

SCHOOL DISTRICT OF PHILADELPHIA  
NINTH GRADE STUDENT ATTITUDES OF  
THE INTERACTIVE MATHEMATICS PROGRAM

Summary Report by:

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## Executive Summary

In May/June, 1994 an attitudinal survey was given to the Interactive Mathematics Program (IMP) students after one year of participation. One hundred and seventy one (171) **ninth grade** IMP students from four different schools responded. This represented 71% of IMP students in these schools.

The schools and respective number of students were as follows:

1) Carver High School for Engineering and Science	70
2) Dobbins Academic Vocational Schools	20
3) Philadelphia High School for Girls	52
4) Strawberry Mansion High School	29

Schools not surveyed were Central and Gratz High Schools. The attached tables are quantitative analyses of this survey data.

Positive findings:

This survey indicated that IMP students had very positive attitudes of the program. 71.3% of the students would opt to take the IMP curriculum again if offered the choice.

There were some interesting differences in the students' responses from different schools. Strawberry Mansion, a racially isolated comprehensive high school, seemed to have the most positive attitude towards the program, with 96.5% of them opting to take IMP again. They had few negative comments.

The responses from Dobbins were also very positive, with Carver and Girls' High slightly less positive. Although there were differences, the general trend was very similar and the responses scoring the highest were the same for all the schools, albeit to different degrees.

One of the most promising results from the survey were the responses to questions 8 and 9, regarding retention of concepts. The students seem to retain more mathematical concepts in IMP, than in their 8<sup>th</sup> grade math class.

Group work seemed to be the most popular aspect of the program. Although a few people did not like it, the vast majority (95.4%) did. They found it helped them to better understand math and made them feel as though they were not alone in their learning, especially when experiencing difficulties. At Girls' High there was an especially positive response (73.1% very positive and 25% somewhat positive). Even students who disliked or had difficulties with every other aspect of the program, liked the group work.

The students also liked learning a combination of mathematical topics, rather than only one isolated segment of mathematics, such as algebra or geometry. They felt they were learning a wider range of subjects than their peers in the traditional math class and felt confident and proud of the fact that they were learning concepts that they would ordinarily learn only in the 12<sup>th</sup> grade.

The students said that IMP makes math fun. They enjoyed the hands on activities and experiments and felt that it related to their lives. All these conditions seemed to increase student motivation, which hopefully will have a positive effect on their learning.

Students mentioned that their problem solving skills had improved and this was helping them in other courses and in real life to solve problems and to think things through.

Some of the students found the program easier than traditional algebra, yet others found it more difficult. Many of those who found it more difficult thought it was challenging, which they liked. Others, however, found the difficulty frustrating and felt more comfortable with the certainty and routine of their traditional math class.

One very positive sign is that when asked what they did not like about the program, a relatively large proportion of the students replied "nothing".

#### Negative findings:

Most negative attitudes were directly related to specific parts of the program. Some students expressed negative attitudes to the program as a whole as they did not feel that it was compatible with their learning style.

The most frequent dislike of the program was the homework. The students found it a difficult adjustment to be assessed on their homework and having to do their homework assignments everyday in order to pass. They also found the homework assignments difficult and confusing at times. Perhaps it may take an adjustment period to get used to the homework.

The responses to questions 5 are split more or less evenly between those that believed that the activities and instruction in IMP are helping them in other courses, and those that did not. On the surface, this may not seem that positive, however, the number of students responding affirmatively to the question, is unknown compared to if students in a traditional math program were asked the same questions. Perhaps this can be explored further in future research.

Selected quotes from students' surveys.

"I consider myself a writer, actress, singer, ANYTHING but a mathematician, but IMP makes me feel like I know."

"I am very good at math, but I do not like the formal method of teaching math. It never shows a connection to real life."

"I would choose IMP because I am really bad in math. With IMP my grades have been much better."

"IMP lets you deal with real situations that you would need when growing up."

