

Task Analysis of Interpersonal Communication Skills and Development of an Egogram-based Diagnostic System

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This study was undertaken to develop a diagnostic system for evaluating the communication skills indispensable in the training of specialists (nursing education) whose duties involve the provision of interpersonal support. Teaching resources were developed from a more practical and objective standpoint by process of instructional design to deal with time-consuming elements of curricula, ambiguous evaluation standards, and learning tasks that do not easily provide a sense of achievement upon completion. Egograms were adopted as the objective evaluation standard, and a diagnostic program for evaluating the student's communication tendencies was constructed. Operative assessment (of 5 cases presented for study by simulation on web) on nursing students revealed use of egogram patterns had enabled objective feedback to the students. Moreover, the learning paths traced by the students were greatly varied, demonstrating systematic ability to deal with student individuality. These findings indicated the efficacy of instructional design methodology in resolving the pragmatic issues in nursing, suggesting its wide applicability in various contexts.

Key words : Interpersonal communication skills, diagnosis, system development, egogram, instructional design

1. INTRODUCTION

In the training of any professional involved with interpersonal support, nurturing the power of communication is a vital task common to all regardless of the field in question. One such field, nursing education, is faced with the reality of being unable to appropriate extensive time to the teaching and learning of communication skills within the highly dense curriculum. Moreover, there is no standard against which one can teach (learn) that can ensure certain mastery of the powers of communication. Evaluation cannot escape the subjectivity of the evaluator, and acquiring a sense of achievement in this task is difficult.

Furthermore, professional communication requires constant modification depending upon the condition of the other party and the TPO, in addition to being conducive to carrying through with the expected role. For this reason, a supportive system enabling objective assessment of one's communication tendencies in various situations, recognition of strengths and weaknesses in light of the required qualities, and a

setup allowing for self-study in pursuit of such requirements was believed necessary.

Precedent studies offer several proposals regarding methods of training for nurturing communication. They include the use of simulated/standardized patients (SP) (Fujisaki 1998), computer-assisted instruction (CAI) (Muranaka 2001, Yurie *et al.* 2004), and development of scales for evaluating communication skills (Ueno 2004, Ueno 2005), among others. Each proposal contains effective aspects alongside problems needing to be resolved. In the case of SP, the limitation in human resources places strict restraints on the number of students that can benefit from direct interaction with such subjects. Extant CAI teaching resources have been evaluated highly in terms of supporting individual study elevating the motivation to study through a multimedia approach incorporating video and audio resources, with proven effectiveness in promoting learning in the cognitive and psychomotor contexts (Takeuchi *et al.* 1997; Morikawa *et al.* 2001). However, extant CAI teaching resources for communication are limited to learning in cognitive areas such as programs for

evaluating good and bad verbal responses to a presented situation, and even that has not progressed beyond the stage of experimental development (Yurie *et al.* 1995). Moreover, the perspective of sentiment, with great effect on the characteristics of an individual's style of communication has never been a point of focus in these endeavors.

Given this situation, an attempt was made to produce a more comprehensive, practical, and logical method of learning incorporating the steps of the instructional design (ID) process (Suzuki 2005) into learning resource development. The first step was the status analysis of students, teaching staff, and nurses (Muranaka 2005), for extracting characteristic communication patterns and coming up with a framework for construction of practical cases. The results were incorporated into this study, spanning content design, construction of a pilot evaluation system, distribution as a web-based learning resource, and operational assessment on its use by nursing students.

In order to fill in the shortages of the extant methods of teaching, enabling the presented cases to unfold in dynamic manner taking individual characteristics into account, this system provides three virtual scenarios reflecting the student's selected response, construction of selection options based upon the evaluation standards, and diagnosis of communication characteristics based upon the cumulative record of selective behavior. Case studies in the classroom to date have been in the form of an entire class discussing the correct action together or in small groups, followed by learning the correct response as presented. However, serial presentation of what would have ensued had the individual selected a different response reflecting the communication tendencies of each individual has not been possible. This study is a proposal of a method of teaching that was previously not possible, and positivistic evaluation of its effectiveness.

The egogram was adopted as the evaluation standard, and the possibility of providing objective feedback through use of egogram patterns was explored. Additionally, the learning paths tread by the students and the variety of study results were examined to assess whether this system was capable of dealing with the individuality of the students.

2. STUDY FRAMEWORK AND METHOD

As illustrated in the framework of this study (Fig. 1), the study was undertaken following the

steps below incorporating the ID process:

- 1) Problem definition: Clarification of the problems requiring resolution through needs assessment, student analysis, and task analysis.
- 2) Design of program content: Teaching objectives and evaluation standards were established based on the findings from the step 1 above. Order of study, teaching strategy, and appropriate teaching media were selected.
- 3) Development of a training course: Sections of training most suited to effective computer use were selected, for which teaching resources were designed. The developed program was subjected to experimental use, evaluation, and revision.

