

# Communication Methods for International Technical Cooperation

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Owing to the economic recession, Japan has decreased its budget for official development assistance (ODA), and we cannot expect an increase soon. Therefore, the experimenters considered it important to determine what to do to achieve more effective international cooperation with a limited budget.

In financial cooperation the budget is relative to the effect, but in technical cooperation this is not always so. We cannot expect experts on the same salary to work at the same level. If we can improve experts' ability, the effects of international cooperation will increase.

An expert tries to conduct the transfer of technology using his or her own knowledge and experience in a specific field. The object of transfer may be called technology, knowledge, know-how, skill, etc., but the basic element of these objects is the aggregate of information. And "giving information" is the definition of "communication."

In the process of communication an expert with an ability conveys information to a counterpart with a schema. If we can improve the ability of the expert or the schema of the counterpart, international cooperation will be more efficient.

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On the basis of the above statement, the experimenters proposed the hypothesis, “In the transfer of technology for international cooperation, a counterpart who has a higher degree of schema about the technology has a higher degree of comprehension.” And as a first step, they conducted an experiment at the National University of Samoa. The result was not significant, but there was an acceptable tendency in the hypothesis. Therefore, the experimenters consider it important to continue this study.

## I. Introduction

The authors both work in the Department of International Cooperation, Faculty of International Studies, Keiai University, which was established in April 1997 to strengthen human resources for more efficient international cooperation.

Katsurai has worked at the Japan International Cooperation Agency (JICA) for 21 years in the field of agricultural development, and Yanagihara, majoring in educational technology, has worked at Chiba Keiai Junior College as an English teacher. Now we are trying to find ways to improve the quality of international technical cooperation through this joint research combining the know-how of international cooperation and educational technology.

### *1. Categories of international cooperation*

International cooperation consists of ODA by the government and the activities of non-governmental organizations (NGOs).

Japan's ODA began in 1954, when it joined the Colombo Plan, established in 1950 with the aim of assisting the socioeconomic development of Asian countries. Later, Japan expanded its ODA budget and became the top donor in terms of net disbursement.

The fundamental principles of Japan's ODA are humanitarian consideration and recognition of global interdependence. Its guiding principles are:

- (1) Japan will contribute to alleviating starvation and poverty.
- (2) Japan recognizes that the stability and development of developing regions are essential to world peace and prosperity.
- (3) The global problems of environmental degradation and overpopulation affect all humanity.
- (4) Japan will assist developing countries in their own efforts to accomplish economic improvement.
- (5) Japan will share its development experience with other countries, including human resources development.

Owing to the economic recession, Japan has decreased its ODA budget. Japan's *ODA 1997* summary, published by the Ministry of Foreign Affairs, reports that the ODA budget will be decreased each fiscal year during the intensive reform period through a shift in emphasis from quantity to quality. In particular, the fiscal 1998 ODA budget will not exceed the fiscal 1997 budget.

It seems that the materialization of this shift from quantity to quality will not be easy, because such a shift requires the improvement of human resources.

There are many types of cooperation. If we classify international cooperation by amount of money, the results are as follows:

US \$	Budget category	Examples of cooperation
More than 10 million	Low interest-rate loans (yen credit)	Construction of dam, road, bridge, port facility, etc.
1–10 million	General grant aid  Technical cooperation projects	Construction of school, hospital, etc. Vocational training center, model farm, etc.
100,000–1 million	Providing equipment Dispatching experts Accepting trainees	Medical equipment Civil engineer School teacher
10,000–100,000	Grass-roots grant aid  NGO aid	Construction of school laboratory Supply of food and medicine

Also, for convenience, we divide international cooperation into financial cooperation and technical cooperation. As the cost of technical cooperation is paid by the budget, technical cooperation is also supported financially by the Japanese government.

