

A Freshman Orientation Program to Provide an Overview of the Medical Learning Roadmap

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Abstract

International accreditation of medical education was introduced in Japan in 2013 and is planning to be applied in late 2014 or 2015. Students will need to cope with the resulting changes and to recognize by what route they will learn medicine. Therefore, a freshman orientation course, which was based on problem-based learning (PBL) and had been held for first-year students, was modified as an awareness reform program in which students would learn “how to learn medicine.” We investigated whether this program has led to useful changes in students’ recognition of the way of learning in medical school and their directions as learners. The program was held for 114 first-year medical school students in 2013 and consisted of PBL tutorials, large-classroom lectures, simulation learning using role-play with simulated patients, and team-based learning (TBL), presented in this order. Learning modules that is made with an integration of the clinical sciences with the basic biomedical and the behavioral and social sciences were provided. A nonanonymous questionnaire survey asking “what learning methods are effective for you?” was conducted before and after completion of the course. Furthermore, group answers obtained in TBL were investigated. The score for the question “To what extent can you imagine your route of learning during your 6 years?” significantly increased from 3.1 ± 0.99 (mean \pm SD) before the course to 3.5 ± 0.88 ($p < 0.01$) after the course. The score for the question “To what extent is the small-group learning, such as PBL, useful for you?” significantly increased from 3.9 ± 0.73 to 4.2 ± 0.71 ($p < 0.05$). Group responses in TBL sessions indicated that students desired classes that presented tasks and regarded “emphasis on reflection” and “observation of senior physicians as role models” as the most important methods for learning interview skills. We believe students should acquire active learning attitudes as adults early in their 6 years of medical school. The level of understanding of “how to learn as adults” was 3.7 and indicated a moderate result. This course employed many educational strategies, and we believe it helped students understand what they learn and how to learn during their 6 years of medical and to get an overview of the learning roadmap.

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Key words: problem-based learning, team based learning, adult learning theory, self-directed learning, cooperative learning

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Introduction

International accreditation of medical education was introduced in Japan in 2013 and is planning to be applied in late 2014 or 2015 using the World Federation for Medical Education Global Standards as the evaluation criteria¹. In particular, bedside learning must be enriched, and an integrated curriculum should be developed. Teachers will evaluate university educational programs and modify them according to the standards. Students will also need to cope with such changes and to recognize by what route they will learn medicine.

Nippon Medical School believes that students must recognize the significance of this movement early in their education. Therefore, a course entitled "Introduction to Medicine," which was based on problem-based learning (PBL) and had been held for first-year students, was modified as an awareness reform program in which students would learn "how to learn medicine." We investigated whether this program has led to useful changes in students' recognition of the way of learning in medical school and their directions as learners.

Method

The program was held for 114 first-year medical school students in 2013 and consisted of PBL tutorials, large-classroom lectures, simulation learning using role-play between students and

simulated patients (SPs), and team-based learning (TBL)², presented in this order. Learning modules that is made with an integration of the clinical sciences with the basic biomedical and the behavioral and social sciences were provided^{1,3,4}. After orientation, the students were given clinical case tasks that were difficult for first-year students (thyroid disease) and were based on the PBL tutorials. Next, a physiologist gave lectures on the basic concepts of endocrine control. After that, an endocrine surgeon gave lectures on the treatment of thyroid disease. Next, students learned basic medical interview skills through role-play with SPs⁵. The SPs' cases were related to the preceding PBL tasks. Finally, the course was summarized through TBL, in which students obtained metacognitive understanding of learning methods⁶. The program consisted of 11 sessions of 90 minutes (**Table 1**).

A nonanonymous questionnaire survey asking "what learning methods are effective for you?" was conducted before and after completion of the course (**Table 2**). A 5-point Likert scale (1="very poor" to 5="very good") was used. In addition, students were asked to give their opinions by submitting reports. Furthermore, group answers obtained in TBL were investigated.

Because the results of this study are part of routine survey for program evaluation, we believed that formal research ethics approval was not needed⁷. However, all participants provided written informed consent for their participation in the study.

