

Compilation of the Reply to the IChO Survey

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Introduction

At the end of March 2000, we sent a mail containing a questionnaire entitled "IChO Survey" [1] to mentors of the countries participating in the 31st International Chemistry Olympiad. Their addresses are taken from the home page for the 31IChO [2]. In spite of the sudden request, the mentors of as many as twenty-four countries sent back a reply by the end of May. The countries include Belgium, Bulgaria, Byelorussia, Canada, Czech, Denmark, Finland, Ireland, Kazakhstan, Latvia, Netherlands, New Zealand, Portugal, Russia, Slovenia, Sweden, Switzerland, Taiwan, etc. The subcommittee expresses hearty gratitude to every mentor of each country who politely collaborated this survey.

Here, the summation of the answer to each question was shown and general trends observed in the results are presented. The figures shown represent the number of countries which marked the check box for each category in the questionnaire, unless otherwise noted.

The Distribution of Replied Countries and the Method for Selecting Student Delegate

The first inquiry was the history of participation in the IChO, followed by the method of selecting students for the delegate.

Q1 In what year did your country begin participating in the IChO?

'60s: 4 '70s: 3 '80s: 7 '90s: 10

The number distribution of replying countries agrees approximately with that of countries participating in IChO for '70s, '80s, and '90s. There seems to be no significant bias in the distribution of the decade of first participation for the replying countries from that for all participating countries [3].

Q2 How were the student delegates to the IChO selected in the latest IChO your country participated in? Were the National exams conducted to select the team?

Yes: 24 No: 0

All countries are holding domestic Chemistry Olympiad or the corresponding selection, where the delegates have been chosen.

The outline of the selection method (the domestic Chemistry Olympiads)

Q3.1 How many steps of exams or other screening processes were taken to select the student delegates to the IChO? (If the student delegates were selected from the finalists through special training processes such as a study camp, these processes are not to be

included here.) How many local sections was the nation divided into in the screening processes? (before final selection)

(1 step: 5)* 2 steps: 13(4)* 3 steps: 8(3)* 4 steps: 4(2)*

* Figures in parentheses indicate the numbers of countries affording the final selection during the training period.

The second question proves to have been ambiguous, so the replies are not included.

Q3.2 What types of publicity campaigns were carried on to recruit student participants in the selection?

(1) Through school teachers	13
(2) Through education system out of school	2
(3) Newspapers and TV	0
(4) Other	1 (Posters)
(1) and (2)	4
(1) (2) and (3)	1
(1) and (4)	2 (Web site)
(1) (2) (3) and (4)	1 (Web site)

Q3.3 What was the approximate number of the students who participated in each step? In what grade were the students?

Only first step is shown.

1 st step	Total	Twelfth	Eleventh	Tenth and under
0	0	2	2	9
~100	1	0	5	3
100~500	10	7	6	2
500~1,000	4	4	2	0
1,000~5,000	6	3	1	2
5,000~10,000	2	1	0	0
10,000~	1	0	1	1
No Answer	0	7	7	7

In most countries, majority of the participants is the twelfth graders. In four countries the number of the under-eleventh graders participating are similar to that of the twelfth graders, while only the under-eleventh graders are participating in the selection in two countries.

In connection with Q3.1, All the countries taking only one step in the selection have the total participants of 300 or less. On the other hand, all the countries with the participants of over 1000, with only one exception, carry out the selection in three steps or more.

Q3.4 What types of exams did the students take? Please give the approximate time for each.

Average	Written exam	Experimental exam
1 st step	2.8 hours/23	4 hours/1
2 nd step	3.5 hours/23	3.5 hours/15
3 rd step	4.4 hours/12	3.6 hours/11

4th step 6.0 hours/5 4.0 hours/4

One country imposes the experimental exam from the first step. On the other hand, three countries impose no experimental exam throughout the overall two or more steps of selection.

Q3.5 Level of the problems in each selection step? (please check one or two only)

Two steps (twelve countries)

	High school (Basic)	High school (Advanced)	Intermediate	IChO
1 st step	5	4	2	1
2 nd step	0	3	5	4

Three steps (seven countries)

	High school (Basic)	High school (Advanced)	Intermediate	IChO
1 st step	1	5	1	0
2 nd step	0	2	5	0
3 rd step	0	0	4	3

Four steps (five countries)

	High school (Basic)	High school (Advanced)	Intermediate	IChO
1 st step	3	2	0	0
2 nd step	0	5	0	0
3 rd step	0	2	3	0
4 th step	0	0	3	2

In the first step, most country imposes the problems of high school level. In the last step, irrespective of total steps, the number of countries imposing intermediate level problems and the number of those imposing IChO level ones are similar to each other. Only one country imposes IChO level problems prior to the last step.

Training of the Student Delegates to the IChO including Finalists

Queries were made on how and what kind of special training was carried out for IChO to the student delegates (or candidates).

Q5.1 How were the student delegates trained?

Study camp: 23 Weekend Lessons: 1

In some countries, study camp was combined with another way of training as follows:

Study camp and correspondence course: 3
 Study camp and self-learning: 1
 Study camp and lessons during the year: 1

In the country with no study camp, seven Saturdays from March over April have been allocated for the training. Some country holds fifteen lecture and experimental classes in a year in addition to the study camp.

What follows are the answer to the further questions on study camps.

Days: 1~4: 6 5~9: 6 10~19: 9 20~: 2
Month: Mar-Apr: 1 April: 5 Apr-May: 1 May: 5 May-Jun: 1 June: 9
Place: University: 20 High school: 2 No answer: 1

Q5.2 How many students were trained?

4: 7 5: 3 6-10: 4 11~19: 5 20~: 5

Training only four to five students indicates that the delegates are determined by the selection exam and that the training is conducted only to them. Ten countries adopt this method. In other countries, the training period corresponds to the final selection step.