The payment of financial cooperation is made directly to the general contractor or supplier of merchandise, and the effect of cooperation is generally linked to the budget amount. (If the scale of the dam is bigger, the general contractor asks for a larger budget.) But the payment of technical cooperation covers the expenses of an expert (salary, housing allowance, etc.) or training of a participant (airfare, hotel, etc.), and we consider that the quality of technical cooperation is not directly linked to the budget amount. (We cannot expect experts on the same salary to work at the same level.)

In this circumstance, if the ODA budget is fixed, we should give more training to experts and ask them to perform more efficiently.

## *2. Contents of technical cooperation*

The two basic items of technical cooperation are the expert dispatch programs and the programs for accepting trainees. Both programs aim at transferring technology through experts and trainers, such as teachers in the school. This process of technology transfer can be understood as the process of communication, and the level of communication determines the quality of technical cooperation.

Technical cooperation covers practically every field, including agriculture, industry, medicine, and education, etc. Although the object of transfer may be called technology, knowledge, know-how, skill, etc., the basic element of these objects is the aggregate of information. And “giving information” is the definition of “communication.”

## II. International communication for technology transfer

### *1. Definition of international communication*

At the end of the 1970s Luis Ramiro Beltran made an initial attempt at integrating most of the new concepts of international communication into a framework.<sup>1</sup> He took access as a precondition, dialogue as the axis of the process, and participation as the culminating result. This was his summary:

*Communication is the process of democratic social interaction, based upon an exchange of symbols, by which human beings share experiences under conditions of free and egalitarian access, dialogue, and participation. Everyone has the right to communicate in order to satisfy communication needs by enjoying communication resources. Human communication has multiple purposes, but exerting influence on the behavior of others is not the main one.*

Although the above-mentioned definition is only one among many made by researchers, we can use it as a guideline for our study. We can draw some important inferences from it as follows:

“Exchange of symbols” contains the use of foreign language.

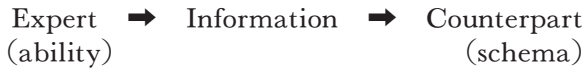
“Communication needs” relates to the existence of schema, which is the previously acquired knowledge structure accessed in the comprehensive process.

“Multiple process” relates to the various ways of technical cooperation.

### *2. Process of technology transfer*

From the two basic items of technical cooperation, we took up the expert dispatch program as the first step of our study.

The mechanism of technology transfer by an expert is illustrated as follows :



An expert tries to convey information to a counterpart. The result of such transfer depends on the ability of the expert and the schema of the counterpart. If the expert has enough knowledge and experience in a specific field, can speak the foreign language well, can adapt to the different culture, and has good teaching skill, we consider that he has high ability.

As for the counterpart, the degree of his schema may vary by the length of education, foreign language ability, etc.

In order to get better technical cooperation, we may try to improve the ability of the expert and the schema of the counterpart.

As a first step, we conducted an experiment to measure the schema degree, because we thought the condition of the counterpart was more vague and needed more clarification than the condition of the expert, who was mainly Japanese.

### III. An Experiment Conducted at the National University of Samoa

#### 1. *Purpose*

The purpose of this experiment was to examine the relationship between counterparts' degrees of schema about a technology and their comprehension when the transfer of technology is conducted for international cooperation.

However, in this experiment "transfer of technology" means "giving a lecture about international cooperation." Because "transfer of technology" implies "communicating an aggregate of knowledge" and "giving a lecture" is the same.

#### 2. *Hypothesis*

The hypothesis of this experiment was, "In the transfer of technology for international cooperation, a counterpart who has a higher degree of schema about the technology has a

higher degree of comprehension.”

Some terms utilized in the hypothesis are as follows:

- (1) “Technology” means “the contents of the special lecture about international cooperation given at the National University of Samoa.”
  - (2) “Counterparts” means “the students and staff at the university who attended the lecture.”
  - (3) “Schema” means “knowledge about Africa which counterparts already had before listening to the lecture.”
  - (4) “Comprehension” means “comprehension of the lecture.”
- Counterparts’ degrees of schema were measured with Questionnaire 1 (cf. Appendix 1), and their degrees of comprehension were measured were Questionnaire 2 (cf. Appendix 3).

