate in areas where right answers are not yet known. Opinions remain atomistic without pattern or system. No judgments can be made among them so “everyone has a right to his own opinion; none can be called wrong. (Perry, 1981, pp. 79-80)	Diversity of opinion, values, and judgment derived from coherent sources, evidences, logics, systems, and patterns allowing for analysis and comparison. Some opinions may be found worthless, while there will remain matters about which reasonable people will reasonably disagree. Knowledge is qualitative, dependent on context. (Perry, 1981, p. 80)	An affirmation, choice, or decision (...) made in the awareness of Relativism. (Perry, 1981, p. 80)

In the first dualism phase, students, who are mostly fresh out of high school, live in the dualistic world of right or wrong and take their teachers and textbooks as an infallible authority. In the second multiplicity phase, students are exposed to multiple viewpoints and in consequence they are often heard saying “Everyone has a right to his own opinion.” and “Where Authorities do not know the Answer, any opinion is as good as any other” (Perry, 1981, p. 84). In the third relativism phase, however, students “learn to weigh evidence and to distinguish between weak and strong support” (Kloss, 1994, p. 152), thereby coming to know that truth is relative to contexts, situations, etc. In the fourth and last commitment in relativism phase, students commit themselves soberly to a personal worldview in a relativistic world.

Similarly, Baxter-Magolda (1992) proposes the following model for the description of the changes in the way of knowing that students go through.

**Table 6. Baxter-Magolda's (1992) Model**

Absolute Knowing	Transitional Knowing	Independent Knowing	Contextual Knowing
Absolute knowers view knowledge as certain. They believe that absolute answers exist in all areas of knowledge. (p. 36)	Although transitional knowers still believe that absolute knowledge exists in some areas, they have concluded that uncertainty exists in others. (p. 47)	Independent knowing represents a shift to assuming that knowledge is mostly uncertain. ... Differences in the opinions of various authorities represent the range of views possible in an uncertain world. (p. 55)	Thinking for oneself was the hallmark of independent knowing. It remains the defining characteristic of contextual knowing, but there is a change from thinking totally independently to thinking for oneself within the context of knowledge generated by others. (p. 168)

The absolute knowing phase is the same as Perry's dualism phase, and the contextual knowing phase as Perry's commitment in relativism phase. The two intermediate phases in Baxter-Magolda's model are similar to those in Perry's scheme.

IC Skills help students proceed from the initial phase to the final one efficiently in four years. Students use the Comprehension skill to obtain information from spoken, written, and other materials on the assumption that the information is correct, right, or true, just as in Perry's dualism phase and Baxter-Magolda's absolute knowing phase. Using the Analysis skill in a small group discussion activity, students are exposed to diverse viewpoints from peers and other materials and come to a realization, e.g., that the texts' view needs to be qualified, just as in Perry's multiplicity and relativism phases and Baxter-Magolda's transitional knowing and independent knowing phases. In consequence of the realization and by means of the Reflection skill, students generate an informed opinion of their own, just as in Perry's commitment in relativism and Baxter-Magolda's contextual knowing phases. In short, IC Skills parallel Perry's scheme and Baxter-Magolda's model. Each time they deal with a reading passage, a video clip

or other materials using IC Skills, students get experiences similar to going through the developmental phases with the help of the instructor. IC Skills thus facilitate the students' progression through the phases.

### **3. Curricular Work on Teaching Japanese Culture in the Technical Japanese Course**

This section provides a detailed account of our curricular work for teaching Japanese culture in the Technical Japanese course. The account includes classroom activities, homework assignments, quizzes and presentations, tests, and the final project. The learning objectives are:

With adequate in-class and out-of-class study, students will be able to:

- a) comprehend oral and written texts about current issues in Japan involving science and technology
- b) based on the information gained, formulate their own analyses and opinions about Japan's current issues involving science and technology and Japan's science and technology culture
- c) express their own analyses and opinions formulated in (b) in the context of speaking and writing

In terms of IC Skills, Comprehension is involved in a), and Analysis and Reflection in b) and c).

#### **3.1. Classroom Activities**

The course has two main themes: *kankyou mondai* (environmental issues) in Japan with two subthemes, energy and recycling, and *mono-zukuri* (manufacturing) in Japan with two subthemes, robots and *karakuri-ningyou* (wind-up dolls). The teaching materials consist of reading passages, video clips, and a guest lecture by a Robotics Institute visiting scholar. The reading passages are taken from various websites, white papers and other government publications, and newspapers.