Table 1 Structure of a freshman orientation program to provide an overview of the medical learning roadmap

Session	Duration (minutes)	Method	Contents
1	90	Lecture	Orientation
2	90	PBL	PBL tutorial, Self-directed learning
3	90	PBL	PBL tutorial, Self-directed learning
4	90	PBL	PBL tutorial, Self-directed learning
5, 6	180	PBL	PBL tutorial, Self-directed learning
7	90	Lecture	Large class lecture, basic science
8	90	Lecture	Large class lecture, clinical science
9	90	Role-play	Medical interview, skills training
10	90	Role-play	Medical interview, skills training (with SPs)
11	90	TBL	Summary of program

Table 2 Questionnaire for students

Q1	"To what extent can you imagine your route of learning during your 6 years?"
Q2	"To what extent are the following learning methods useful for you?"
Q2-1	Self-learning with textbooks, <i>etc.</i> :
Q2-2	Learning using DVDs, the Internet, <i>etc.</i>
Q2-3	Large-classroom lectures
Q2-4	Small-group learning, such as PBL
Q2-5	Small-group practical training
Q2-6	Practical training in clinical settings
Q3	"To what extent can you understand how to learn as adults?"

Table 3 Results of questionnaire survey

Question	Before or after course	1: very poor (%)	2: poor (%)	3: fair (%)	4: good (%)	5: very good (%)	Mean score \pm SD	P
Q1: "To what extent can you imagine your route of learning during your 6 years?"	Before	1.1	37.3	22	34.1	5.5	3.1 \pm 0.99	<0.01
	After	1.1	19.8	13.2	63.7	2.2	3.5 \pm 0.88	
Q2: "To what extent are the following learning methods useful for you?"								
Q2-1: Self-learning with textbooks, <i>etc.</i>	Before	0	14.2	15.4	47.3	23.1	3.8 \pm 7.1	<0.05
	After	2.2	8.8	9.9	51.7	27.4	3.9 \pm 0.95	
Q2-2: DVDs, the Internet, <i>etc.</i>	Before	1.1	18.7	26.4	46.2	7.6	3.4 \pm 0.92	
	After	2.2	21	18.7	50.5	7.6	3.4 \pm 0.98	
Q2-3: Lectures	Before	1.1	4.4	23.1	51.6	19.8	3.8 \pm 0.82	
	After	1.1	7.6	19.3	52.8	18.7	3.8 \pm 0.87	
Q2-4: Small-group learning, such as PBL	Before	0	4.4	17.6	59.3	18.7	3.9 \pm 0.73	
	After	1.1	2.2	5.5	62.6	28.6	4.2 \pm 0.71	
Q2-5: Small-group practical training	Before	1.1	1.1	16.5	51.6	29.7	4.1 \pm 0.78	
	After	0	2.2	11	49.5	37.3	4.2 \pm 0.53	
Q2-6: Practical training in clinical settings	Before	0	0	3.3	19.8	76.9	4.7 \pm 0.51	
	After	0	0	4.4	31.9	63.7	4.6 \pm 0.58	
Q3: To what extent can you understand how to learn as adults?	After	1.1	3.3	30.8	57.1	7.7	3.7 \pm 0.72	

Results

1. Questionnaire Survey

Ninety-one students gave consent to participate in the study, and their questionnaire responses were investigated (**Table 3**).

The score for Q1 ("To what extent can you imagine your route of learning during your 6 years?") significantly increased from 3.1 \pm 0.99 (mean \pm SD) before the course to 3.5 \pm 0.88 (p <0.01) after the course. Representative comments included:

"I summarized what I want to do, *etc.*, based on what I learned, and this made me aware once again of how this experience was important" and "It is

difficult to understand the relationship between the current university curriculum and the reason why I learn this subject at present."

Scores for Q2-1 to Q2-6 ("To what extent are the following learning methods useful for you?") changed as follows. The scores for small-group learning, such as PBL (Q2-4), increased significantly from 3.9 \pm 0.73 to 4.2 \pm 0.71 (p <0.05), and those for practical training in clinical settings (Q2-6) decrease significantly from 4.7 \pm 0.51 to 4.6 \pm 0.58 (p <0.05). Comments included:

I felt that I might not be ready for the course and that the course was highly specialized, and that was why I could participate in and try to understand the classes. I also could attend the lectures with high motivation.

Table 4 Tasks and results of group discussions in TBL

Task 1: A situation concerning a typical large-classroom lecture and students' responses to it was presented, and the students were asked to consider methods to improve such a class.

1	"Task presentation type" classes are desirable	9 groups
2	Incorporation of discussion among students, such as buzz sessions, into lectures	3 groups
3	Clarification of learning objectives in syllabuses	1 group
4	Enrichment of materials for preparation	1 group
5	Enrichment of handouts	1 group

Task 2: An example of a student who was nervous but achieved moderate results on an objective structure clinical examination (OSCE) was presented, and students were asked what method for learning medical interview skills they would regard as most important in the future.