This time, we report on the process up to formative evaluation midway through the process of development within the framework of the overall research design.

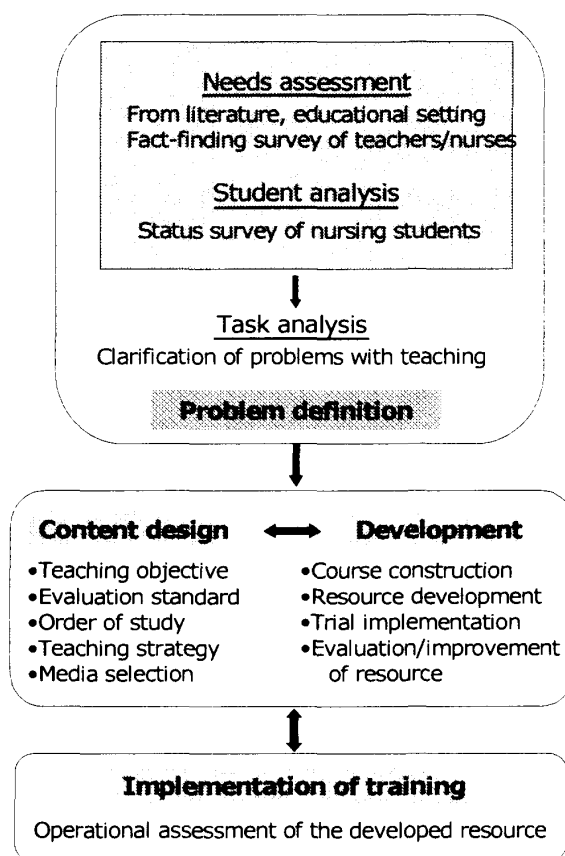


Fig. 1. Study framework

3. PROBLEM DEFINITION

3.1. Collection of data and methods of analysis

A questionnaire survey was conducted on 3rd and 4th year college nursing students from three

schools at the stage of studying communication. Ethical considerations were taken including informing the students that participation in the survey was entirely a matter of free will without undue consequences. Responses were obtained from 102 students between October and December, 2002. Survey content included items on perception of communication power, communication role models, and rating of study methods they had encountered. Questionnaire items were selected based upon preliminary interview results from 17 teachers in nursing and 32 head nurses. Responses in the form of free inscriptions were subjected to content analysis.

3.2. *Results from needs assessment*

Interview results revealed that teachers were capturing the needed study tasks in communication as follows through their interaction with students:

- 1) Experiencing direct interaction with people of varying age groups and status.
- 2) Accruing experience for fine-tuning sensitivity in emotional responsiveness to the other person's situation, and appreciating the disparity in values and ways of thinking.
- 3) Acquisition of experience in verbal exchange from the standpoint of fulfilling some role and responsibility.

On the other hand, the veteran nurse pointed out defects in the communication power of students (inability to develop conversation with respect to the reaction of the other person, deficient greetings, poor attitude, disrespectful speech.) Because of this, their wish was for the students to acquire the following prior to engaging in the practicums in nursing:

- 1) Knowledge of the effect reception manners, word use, and communication have on people, and the skills therein.
- 2) Listening powers, empathetic understanding, and receptive attitudes.

However, communication difficulties were often a source of concern even for teaching staff and the veteran nurses, and most were unable to express clear confidence in their own powers of communication. Moreover, most felt they were not providing timely guidance in communication to their students.

Such findings suggested that students needed both broad and in-depth experience for acquiring the communication skills required of the nursing professional, which was a study task that could not be accomplished within the limits of regular

classes in terms of both content and time.

3.3. *Results from student analysis*

A questionnaire survey revealed the following regarding student experience and their perception of communication skill requirements of the nurse:

- 1) Half the 3rd and 4th year college students had yet to meet persons who they regarded as role models for communication.
- 2) Students had experienced instances of their own communication tendencies acting to facilitate or inhibit communication with subjects. Fifty-seven (55.9%) of 102 students responded having experience of their own communication tendencies having brought about good results in care or nursing. The same tendencies were noted as experience of having precipitated unfavorable results by 35 (34.3%) of the students.
- 3) Students were aware of the need to elevate communication power including self-study outside the regular school curriculum. Inscriptions on actual steps being taken to promote communication skills as nursing professionals were obtained from 81 of 102 students. They included efforts such as accepting the other person and listening carefully to what they had to say, talking with various people from a variety of age groups, and increasing knowledge through dialogue, books, newspapers, TV, workshops, and other such media.
- 4) Experience or observation of failure was often noted as the trigger for styles of communication intentionally adopted by the students in interacting with patients.
- 5) There existed a small number of students with trauma associated with communication. Additionally, 33 of 102 students (32.4%) indicated having the experience of being cautioned or reprimanded regarding communication. Five such students indicated harboring adverse feelings toward the teacher who cautioned them. These findings indicated how communication training is affected by the people involved, together with the difficulty of rendering practical evaluations of ability.
- 6) Learning methods the students deemed effective are listed in Table 1. The association between the methods and inscriptions on why they believed the methods worked for them were examined. Many students gave the responses shown in Table 1. The advantages of the methods coincide with the characteristics

of the methods, from which it was inferred that limiting the methods of training would precipitate deviation in the results of training.