All the video clips are available on the web. Those on energy are produced by *Denki Jigyō Rengōkai* (Federation of Electric Power Companies of Japan), and the others are from TV programs.

For all the reading passages and some video clips, we prepared tasks for Comprehension, Analysis, and Reflection of IC Skills, and students worked on them in a small group of three or four. Comprehension tasks concern the content of materials and are made up of Cloze and short-description questions. An example is: List five areas in which “new domain robots” are used. Analysis and Reflection tasks are done via small group discussions, which are then summarized in a whole class format. Analysis often asks students for comparison with their own cultures. An example is: In your own country, what kinds of robots have been developed besides industrial robots? Reflection asks them to think more deeply and respond creatively. An example task is: In your own country, what kind of robots would be useful in order to greatly improve peoples’ lives? The same three types of tasks are used to align learning activities and assessment.

### **3.2. Homework Assignments**

Homework assignments were of two types, preview and review homework. Preview homework assignments are made up of vocabulary questions, Cloze, and short-description questions. All the questions aid students in understanding the reading passages before class and in developing their Comprehension skill. Review homework assignments, on the other hand, are summary essays for the reading passages, which include brief summaries, analyses of the passages, and reflections on them, which provide opportunities for students to demonstrate their IC Skills. Students are given a rubric for evaluation and feedback associated with the summary essays. An example prompt for them is: Write an essay within 500 characters summarizing and reflecting on

discussions with classmates about the reading “What is a robot?” comparing robots in Japan and your own country, and your own opinion about ideal future relations between humans and robots.

### **3.3. Quizzes and Presentations**

The course has three types of quizzes: eight *tango* (vocabulary) quizzes, two graph quizzes, and two *suuji* (number) quizzes. The *tango* quiz has two -- vocabulary and technical term -- sections. The technical-term section is designed not only to check if students understand the meaning of technical terms from the reading passages but also to help them recognize the conceptual relationships among the terms. The technical-term section of *tango* quizzes, graph quizzes, and *suuji* quizzes are intended to accomplish the first goal of the course, namely to introduce students to technical Japanese or Japanese language used in the fields of science and technology.

Students are required to make four one-or-two-minute presentations of graphs/tables/images, in which they show non-text materials, briefly describe them in Japanese, and take questions from the classmates in Japanese. The purpose of the presentation is threefold: to acquaint students with graphs, tables, and images in science and technology, to foster their ability to comprehend non-linguistic materials and verbalize their content, and to enable them to bring their own interesting content to class.

### **3.4. Tests**

The course has two in-class tests, Unit 1 Test for *kankyou mondai* and Unit 2 Test for *monozukuri*, consisting of graph questions, number questions, Cloze, short-description questions, and essay questions. Cloze and short-description questions check students’ Comprehension skill and essay questions assess all of their IC Skills, thereby aligning assessment with learning activities.

### **3.5. Final Project**

Students are required to complete a final project within 3000 characters for the course and, for the project, have to select a topic about science and technology in Japan. The project lays special emphasis on students' personal engagement with the topic of their choice and consists of five stages: Topic, Outline, First Draft, Second Draft, and Final Draft with an oral presentation at each stage. It helps students to learn more about science and technology in Japan and develop speaking as well as writing skills. The project has students comprehend and gather information from materials they choose themselves, analyze it, and reflect on it, thus affording them another opportunity to develop their IC Skills and aligning assessment with learning activities.

At the topic stage, students write a one-page topic sheet with (1) a topic question, (2) reasons for selecting the topic, (3) what they already know about the topic, (4) what they want to know about the topic, and (5) how to gather information on the topic. The Topic presentation is a one-minute presentation with (1) student's name, (2) topic question, and (3) reasons for selecting the topic, ending with a concluding word *arigatougozaimashita* 'thank you' and a bow. Students use no visual aids and present from memory.

The Outline is a one-page sheet with three sections: Introduction, Main body with three to five subsections, and Conclusion. Introduction includes the topic question, reasons for selecting the topic, and the tentative answer to the topic question. In Main body, students fill in the section heading and the subsection headings. The section heading is the topic question, while the subsection headings are subtopic questions, into which the topic question is broken down.

Conclusion repeats the tentative answer in Introduction and adds a suggestion, proposal, or solution, if any. The Outline presentation, being two minutes long, is made up of (1) student's name, (2) title of the presentation, (3) topic question, (4) subtopic questions, and (5) tentative answer to the topic question, concluding with *arigatougozaimashita*. Again, students present from memory without using any visual aids.