"I feel what I have learned I will use a lot in life, no matter what my career is."

"I like working in groups instead of just myself, because if I don't understand something, someone of my age can help me."

"It is much harder, but I prefer a better challenge."

"Although this course was tough in the beginning, I'm glad I stuck with it because to my surprise - math is fun."

"Takes time to develop a liking to this program because it is very difficult in the beginning."

"I remember everything in this class that I learned. All that I remember from my 8<sup>th</sup> grade class is  $\pi=3.14$ ."

"It's easier to understand now because we do experiments to prove it instead of just taking the teacher's word for it."

"I feel very proud of being in this program because other kids in other courses don't learn as fast we do."

"It helps me organizing my info, explaining my thoughts into words and gives me different options when solving problems."

Next steps:

This year we intend to do a follow up survey of these students, now in their second year and do a similar survey for the students currently involved in the first year of the program. Also we plan to get some comparative data from non-IMP students on their attitudes towards mathematics.

**PHILADELPHIA NINTH GRADE STUDENT ATTITUDES  
OF THE INTERACTIVE MATHEMATICS PROGRAM  
May/June 1994**

**ALL SCHOOLS**

Number of students in the survey:

**171 out of 242**

1. HAVE YOU TAKEN ALGEBRA IN 8<sup>TH</sup> GRADE?

<b>Yes</b>	<b>64.3%</b>	No	33.9%	Undecided	0.0%	No Response	1.8%
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2. Questions About the Curriculum/Instruction	VERY POSITIVE	SOMEWHAT POSITIVE	NEGATIVE	VERY NEGATIVE	NO RESPONSE
A. How do you feel about the method by which you are being tested in math?	<b>27.5%</b>	<b>62.0%</b>	8.2%	2.3%	0.0%
B. How do you feel about working in groups?	<b>60.8%</b>	<b>34.6%</b>	2.3%	2.3%	0.0%
C. How do you feel about the writing component in your math class?	<b>22.8%</b>	<b>55.5%</b>	17.0%	4.1%	0.6%
D. How do you feel about the oral presentations that you are required to make?	<b>27.5%</b>	<b>49.1%</b>	17.0%	6.4%	0.0%
E. How do you feel about the type of homework assignments given to you in your math class?	<b>21.6%</b>	<b>56.7%</b>	13.5%	8.2%	0.0%

3. IN 12<sup>TH</sup> GRADE THERE IS AN OPTIONAL IMP COURSE. DO YOU PLAN TO TAKE IT?

<b>Yes</b>	<b>72.5%</b>	No	23.9%	Undecided	1.8%	No Response	1.8%
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4. IF YOU HAD TO CHOOSE YOUR MATH COURSE AGAIN, WHICH COURSE WOULD YOU TAKE?

<b>IMP</b>	<b>71.3%</b>	Algebra	26.9%	Undecided	1.2%	No Response	0.6%
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5. DO IMP ACTIVITIES AND METHODS OF INSTRUCTION HELP YOU IN YOUR OTHER COURSES?

<b>Yes</b>	<b>46.8%</b>	No	49.1%	Undecided	1.8%	No Response	2.3%
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(#6, 7 Open-ended questions, see attached)

8. ARE YOU ABLE TO RETAIN THE CONCEPTS THAT ARE TAUGHT IN YOUR IMP CLASS?

<b>Yes</b>	<b>83.6%</b>	No	8.8%	Some	5.3%	No Response	2.3%
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9. WERE YOU ABLE TO RETAIN THE CONCEPTS TAUGHT IN YOUR 8<sup>TH</sup> GRADE MATH CLASS?