Table 1. Study methods considered productive

Method	N=102	Most frequently cited reason
Process records	65 (63.7%)	Enabled looking back on oneself with objectivity (55 subjects)
Case conferences	50 (49.0%)	Provided knowledge on differences in opinion and ways of dealing with things (32 subjects)
Lectures	35 (34.3%)	Provided basic knowledge (20 subjects)
Verbal guidance	31 (30.4%)	Personalized and timely guidance was useful (13 subjects)
Role play	29 (28.4%)	Became mindful to the flow and meaning of dialogue, and the other person's reactions (5 subjects)

*Reproduced in translation from Y.MURAKA *et al.* (2006), p.258

3.4. Results of task analysis

The following educational issues were extracted from the results of needs assessment and student analysis:

- 1) Need for learning resources providing a simulated role model given the low probability of all students being able to come across their ideal role models.
- 2) Need for a method of training that would enable the student to recognize how their own communication tendencies will be reflected upon the interpersonal relationship with the subjects of their nursing care.
- 3) Need for training with multifarious cases to allow for flexible application of communication skills tailored to the other person.
- 4) Wishes for study methods that would provide timely feedback regarding the quality of communication, and allow for objective self-reflection.
- 5) Need for a rational evaluation standard that can form the basis of common understanding between teacher and student regarding assessment of communication powers.

4. DESIGN OF PROGRAM CONTENT

4.1. Method of design

Teaching objectives and evaluation standards were explored given the problems defined. Content analysis was performed from the three perspectives of 1) clear focus, 2) objective of communication, and 3) principles of communication, drawn from literature regarding interpersonal communication skills in various areas

of study (education, psychology, social psychology, medicine, and nursing). Skills of importance for the nurse were extracted from the results. An evaluation standard was adopted, and study themes and course were designed to account for the extracted skills in association with the evaluation standard.

4.2. Design content

The association between the needs assessment, student analysis, and design of program content are summarized in Table 2. In order to address the educational issues thus clarified, the following was designed focusing upon the communication skills of the nurse extracted from a literature review:

1) Teaching objectives

- i) Capable of endowing the skills of listening with understanding, reciprocity, and empathy forming the foundation for interpersonal support.
- ii) Capable of endowing the skill of active questioning, and asking open-ended questions allowing the other person to come forth and fully express themselves.
- iii) Allow acquisition of ways of providing feedback with good/bad effects on human relations, together with how that happens.

2) Evaluation standard

The egogram was adopted as an index by which communication tendencies could be evaluated objectively. This was given the recognition that the egogram, based on transactional analytic theory, is a valid tool for capturing personality and behavior patterns, with widely recognized efficacy in constructing better interpersonal relationships. Ten-odd types of egograms have been developed in Japan. Among them, the Tokyo University Egogram was selected for its reliability and validity, construction upon proven scientific procedures, and wide use in medicine, education, and industry.

The egogram is a graphic representation of the five functional ego states below in association with each other, and the quantity of externally radiated mental energy.

- 1) Critical parent (CP) – the evaluating self.
- 2) Nurturing parent (NP) – the considerate self.
- 3) Adult (A) – the rational self.
- 4) Free child (FC) – the unadjusted self.
- 5) Adapted child (AC) – the adjusted self.

As these five functions can be used both positively and negatively (as assets or shortcomings), the focus is not on the good or bad, but on deficiencies and profusion, and is conducive to suggestions of how one should fortify one area

or attempt to control another.

Regarding the ego states that can influence the interpersonal support provided by a professional, the elements of NP, indicative of kindness and feelings of consideration, and A, representing the rational mind are considered indispensable, and these two functions being comparable or higher than the other three functions is considered ideal. In other words, the requirement is for controlled use of the NP and A depending upon the situation. In addition, excess in CP is said to precipitate conflict. Because excessive feelings of strictness readily invoke response patterns that impede communication (manipulative, domineering), the CP dominant type of person must attempt to keep their CP low, while elevating both NP and A.

From these considerations, it was decided to evaluate the appearance of NP and A, integral to interpersonal support, and CP, having negative

effects, from among the five functional states of the ego.

3) Order of study

The program was designed for use after acquisition of fundamental knowledge regarding communication, as the preparatory stage (preliminary study) to the practicums.

4) Teaching strategy

Provision of the program as a web-based resource allowing for training in communication skills through simulation, unlimited by restraints of time or place.