Q5.3 What types of training did the students receive? Please give the approximate time for each.

Hours	0	~5	~10	~15	~20	~40	41~
Problem-solving exercises	3	2	5	2	6	3	2
Laboratory work	0	2	3	1	11	4	2
Lectures	3	3	2	2	8	4	2
Tests	9	3	7	3	0	0	1
Other:	22	0	1*	0	0	0	0

*Visit to Pharmaceutical Company

The net training time for each country was compiled as follows:

Time/h	~9	~29	~49	~69	~89	~109	110~
No. of Countries	1	0	9	3	7	1	3

In comparison with the answer of **Q5.1**, every country with the training period of within a week has the total time of forty-nine hours or less. Countries taking 70~89 hours for training have training periods of 10~14 days.

Q5.4 What and how many people taught and trained the students?

High school teachers:	2 (4 and 12 trainers each)
University teachers:	13 (~5: 6, 6~10: 4, 11~: 2, No answer: 1)
HS and Univ. teachers:	4 (HS/UT 1/2, 2/5, 2/6, 7/5 each)
HS teachers and Former participants:	1 (3 and ?)
Univ. teachers and students:	2 (3 and 1, No answer)
Univ. teachers and Industrial chemists:	1 (5 and ?)
HS and Univ. teachers and Ind. chemists:	1 (3, 1, 1)

?: Figure not shown.

There are nineteen countries in which the university teachers are mainly in charge of the training. High school teachers are mainly in charge of the training in four countries.

Q5.5 If the student delegates were chosen from the finalists, how were the student delegates selected?

Mostly based on study camp or final step test achievement (seventeen countries), some considering the mark in the high school or that in the regional Olympiad.

Q5.5.2 Was any honor conferred on those who were not selected for the student delegates?

Yes: 8

Including the honorary or authorization certificates, prizes (book, etc.), or qualification for the entrance in the university as wishes.

Q5.6 Is it considered that the students learned something special other than knowledge and skill required for the IChO?

Yes:9 No: 14 No Answer: 1

Inquiry was made on the content to the countries which answered "yes".

Knowledge of chemistry required in university studies:	2
Interest and enthusiasm for chemistry:	2
Team work:	2
Meeting other talented youngsters:	2
Meeting university professors and/or good industrial chemists:	1
Domestic and world history, English, psychological training:	1
Practical working skills in laboratories:	1

Cost and Difficulties in Organizing

Queries were made on the financial bases supporting the prolonged participation for selection, training, and IChO stages.

Q6 How much were the expenses?

US\$:	Selection	Training	IChO
~500	2	1	0
~1,000	3	3	0
~2,000	5	9	0
~5,000	3	5	8
~10,000	0	2	12
~50,000	6	3	3
50,000~	3	0	0
No answer	1	1	1
Sponsored (Multiple selection):			
Academic	9	8	7
Government	17	18	19
Foundation	5	3	7
Private	7	9	6

The cost was summed up for each country and the distribution of the overall cost was shown below.

Total Cost/10 ³ US\$	~5	~10	~20	~30	~50	~100	101~
Number of Countries	1	6	6	3	4	0	3

Irrespective of the stages, the government bears all or part of the cost in about 2/3 to 3/4 of the countries. Scientific institutes partly bear it in about 1/3 of the countries. And in about 1/5 to 1/3 of the countries part of the cost is borne by the support from private enterprises and foundations.

Q7. Are there any difficulties or problems in participating (or continuing to participate) in the IChO?

No: 13

Yes 11

Nine countries claim budget problem. Other difficulties claimed are as follows:

Short of office equipment

Insufficient conditions for laboratory experiments

High participation fee

Insufficient number of mentors to cover the translation of IChO problems due to the structure of language

Criticism against the high scientific level and difficulty of the IChO tasks

Lack of school curriculums on national basis

The student delegates thereafter

Final set of questions are related to the privilege of the selected students and the course after they enter the university.

Q8.1 Are the qualified students such as student delegates to the IChO and finalists privileged to be admitted to (top-class) universities or receive scholarships?

No: 12

Yes: 12

All "yes" countries appointed the scholarship or grant for entrance in the university.

Q8.2 How many student delegates participated in the last five IChO?

Almost all answers are "four times years of participation".

Q8.3 Were the courses of the former student delegates having graduated from high schools followed?

Yes: 9 No: 11 No Answer : 4

Q8.4 If surveys were conducted into the former student delegates to the IChO now in the universities, what are the majors of the students participated in the last five IChO? If the exact numbers are not available, please only check the majors at least one student have specialized in.

Twenty-three countries gave an answer, among which ten specified the numbers and four indicated their trends.

Chemistry: 23 (Major*: 11 Minor: 3) Applied chemistry: 5

Chemical engineering: 14

Biochemistry: 5

Agricultural chemistry: 1	Pharmacology: 5
Physics: 6	Biology : 2
Other natural sciences: 3	
Mathematics: 2	Statistics: 0
Computer science: 10	Biotechnology: 1
Other engineering: 8 (Electronic: 1 Computer: 1 Telecommunication: 1)	
Medicine: 19 (Major*: 2)	
Business: 1	Economy: 1

* Majority of the student delegates took the course in the university.

References

- [1] IChO Survey Reply Sheet: url = <http://ce.t.soka.ac.jp/chem/ichorep.html>
 [2] 31st International Chemistry Olympiad (1999): url = <http://scicsws01.sci.ku.ac.th:80/~icho31/>
 [3] Countries Participating in the International Chemistry Olympiad (1998): url = <http://apamac.ch.adfa.oz.au/ASO/IChO/countries.html>

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