### *3. Method*

#### (1) Subjects

Subjects consisted of the students and staff at the National University of Samoa who attended the special lecture and turned in both Questionnaire 1 and Questionnaire 2 (19 persons [13 males and 6 females]). Their ages were from 16 to 61 years. Although their native language is Samoan, English is used in most university classes and their ability is very high in English as well as their native language.

#### (2) Time: August 1998

#### (3) Materials

- \* Questionnaire 1 (cf. Appendix 1): It was utilized to measure counterparts’ degrees of schema and to extract subjects with high degrees of schema (group M) and subjects with low degrees of schema (group L). It comprised two main questions (the first question was for counterparts to self-diagnose their degrees of schema, and the second was for the experimenters to diagnose them); 50 was a perfect score.
- \* Special Lecture on International Cooperation [40 min.] (lecture [30 min.] and watching a video [10 min.]): The theme was “Development of Latin America and Africa—Observation Through Japanese Assistance (ODA).” The

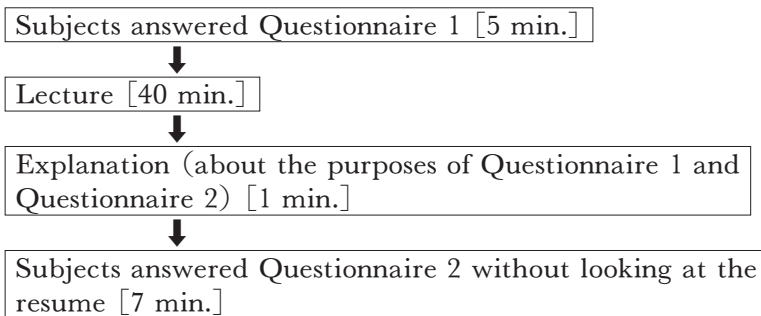
lecturer was one of the experimenters, Katsurai, and it was given in English.

\* Resume of the lecture (cf. Appendix 2)

\* Questionnaire 2 (cf. Appendix 3): It was utilized to measure counterparts' degrees of comprehension about the "Special Lecture on International Cooperation." It comprised 12 questions; 12 was a perfect score.

#### (4) Procedure

First, the university deputy president introduced the lecturer and gave a short explanation about the experiment, then the experiment was conducted as follows:



#### (5) Analysis Method: T-Test

### 4. Results

Five subjects with high degrees of schema (Group M) and five subjects with low degrees of schema (Group L) were extracted from the Questionnaire 1 score, and examiners analyzed the Questionnaire 2 scores of group M and group L. Table 1 shows the scores on Questionnaire 1 and Questionnaire 2 of group M and group L, Table 2 shows each group's mean and standard deviation on Questionnaire 2 scores, and Table 3 shows the mistakes on 12 questions in Questionnaire 2.

### 5. Discussion

First, the outcome of the T-test above did not prove the hypothesis, "In the transfer of technology for international



**Table 1: Scores on Questionnaire 1 and Questionnaire 2 of Group M and Group L**

	Subjects	Scores on Questionnaire 1	Scores on Questionnaire 2
Group M	Subject 1	50 (very much)	10.0
	Subject 2	47 (much)	6.0
	Subject 3	45 (some)	4.0
	Subject 4	41 (much)	5.0
	Subject 5	40 (some)	6.5
Group L	Subject 15	15 (a little)	2.5
	Subject 16	14 (some)	1.0
	Subject 17	11 (a little)	5.5
	Subject 18	8 (a little)	6.0
	Subject 19	2 (nothing)	7.5

The words in parentheses show counterparts' self-diagnosis about their degrees of schema (answers to #1 in Questionnaire 1).