5) Media selection

Computer-based testing (CBT) was selected. The program was developed in Perl, using the Common Gateway Interface (CGI), designed to run on the server for students to access for study through web browsers.

Table 2-1. Association between results of needs assessment and design of training content

<Study tasks extracted from needs assessment>	<Reflection upon program design>
Experience of direct interaction with people from multifarious age groups and status.	Abundance of simulated cases
Experience for fine-tuning sensitivity to the other's situation.	Abundance of simulated cases
Experience of dialogue from a position of obligation and duty.	Teaching objective (ii)
Reception manner and word use.	Teaching objective (iii)
Effects of communication on the subjects of nursing.	Teaching objective (iii)
Skills of listening, empathic understanding, and recipient attitudes.	Teaching objective (i)

Table 2-2. Association between results of student analysis and design of training content

<Study tasks extracted from needs assessment>	<Reflection upon program design>
Absence of role models in the practicum setting.	Web-based resource unaffected by place, time, individual. Diagnosis of study outcome (detailed inscriptions.)
Experience of personal communication tendencies having influenced the outcome of medical care or nursing.	Diagnosis of study outcome (detailed inscriptions) to be conveyed as knowledge.
Recognition of need for diligent effort to enhance communication powers.	Teaching objectives (i, ii, iii)
Experienced or witnessed failure is manifested upon subsequent communication.	Effective & instantaneous feedback. Repeated study of simulated material.
Existence of students with experience of trauma associated with communication.	Web resource enabling continuation of individual study until satisfied.
Existence of students with adverse feelings toward instructors having cautioned them regarding communication.	Objective evaluation standards (egogram). Computer-aided teaching/study.
While various study methods were considered being helpful, the most frequently cited was process records enabling objective self-reflection.	Simulation. Reconstruction of study results. Effective & instantaneous feedback.

5. DEVELOPMENT OF THE TRAINING COURSE

5.1. System characteristics

The following three points can be cited as the characteristics of this training system:

1) Study records are kept for each student,

accessible only by the system administrator. Individual records include the student's name, number of responses per study case, the responses selected for each case, the final feedback, date and time of study. The system administrator is able to check up on all these

items via web browser.

- 2) Feedback messages are displayed instantaneously reflecting the selected response. Because training proceeds with a record of all selected responses, the system is capable of providing a diagnostic outcome, and immediate feedback based on the diagnosis.
- 3) The position of the response options on the screen has been designed to change at random, to prevent the student from responding from memory of the position of a correct response in repeated study of the same case.

5.2. Study course of the diagnostic program

The cases presented were constructed upon information extracted from the status and literature surveys, exemplary of subjects with whom communication is difficult. This time, five cases (a diabetic unresponsive to food therapy, a patient with acute myelocytic leukemia before disclosure, an informed terminal cancer patient, a patient refusing to be sponged down on successive days, and a geriatric patient with many complaints) were selected upon which a diagnostic program was created to evaluate the communication tendencies of each student. Students are free to start with any case, according to their interests (Fig. 2).

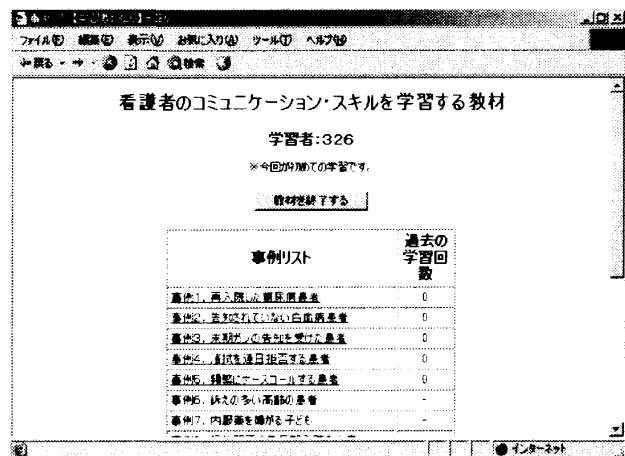


Fig. 2 Case selection page

Upon completing study with all five cases, a button for “complete the questionnaire” is designed to appear on screen. The questionnaire consisted of the following five questions, the responses to be provided as free inscriptions.

- 1) Please comment freely on any merits of this system.
- 2) Please comment freely on any aspects of this system requiring improvement.
- 3) Please comment on any difficulties you had understanding the wording employed in

presenting the cases.

- 4) Has the program provided any insights into your own style of communication?
- 5) Do you think undertaking this form of study is capable of endowing feelings of satisfaction or confidence?

5.3. Data structure of the diagnostic program

5.3.1. Scenario structure

The scenario for each case was structuralized as shown in Fig. 3. Communication starts with the words of the patient following presentation of the case summary. The student continues study by selecting how they would respond to the other's (patient's) words from among the three possible options. In the end, the process of the student's selection is subject to evaluation.