The first draft (about 2000 characters long) and the second and final drafts (each about 3000 characters long) are based on the outline above. For their presentations, students can use cards and have to prepare PowerPoint slides. The first and second draft presentations are about three minutes long, while the final draft presentation is about eight minutes long.

#### **4. Students' Comments and Instructors' Reflections on the Course**

##### **4.1. Students' Comments on the Course**

Twelve students took the course in Spring 2013. Eight were from computer science and engineering departments and four from humanities and social sciences departments. There were no Japanese primary majors, two secondary majors, and seven minor students. Among the students were seven Americans, two Koreans, and one each from China, Singapore, and India. Their Japanese language levels varied from Intermediate-Low to Advanced-Mid.

We collected student feedback formally by two instruments: the university online faculty course evaluation and the department supplemental faculty course evaluation. Ten out of twelve students completed the university's FCE and rated the course as 3.8 of 5. The rating 3.8 is below the median of scores for courses offered in our department and so is not a glowing review, but is not bad. Eleven of the twelve students filled in the pencil and paper department supplemental

FCE, done in class with the instructor absent. This department supplemental provides more narrative comments, which are more useful than simple numerical ratings.

The students' positive comments identify the following areas of satisfaction: (1) interesting topics (especially robots) dealt with in the course, (2) increased interest in the relationship between culture and technology, (3) knowledge of Japanese technology and vocabulary is useful for future study and work, and (4) the freedom to research any topic regarding science and technology in Japan.

Students' complaints identify the following areas of dissatisfaction: (1) too many quizzes and presentations, (2) too much and too specialized vocabulary for quizzes, (3) repetition of homework and in-class work being dull, (4) small group discussions becoming dull when classmates did not participate, (5) some topics (e.g., recycling) not interesting, and (6) some materials dated. Regarding (5), ironically, two students chose the topic of recycling for their final projects, wanting to pursue it more deeply than was done in class, demonstrating that not everyone thought the topic was dull. Regarding (6), no examples of dated materials were given, but we think this refers to some videos and readings about energy that predated the 2011 Great East Japan Earthquake.

#### **4.2. Instructors' Reflections on the Course**

We instructors think that the learning objectives (Section 3, above) were achieved. The assessments provide evidence for this. Notably, the quality of students' reflections, as demonstrated in their essays, deepened in response to instructor feedback. The formal feedback students provided in the online and supplemental FCEs complemented our own observations of student successes and challenges. As for the issue of class/group discussions becoming dull when

classmates do not participate, we attribute the inactive participation to such factors as lack of background knowledge in L1, a wide range of individual variation in Japanese language proficiency, and so much new vocabulary. One way to address the issue is to review the new vocabulary right before the class/group discussion. Also, we can encourage students to utilize online text-to-speech applications to hear and say the vocabulary as they read it. About the students' complaint of vocabulary being too specialized, we think the vocabulary is actually not too specialized. Rather, they are everyday vocabulary, appearing in articles on science and technology written for the lay person. None of our texts were written for specialists.

Some future actions we are entertaining to address the feedback include (1) keeping the same number of quizzes but simplifying the vocabulary tested, (2) keeping all graph/image presentations, but eliminating the second draft presentation because it largely overlaps the first draft presentation, (3) better explaining reasons for repeating homework activities in class and also revising the repetitive parts of the classwork to make repetition less obvious, and (4) updating the energy and recycling video and reading materials to include more post March 2011 data and perspectives.

In Spring 2013, the course was co-taught by both authors. The course was enriched by our differing perspectives, one of a Japanese native specialist in Japanese language pedagogy with little affinity for technology prior to this course, and the other of an American, with a professional interest in Japanese technology and policy. Iwasaki was responsible for curriculum development. Litt assisted with materials development. Delivery of instruction and of assessment was shared. Throughout the semester, the instructors met weekly to discuss and coordinate. Although there were benefits to co-teaching, in the future the course will be taught by a single instructor. Co-teaching during the initial offering of the course enabled curriculum development

to continue in real time, while providing training for the junior instructor (Litt). We are grateful to the Department of Modern Languages for supporting us in this work.