1	Medical students should simply practice tasks until nervousness is gone	5 groups
2	Emphasis on reflection	4 groups
3	Observation of senior doctors as role models	4 groups
4	Discipline in daily life	2 groups
5	They would prepare for any OSCE as an examination	0 group

Also, in the future, I would like to learn in a self-directed manner with tasks like this. The small-group learning in which we listen to and are inspired by the opinions of friends is more significant than I imagined.

I felt that I should not simply understand medical knowledge only for tests but should steadily learn it while keeping in mind the presence of patients whom I will see in the future by utilizing the experience of medical interviews with SPs.

The level of understanding of how to learn as adults (Q3) was surveyed only after the course, and its score was 3.7 ± 0.72 . Comments included:

I think that it is very beneficial to students that the university shows them guidelines on whose basis they can learn voluntarily.

The idea of adult learning doesn't have to be shared by everyone. Universities are institutions that should respect students' independence more.

2. Results of Group Discussions in TBL

Regarding factors that make large-classroom lectures more "active," 9 of the 15 groups answered that "task presentation type" classes are desirable, and, subsequently, 3 groups proposed the incorporation of discussion among students, such as buzz sessions, into lectures. Moreover, students were asked what method for learning medical interview skills they would regard as most

important in the future. "Emphasis on reflection" and "observation of senior physicians as role models" were each selected by 4 groups (Table 4).

Discussion

The amount of medical knowledge and skills that medical students must assimilate is rapidly and continuously increasing, and they are required to learn the minimum necessary as their basic knowledge⁸. Accordingly, medical students are expected to acquire and use ever more knowledge and skills, to confront problems that lie ahead and to solve them. Medical students must also be active learners based on the adult learning theory proposed by Knowles⁹. We believe students should acquire active learning attitudes as adults early in their 6 years of medical school. The level of understanding of "how to learn as adults" was 3.7 and indicated a moderate result. Also, many students commented that they would somehow like to make active learning a priority. On the other hand, our finding that some students did not fully understand adult learning theory and felt discomfort with being forced to learn with this concept suggests a limitation of first-year students.

In PBL, clinical tasks that were difficult for first-year students were presented in an attempt to increase their motivation to learn. This attempt was

based on Vygotsky's "zone of proximal development."¹⁰ Through the PBL sessions, many students recognized the significance of the core elements of the session, self-directed learning and cooperative learning¹¹⁻¹⁴, and the usefulness of small-group learning, such as PBL, was rated higher after the course. However, that more time in this course was spent on PBL than on any other activity may have strengthened such an impression.

Classroom lectures can efficiently transmit information that learners should obtain. However, information tends to be transmitted in only one direction¹⁵. Once students experience a process in which they first learn by themselves and then learn what they could not fully understand from lectures by specialists, such as in the present program, their impression of classroom lectures will change. Students' comments suggested their perception of lectures had changed: "The content was difficult for first-year students to understand, but I was able to attend the lectures with interest because of prior self-learning" and "I think that it is necessary for us to actively prepare for and review lectures." In the TBL sessions, many groups answered that "task presentation type" classes and incorporation into lectures of discussion among students could make lectures more active. We believe that the students' requests are consistent with the lecture techniques recommended to teachers¹⁵.

The rating for bedside learning decreased slightly but significantly from 4.7 before the course to 4.6 after the course. Although students always recognize that bedside learning is the most important learning program in medical school, we speculate that the rating decreased because students recognized the importance of linking bedside learning to other learning programs, instead of blindly believing in its importance.

Through small-group training with SPs, students fully recognized the importance and difficulty of communication. As group responses in the TBL sessions, both "emphasis on reflection" and "observation of senior physicians as role models" were each selected by 4 groups. We believe that students understand, to some extent, the concept of the reflective practitioner¹⁶.

The scores for the usefulness of personal learning with textbooks and notebooks before and after the course were 3.8 and 3.9, respectively, but we think that there were positive changes. Many students gave the following and similar comments, suggesting that they understood the necessity of personal learning linked to PBL and lectures: "In PBL, I listened to my friends talk about what they had learned and fully realized my lack of study," and "I thought that I would like to prepare for and review classes by self-learning and receive timely evaluations."

In conclusion, this course employed many educational strategies, and we believe it was useful for helping students to understand what they learn and how to learn during their 6 years of medical school and to get an overview of the learning roadmap.

A limitation of this study was the small sample of first-year students, which does not allow us to generalize the conclusions to all students. A second limitation is that first-year students may have given consent to participation in the study without fully understanding the university's educational guidance because of the characteristics of this learning stage. We think that the efficacy of this course will be clarified by having students evaluate it again at graduation.

Conflict of Interest: The authors have no conflicts of interest to declare.

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