5.3.2. Outline of scenario construction

- i) Exchange steps 3 to 7 in Fig. 3 are constructed as A-dominant response patterns, leading to Feedback 8: Poor communication (A dominant type).
- ii) Exchange steps 9 to 13 are constructed as NP-dominant response patterns, leading to Feedback 14: Poor communication (NP dominant type).
- iii) Exchange steps 15 to 19 are constructed as CP-dominant response patterns, leading to Feedback 20: Poor communication (CP present).
- iv) The three response options are ranked good (○), neither good nor bad (△), or bad (×), according to projected patient response. The A-dominant and NP-dominant paths in Fig. 3 are the result of proceeding along ○ or △ projections, and the CP-dominant line shows the result of proceeding along a × projection.
- v) Responding after reaching Exchange step 7 or 13 triggers feedback of “Poor communication” as the result of overall evaluation of the following three styles of responding: 1) Selection of A-dominant responses characterized by inability to select appropriate NP-dominant (○) responses, 2) NP-dominant responses characterized by inability to select appropriate A-dominant responses, and 3) selection of CP responses.
- vi) Passing through Exchange steps 3 to 7 (A dominant type) and 9 to 13 (NP dominant type) and giving ○ responses to all situations are rewarded with Feedback number 21: Optimal communication.

Proceeding through the same scenes but giving ○ and △ responses is awarded with Feedback 22: Good communication.

vii) Each exchange is linked with 3 further exchanges (patient responses to the student's A-dominant, NP-dominant, and CP-dominant words.)

viii) The feedback messages provide commentary on the patient's last response, tendencies noted through the process of the student's selection of responses, grading of the quality of the process with reasons for the evaluation, together with notation of the study themes the student needs to address.

5.3.3. System response

The options presented at each selection scene, and the subsequent system response is described through a number of scenes corresponding to *Exchange 7* in Fig. 3. The ○, △, × notations are not displayed on the actual screen.

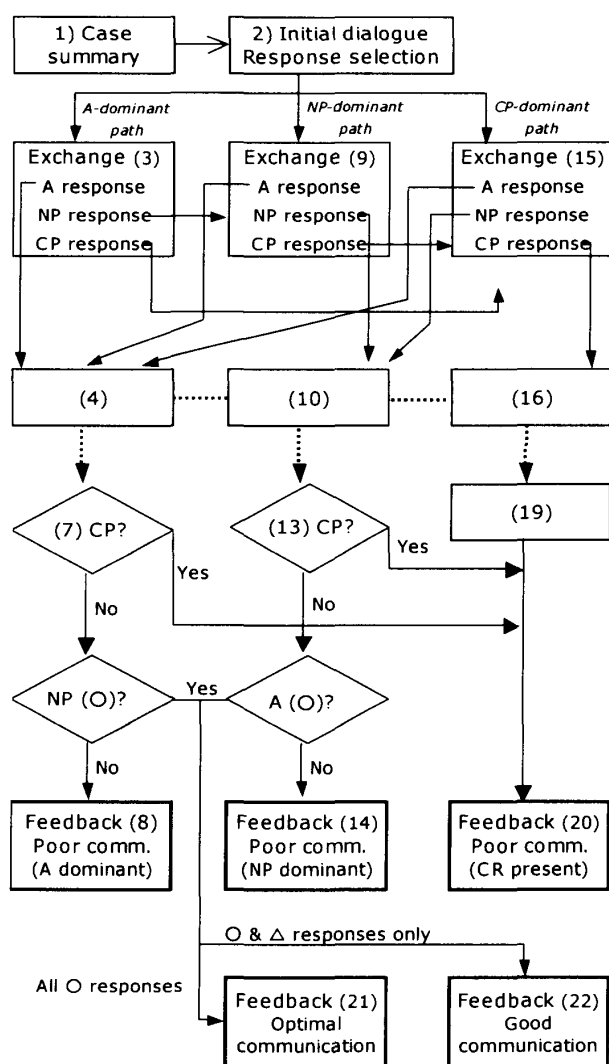


Fig. 3 Scenario structure

Response *a.* in this case is an A-dominant type response (△), constituting a productive form of feedback that is not threatening.

The *b.* response is an NP-dominant pattern (○), expressing the skills of being a good listener, reciprocity, and empathy.

Response *c.* is the CP-dominant pattern exemplifying non-recipient feedback.

Selection of response *a.* (△) in the instance below by a student not having selected any NP (○) or CP (×) responses up to that point are given a feedback message of Poor communication (A-dominant), corresponding to *Feedback 8* in Fig. 3.

Exchange scene sample

Mr. Sugita: "Isn't it the hospital's job to come up with the best treatment plan instead of blaming everything on the patient all the time?"