**Table 2: Means and Standard Deviations of Group M and Group L on Questionnaire 2 Scores**

	Group M	Group L
Number	5	5
Mean	6.30	4.50
Standard Deviation	2.28	2.67

A T-test was conducted with the Questionnaire 2 scores; the results were as follows.

$$\begin{aligned} & \text{to } \approx 1.15, \quad df=8 \\ & \pm t_{\alpha/2, df} = \pm t_{0.05/2, 8} = \pm 2.306 \\ & -2.306 < \text{to} < +2.306 \end{aligned}$$

Therefore, the outcome was not significant at the 5% level.

**Table 3: Mistakes on 12 Questions in Questionnaire 2**

	Subjects	Questionnaire 2											
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Group M	Subject 1				√	√							
	Subject 2	√	√		△	√		△			√	√	
	Subject 3	√	√		√	√		√			√	√	√
	Subject 4	√		√		√	√	√		√		√	
	Subject 5	√	√		√	√	△					√	
Group L	Subject 15	√	√		△		√	√	√	√	√	√	√
	Subject 16	√	√	√	√	√	√	√	√	√	√	√	
	Subject 17	√			√	√		△	√	√	√		
	Subject 18	√		√	△	√		△	√	√			
	Subject 19	√			△	√		√		√			

“√” means a complete mistake but “△” does not; therefore, the score of “√” is 0 and the score of “△” is 0.50.

cooperation, a counterpart who has a higher degree of schema about the technology has a higher degree of comprehension.” However, as Table 2 shows, the difference between the means of group M (6.30) and group L (4.50) was 1.80, so experimenters considered this value was large enough to state that there was an acceptable tendency in the hypothesis. In any case, in this experiment the number of subjects in each group was too small, so another experiment with more subjects is necessary to obtain more accurate results.

Second, experimenters should mention that Q.1, Q.4, and Q.5 of Questionnaire 2 were difficult not only for group L subjects with low degrees of schema but also for group M subjects with high, as Table 3 shows. Why were they difficult?

Q.1 is, “So far, to what countries has Japan mainly given her cooperation?,” and the answer is “To Asian countries.” If subjects listen to the lecture faithfully, it should be easy enough for them to answer. Also, if Q.1 was too difficult to answer, Q.2 (“Recently, to what country was Japan asked by the international society to extend her cooperation?”) relevant to Q.1, should be as difficult as Q.1. But as Table 3 shows, half of the subjects could answer Q.2. A possible reason for this is that subjects might have lost their concentration and missed the answer, because there was trouble about a delay in handing out resumes at the beginning of the lecture, when the topic suitable for the answer to Q.1 was discussed.

Also, why were Q.4 (“What kind of cooperation does the Japanese government give to Africa?”) and Q.5 (“Why does the Japanese government give such cooperation to Africa?”) difficult? It is considered that if counterparts have prototypal schema, they tend not to accept new information easily, owing to adherence to their prototypal schema. Most subjects wrote “health” as the answer to Q.4, and “humanitarianism,” “duty of rich countries,” “need,” or “give and take” as the answer to Q.5. In a certain sense these answers are true, but they do not correspond with the contents of the lecture and are not exact answers to Q.4 (“some grant aid and technical assistance”) or Q.5 (“because in Africa GNP is rather low”). Therefore,

experimenters regarded them as prototypal answers. Moreover, as Table 1 shows, subject 19's score on Questionnaire 2, with the lowest degree of schema, was 7.50, and this was higher than any other subjects in group M and group L, except subject 1. Subject 19's self-diagnosis of schema about Africa was "nothing" (cf. Table 1). That is, it might be possible to state that in order to accept new information more easily, it is better for counterparts not to have prototypal schema.

Finally, for further study the following three points can be specified: ① Another experiment utilizing more subjects is indispensable for getting more accurate results. ② It is necessary to examine more specifically the difference between subjects' comprehension degrees with and without prototypal schema. ③ In this experiment, "the contents of the special lecture about international cooperation conducted at the National University of Samoa" was utilized as "technology." However, it is necessary to utilize actual skills (e.g. driving skills, maintenance skills, etc.) as "technology" and examine the relationship between counterparts' degrees of schema about the technology and their comprehension.