## **5. Conclusion**

Our curricular work for the Spring 2013 Technical Japanese course has sought to achieve two objectives. One is to help students understand Japanese culture better through investigating science and technology issues in Japan. Those issues shed light on Japanese culture, since science and technology and Japanese culture interact in various ways, as Low (2009) notes. Defining culture in terms of three components, namely Products (i.e., tangible and intangible objects), Practices (i.e., patterns of social interactions), and Perspectives (e.g., meanings, attitudes, values, ideas), National Standards in Foreign Language Education Project (2006) proposes that the goal is to gain knowledge and understanding of other cultures by understanding the relationship among the three. Applying this three-component definition of culture to science and technology culture in Japan, we have our students first obtain information on Products and Practices from spoken, written, and other materials regarding science and technology issues in Japan. From the information, students then infer Perspectives. In the case of materials discussing Perspectives explicitly, students gather information on Perspectives directly from them and compare it with their inferences in order to understand them better.

The other is to answer the alignment question “How does one ensure that objectives, instruction, and assessment are consistent with one another?” (Anderson and Krathwohl, 2001, p. 6). We answer it by employing Integrated Communication Skills (IC Skills) as objectives for instruction and assessment. IC Skills were developed to attain the learning outcomes of our

Department of Modern Languages and Japanese Studies Program, which specify what our majors should be able to do upon completion of our four-year undergraduate program. Integrating language skills and thinking skills, IC Skills help students reach the level of attainment set in the learning outcomes in four years. They are made up of three skills, Comprehension, Analysis, and Reflection. Comprehension, being receptive language skills, enables students to gain information on Products, Practices, and Perspectives from instructional materials about science and technology issues. Analysis and Reflection are thinking skills with productive language skills included so that they can be instructed and assessed. Analysis first provides an analysis and evaluation of the information gained and then makes possible inferences from Products and Practices to Perspectives through comparison of Japanese Products and Practices with those of students' culture. Finally, Reflection induces students to reflect on the information, analysis, and evaluation in light of their prior knowledge and to generate new insights and informed opinions about Japanese Perspectives. In this way, students use both language and thinking skills or IC Skills to study Japanese culture, and IC Skills ensure close alignment of learning activities and assessment.

## **Notes**

- 1) The course goals are from the instructor's point of view and so are distinct from learning objectives or outcomes for the students, which we will discuss later in Section 3.
- 2) Note that this breakdown of products and practices is somewhat pedantic; for example, systems implemented in a society, such as energy delivery systems and recycling systems can be considered as either products or practices. We are not strictly concerned with categorizing things as products or practices. Rather, we observe and consider them in order to infer perspectives.

3) Though some people may be hesitant about teaching research skills to undergraduate students, we have at least three reasons for doing so. First, we concur with Booth, Colomb, and Williams (2003, p. xii) that “the skills of doing and reporting research are not just for the elite; they can be learned by all students.” Second, Novak and Gowin (1984, p. 8) classifies learning activities along two dimensions: rote learning vs. meaningful learning dimension and reception learning vs. autonomous discovery learning dimension. Learning of multiplication tables, for example, exemplifies rote and reception learning. The opposite case, which is an example of meaningful and autonomous discovery learning is scientific research (and new music and architecture). In other words, research is the most advanced form of learning activity and is an ideal candidate for independent learning skills in the fourth learning outcome of our program and department. Third, research is the most reliable learning activity producing accurate knowledge based on cogent evidence and freeing us from ignorance, prejudice, and misunderstanding. The question, therefore, is how to help students learn research skills. We think Integrated Communication Skills will serve that purpose.

4) In language teaching, it is convenient to assume that language skills and thinking skills are distinct skills. However in reality, there seems to be considerable overlap between them, with thinking skills permeating language skills. Even our Comprehension skill can be a combination of language skills and thinking skills. See the next note for more discussions.

5) In the revised taxonomy, ‘understand,’ which corresponds partly to our Comprehension, stands on a par with other thinking skills like ‘analyze’ and ‘create,’ even though its description includes oral and written communication in addition to graphic communication. In the case of oral and written communication, language skills are necessarily involved. In the case of graphic communication, by contrast, language skills are irrelevant. One way to provide a uniform

account for both cases is to assume that oral and written communication requires both language skills and thinking skills, while graphic communication needs both hypothetical ‘graphic’ skills and thinking skills, and that ‘understand’ is complex skills made up of thinking skills and either language skills or graphic skills. This account, in essence, implies a complex nature of our Comprehension, which is now reanalyzed as a complex of language/graphic skills and thinking skills. This reanalysis, in turn, suggests that language skills (i.e., reading, listening, writing, and speaking) have thinking skills as their proper subset. This is still a speculation and we leave the resolution of this issue for future research.

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