You:

(△) *a.* "Of course it is. Just that in the case of chronic illness, how one spends each day is very important, so I wanted to go over your understanding of this and how you are going through each day."

(○) *b.* "You're absolutely right, but the understanding by your colleagues at work is also quite important ... how are things in that regard?"

(×) *c.* "If you keep on taking such an oppositional attitude, there's no way we can work with you to provide good treatment and care."

Feedback message sample (following selection of response *a.* (△) above):

Mr. Sugita: "So, as I've been saying, it's difficult for me to eat regularly because of my job."

Do you understand why Mr. Sugita is upset?

Your responses up to this point have been highly objective.

This tendency is very effective in working out solutions to problems rationally. However, in dealing with persons requiring support, feelings of consideration from which to really listen to what is being said, being recipient to the meaning behind the words, and empathizing with the person are just as necessary.

Isn't it that Mr. Sugita, in response to the unrelenting logic of your response, was becoming increasingly irritated, feeling there was no way he could make you understand how you felt no matter what he said?

Selection of response b. (○) is designed to invoke the following dialogue:

Mr. Sugita: "Yes. You don't want to expose your weak side to others after all. I myself, don't want others to think there's going to be any handicap in my work because of illness ..."

You:

- (○) a. "The amount of stress you're creating for yourself thinking that way ... could you tell me more about that sort of stress?"
 (△) b. "Hmm. So you don't want to expose your illness as a weakness ..."
 (×) c. "Mr. Sugita, you won't be making much progress towards recovery unless you change your values."

Selection of response c. (×) invokes the following dialogue indicating that communication had been inhibited:

Mr. Sugita: "I'm perfectly aware of that without being told."

You:

- (△) a. "You must be going through a lot of emotions, but do you have anything you want to tell us?"
 (○) b. "You're right. You know all this. After all, you've been getting all sorts of guidance for 2 years."
 (×) c. "What a person knows doesn't always match his actions, which is where the problem lies."

Characteristic patterns of expression were categorized in terms of A, NP, and CP, and used

in creating the response dialogues. Similar to the CP-dominant responses below (Table 3), response patterns were categorized for A-dominant and NP-dominant type responses.

6. IMPLEMENTATION OF A PILOT PROGRAM AND EVALUATION AS A TEACHING RESOURCE

6.1. Implementation of the diagnostic program and method of evaluation

Second year students in two nursing colleges were asked for voluntary cooperation in the study at a time when they had completed study of the concept of communication. Fifty such volunteers were recruited during the period from December 2004 through March 2005. Students completed study of 5 cases by accessing the web resource individually. Learning effect was analyzed from study records and questionnaire responses compiled in the administrator mode. In addition, egogram patterns from the TEG were examined contrasting one's "usual self" to "if I were an ideal nurse". Validity of the feedback messages given as study outcome was evaluated. The value of the developed resource was examined through these evaluations.

6.2. Results of implementing the diagnostic program

The course of study followed by the students varied from case to case, with 17~37 patterns being seen (Table 4). This demonstrated that the response paths taken by the students were different even in arriving at the same diagnostic outcome.

Table 3. CP dominant response (critical self)

Communication tendency	Response pattern	Verbal expression
1) Assertive	Threatening, warning, cautioning	... will become ... if you don't do will ... if you don't ...
	Judgmental, critical, oppositional	People with your ... are ... What you're saying is absolutely ...
2) Imposing	Ordering, instructing, commanding	Do ... State things clearly.
	Preaching, edifying, binding	must do ... should do ... more
3) Interfering	Warning, solving, proposition	Shall we do ... Why don't you do ... I believe ...
	Probing, interrogating, questioning	What is it? What happened? ... and, what are you going to do about it?
4) Obsessive	Badmouthing, mocking, insulting	You're so ... for your ... You're a total ...
5) Peremptory	Lecturing, instructing, factual	... is simply like that. ... is the way things are.

Table 4. Study paths traced by students and diagnostic outcome (N=217)

Case	Result	Study paths	N	Diagnostic outcome
Case 1 N=48	37	23	34	Good
		12	12	Poor (CP present)
		2	2	Poor (NP dominant)
Case 2 N=45	21	12	24	Good
		6	10	Poor (CP present)
		3	11	Poor (NP dominant)
Case 3 N=42	25	15	27	Good
		6	7	Poor (CP present)
		1	5	Poor (NP dominant)
Case 4 N=40	29	3	3	Poor (A dominant)
		22	33	Good
		7	7	Poor (CP present)
Case 5 N=42	17	15	40	Good
		2	2	Poor (CP present)

Regarding egogram patterns the students felt were being expressed during time spent working with the teaching resource, 24 (48%) answered

both the usual self and ideal nurse, 16 (32%) believed it was the ideal nurse, and 10 (20%) felt it was their usual self. In reality, markedly higher agreement was seen between the ideal nurse egogram and study outcome in comparison to agreement between the usual self egogram and study outcome (Table 5).