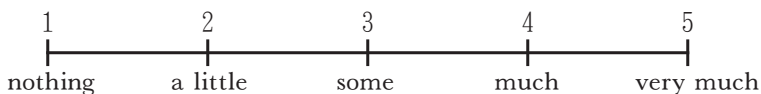
#### Note

1. Beltran, Luis Ramiro, *International Encyclopedia of Communications*, University of Pennsylvania, Vol. 2, 1981, p.16.

## Appendix 1: Questionnaire 1

ID No. \_\_\_\_, Age \_\_\_\_, Sex M ( ) or F ( )

1. How much do you know about Africa? Draw a circle around the number (1, 2, 3, 4, or 5)



2. What kind of things do you know about Africa?

(Answer only if you chose 2–5 above)

- 1) Which countries in Africa do you know? Write the names of as many countries as you can.

- 2) What does each word in group A represent? Choose the best word from group B and write the letter(a–g) in each parenthesis.

### Group A

- ① Kilimanjaro ( )
- ② Masai ( )
- ③ Nairobi ( )
- ④ Mandela ( )
- ⑤ Victoria ( )
- ⑥ Zambezi ( )
- ⑦ Sahara ( )

### Group B

- a) tribe
- b) desert
- c) river
- d) falls
- e) mountain
- f) city
- g) person

- 3) What is your image of Africa?

- 4) If you know more about Africa, write as much as you can.

## Appendix 2: Resume of the Lecture

Development of Latin America and Africa  
—Observation Through Japanese Assistance (ODA)—  
By Koichiro Katsurai (Keiai Univ., Japan)

## 1. Purpose

The purpose of this lecture is to give information about economic and social development in Africa and Latin America through the activity of the Japan International Cooperation Agency (JICA).

## 2. General situation

As for the linkage of cooperation between the donor and the recipient country, there seems to be some groups as follows :

- |                                |  |
|--------------------------------|--|
| a) From Japan                  | To Asian countries (China, Indonesia, etc.)        |
| b) From U.S.A.                 | To Latin American countries (Brazil, Mexico, etc.) |
| c) From European countries     | To African countries (Nigeria, Tanzania, etc.)     |
| d) From Australia, New Zealand | To Oceanian countries (Samoa, Fiji, etc.)          |

This means that Japanese cooperation has gone mainly to the Asian countries so far. But recently Japan was asked by the international society to extend her cooperation to Africa. Japan hosted an African development conference in 1993 and will host a second conference this year to strengthen international cooperation for the economic and social development of African countries.

Regarding Latin America, there are descendants of Japanese immigrants in some Latin American countries, namely Brazil, Mexico, Peru, Argentina, Bolivia, and Paraguay. Therefore, Japan has given some assistance through such Japanese populations.

A summary of the characteristics of Africa and Latin America is as follows:

	Africa	Latin America
Relations	Rather new, mostly business relations	Close because of Japanese immigrant descendants
GNP per capita	\$600; \$350; \$120	\$4,160; \$2,310; \$800
Independence	After World War II	19th century
Agriculture	Problem of drought	Problem of land reform
Japanese cooperation	Grant aid and technical assistance	Loans and technical assistance

## Appendix 3: Questionnaire 2

ID No. \_\_\_\_, Age \_\_\_\_, Sex M ( ) or F ( )

1. So far, to what countries has Japan mainly given her cooperation?
2. Recently, to what country was Japan asked by the international society to extend her cooperation?
3. Compared with Latin America, is GNP in Africa low or high?
4. What kind of cooperation does the Japanese government give to Africa?
5. Why does the Japanese government give such cooperation to Africa?
6. When did most African nations achieve independence?
7. After independence what was the main form of African government?
8. Before independence who ruled the biggest area in Africa?
9. After independence how did the new governments divide the land?
10. Is “land reform” a serious problem in Africa? Yes or No?
11. What kinds of problems does Africa have?
12. In the video, what have been the effects of Kenyan womens’ activities?