Table 5 Study outcome and TEG pattern*
(Total number of cases) N=217

Study outcome	Usual self		Ideal nurse	
Optimum	9 (0)	0.00%	9 (9)	100.00%
Good	149(29)	19.46%	149(140)	93.96%
Poor (A dominant)	3 (0)	0.00%	3 (3)	100.00%
Poor (NP dominant)	18 (6)	33.33%	18 (18)	100.00%
Poor (CP present)	38 (14)	36.84%	38 (29)	76.32%

Numbers in parentheses = agreement between egogram and outcome

% = agreement rate

*Reproduced (in translation) from: Y. MURANAKA *et al.* (2006), p.259.

Next, the students' egogram patterns were split into the four categories of: A-dominant, NP-dominant, CP-dominant, and Good (comparatively high A and NP) in order to examine agreement between the diagnostic reoutcomes and egogram patterns. (Table 6).

Of the total of 19 TEG patterns, 18 types were found regarding the usual self, while 5 types were found regarding the ideal nurse. The association with these variations and study outcome was examined (Tables 7, 8). Types not falling into the 4 basic categories were classified under Other. The Other category included cases involving deficiency in a certain ego function, or when characteristic patterns were noted in the FC (Free child) or AC (Adapted child) functions. Subjects falling under the

Other category amounted to 113 of the 217 subjects regarding the usual self, and 14 regarding the ideal nurse. This revealed that there was a very close match between the egogram of the ideal nurse and diagnostic outcome.

Moreover, the questionnaire allowed for examination of the system merits and points calling for improvement, aspects brought to self-awareness, feelings of accomplishment and confidence. Merits of the system (n=44) included effective feedback messages, realistic content, cases invoking the wish to learn, and study method allowing one to proceed at their own pace. Points calling for improvement (n=27) were wishes for cases with 4 or 5 responses to choose from, or possible supplementation by audio information, which were not of critical nature, but simply requests for further development. Aspects brought to self-awareness (n=37) included inability to do anything beyond becoming attuned to and receptive to the patient, just empathizing with the patient, tendencies of making unilateral decisions or acting obtrusively, need for logical measures, strengths and weaknesses depending on the other person, communication being subject to one's state of mind, and overemphasis on listening. Regarding feelings of accomplishment and confidence (n=39), while all students felt the program to be both informative and conducive to confidence, 11 (28%) of them also noted being unable to say that the program had unequivocal value in building up confidence. These questionnaire results were taken as indication of a high level of acceptance of the diagnostic outcome (feedback messages) by the students.

Table 6. Classification of TEG patterns

TEG pattern type	Ego function manifestations	Communication tendency			
		Dominant state			Good
		A	NP	CP	
A dominant	A dominant	○			
Low AC	Dominance of multiple non-AC functions	○	○	○	○
Reverse N I	A/CP dominance	○		○	
Trapezoid I	A/NP/FC dominance	○	○		○
Trapezoid II	A/NP dominance	○	○		○
NP dominant	NP dominance		○		
U III	NP/CP/AC dominance Comparably low A and FC		○	○	
N II	NP/AC dominance		○		
M	NP/FC dominance		○		
P dominant	NP/CP dominance A is not low		○	○	○
CP dominant	CP dominance			○	
Reverse N III	CP/FC dominance			○	

Table 7. Association between diagnostic result and TEG pattern of the usual self
(total number of cases) N=217

TEG category Diagnostic outcome	A dominant	NP dominant	CP dominant	Good	Other	Total	Agreement rate (excl. other)
Poor (A dominant)	0	0	0	0	3	3	—
Poor (NP dominant)	0	6	1	0	11	18	6/7 85.71%
Poor (CP present)	0	0	14	0	24	38	14/14 100.00%
Good (incl. optimal)	5	24	24	30	75	158	30/83 36.14%
Total	5	30	39	30	113	217	

Table 8. Association between diagnostic result and TEG pattern of the ideal nurse
(total number of cases) N=217

TEG category Diagnostic outcome	A dominant	NP dominant	CP dominant	Good	Other	Total	Agreement rate (excl. other)
Poor (A dominant)	3	0	0	0	0	3	3/3 100.00%
Poor (NP dominant)	0	18	0	0	0	18	18/18 100.00%
Poor (CP present)	0	0	29	0	9	38	29/29 100.00%
Good (incl. optimal)	0	5	0	148	5	158	148/153 96.73%
Total	3	23	29	148	14	217	

7. DISCUSSION

7.1. *Validity of using the egogram as an evaluation index*

Study outcome according to the diagnostic program tended to match the egogram of the student's concept of the ideal nurse. Therefore, the diagnostic method for communication tendencies constructed around the axis of the ego functions represented by the egogram was found to have validity in association with the image of the idealized nurse. However, measures accounting for response patterns outside the A-, NP-, and CP-dominant types dealt with in this diagnostic program falling under the Other category remain unaddressed. It is believed this should be possible by including scenarios representing deficiencies in the five ego functions, and the AC- and FC-dominant types, in addition to the three-option selection provided in this trial, in the cases to be added in future.

7.2. *Value as a system of support for individual study*

The highly variable study path taken by students, and the multifarious diagnostic results suggest the capability of this teaching resource in dealing with student individuality. In addition,

some students were seen challenging the same case repeatedly following insufficient results, which suggests that the feedback messages might be playing a role in promoting the will to study. The positioning of response options which is designed to change randomly—one of the characteristics of this program—and the provision of specific feedback accounting for the serial communication process are believed to be of relevance in this respect. It has been said that in teaching resources constructed of single scenes per case requiring the student to give the correct verbal response, the student is prone to concentrating on the percentage of correct answers, distracting concentration on content (Yurie *et al.* 2004).

Moreover, the students judged the system as being a study method portraying credible, realistic situations, which stimulated their will to study. Construction of the cases was undertaken utilizing reports by teaching staff, students, and clinical nurses on cases in which communication was difficult, patient diaries published as books or found on the Web, with focus on making the cases as real as possible. We believe it was this consideration that played effectively in the program for experiencing the process of dialogue, with positive effect on the student's desire to learn.

However, many more cases are requisite for this learning resource to fully fulfill the objectives outlined in section 4.2.1. and become fully functional as a support system for individual study. In addition, supplementation by a retainer program is believed indispensable to fortify learning through reflection over study content as reconstructed in the diagnostic outcome, for the results of study to become fixated as knowledge.

7.3. The significance of this teaching resource within the nursing education curriculum

Learning through case studies is applied in pursuit of various objectives in nursing education. Presentation of most such cases is as text material, with the occasional VTR, simulated patient, or mock up. However, the need for adjustment to account for timing of presenting cases and content, problems pertaining to realistic presentation of the cases, need for individualized exchange with each student, and lack of time have been noted as issues needing to be addressed (Egawa *et al.* 2003). In reality, teaching using process records of dialogue with patients which the students find effective requires considerable time in one-on-one teaching.

Moreover, although communication has conventionally been regarded as the foundation to nursing practice, neither time nor strategy has been provided for teaching this taking individual characteristics into account. We believe our teaching resource has the practical power to clear such problems, diagnosing the communication tendencies of students in practical situations, and providing effective training in communication skill.

Upon completion of this system consisting of a diagnostic program and a retainer program, the time restrictions governing regular curricula will no longer present an obstacle. As shown in Fig. 4, appropriate cases from this training program can be selected for individual study depending upon

the area and speed of learning, following acquisition of basic knowledge through classroom learning in areas such as "Communication theory" and "Theory of interpersonal relations". It is believed the system should allow students to acquire a state of readiness for practical communication, bringing together theory and practice through the realistic simulation provided by this training resource.

8. SUMMARY

The objective of this study was the development of teaching resources for the acquisition of communication skills within the framework of higher education for the training of professionals in interpersonal support. Sights were set on construction of a practical system allowing for highly objective evaluation, capable of providing support for individual training. Findings from the various stages of the study can be summarized as follows:

- 1) Simulation-based teaching resources employing egogram patterns provides a framework enabling easy addition of cases by the teaching staff.
- 2) Use of egogram patterns allows for diagnosis of communication styles and provision of objective advice to the student.
- 3) Addition of cases depicting difficulties relative to communication in the educational and clinical setting to this teaching resource will allow for acquisition of multifarious experience in short periods of time through simulation.
- 4) Working upon the diagnostic program as the basis, addition of a retainer program for reconstructing and reflecting over the course of study will allow for development of the system into a program comparable to the effective but time-consuming method of teaching using process records.
- 5) The results of this study point to the wide adaptability of ID methodology as an effective means for improving the pragmatic issues inherent to nursing.

Our next theme is the implementation of a training course employing the developed resource, for operational assessment of the program designed and developed from the long-term perspective.

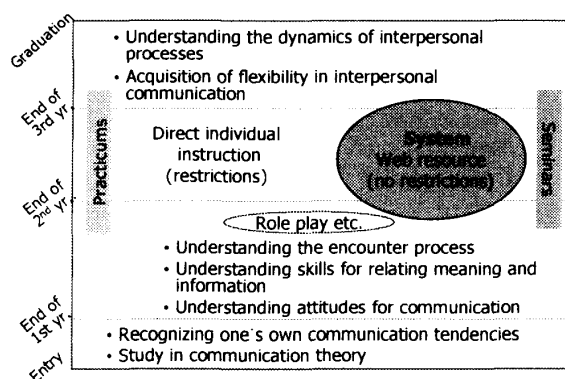


Fig. 4. Position of system within the nursing curriculum

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