<b>Yes</b>	<b>71.9%</b>	No	20.5%	Some	5.3%	No Response	2.3%
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(#10, 11 Open-ended questions, see attached)

**PHILADELPHIA NINTH GRADE STUDENT ATTITUDES  
OF THE INTERACTIVE MATHEMATICS PROGRAM  
May/June 1994**

**SCHOOL: STRAWBERRY**      Number of students in the survey:      **29 out**  
**of 34**  
**MANSION**

1. HAVE YOU TAKEN ALGEBRA IN 8<sup>TH</sup> GRADE?

<b>Yes</b>	<b>13.7%</b>	No	79.3%	Undecided	0.0%	No Response	0.0%
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2. Questions About the Curriculum/Instruction	VERY POSITIVE	SOMEWHAT POSITIVE	NEGATIVE	VERY NEGATIVE	NO RESPONSE
	A. How do you feel about the method by which you are being tested in math?	<b>34.5%</b>	<b>65.5%</b>	0.0%	0.0%
B. How do you feel about working in groups?	<b>62.1%</b>	<b>37.9%</b>	0.0%	0.0%	0.0%
C. How do you feel about the writing component in your math class?	<b>31.0%</b>	<b>65.5%</b>	3.5%	0.0%	0.0%
D. How do you feel about the oral presentations that you are required to make?	<b>41.4%</b>	<b>44.8%</b>	10.3%	3.5%	0.0%
E. How do you feel about the type of homework assignments given to you in your math class?	<b>34.5%</b>	<b>51.7%</b>	6.9%	6.9%	0.0%

3. IN 12<sup>TH</sup> GRADE THERE IS AN OPTIONAL IMP COURSE. DO YOU PLAN TO TAKE IT?

<b>Yes</b>	<b>96.5%</b>	No	0.0%	Undecided	0.0%	No Response	3.5%
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4. IF YOU HAD TO CHOOSE YOUR MATH COURSE AGAIN, WHICH COURSE WOULD YOU TAKE?

<b>IMP</b>	<b>96.5%</b>	Algebra	3.5%	Undecided	0.0%	No Response	0.0%
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5. DO IMP ACTIVITIES AND METHODS OF INSTRUCTION HELP YOU IN YOUR OTHER COURSES?

<b>Yes</b>	<b>62.0%</b>	No	34.5%	Undecided	0.0%	No Response	3.5%
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(#6, 7 Open-ended questions, see attached)

8. ARE YOU ABLE TO RETAIN THE CONCEPTS THAT ARE TAUGHT IN YOUR IMP CLASS?

<b>Yes</b>	<b>89.7%</b>	No	0.0%	Some	0.0%	No Response	10.3%
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9. WERE YOU ABLE TO RETAIN THE CONCEPTS TAUGHT IN YOUR 8<sup>TH</sup> GRADE MATH CLASS?

<b>Yes</b>	<b>72.4%</b>	No	17.2%	Some	0.0%	No Response	10.3%
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(#10, 11 Open-ended questions, see attached)

**PHILADELPHIA NINTH GRADE STUDENT ATTITUDES  
OF THE INTERACTIVE MATHEMATICS PROGRAM  
May/June 1994**

**SCHOOL: DOBBINS  
of 31**

Number of students in the survey:

**20 out**

1. HAVE YOU TAKEN ALGEBRA IN 8<sup>TH</sup> GRADE?

<b>Yes</b>	<b>36.6%</b>	No	61.5%	Undecided	1.9%	No Response	0.0%
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2. Questions About the Curriculum/Instruction	VERY POSITIVE	SOMEWHAT POSITIVE	NEGATIVE	VERY NEGATIVE	NO RESPONSE
A. How do you feel about the method by which you are being tested in math?	<b>35.0%</b>	<b>65.0%</b>	0.0%	0.0%	0.0%
B. How do you feel about working in groups?	<b>55.0%</b>	<b>35.0%</b>	10.0%	0.0%	0.0%
C. How do you feel about the writing component in your math class?	<b>30.0%</b>	<b>60.0%</b>	5.0%	0.0%	5.0%
D. How do you feel about the oral presentations that you are required to make?	<b>30.0%</b>	<b>45.0%</b>	20.0%	5.0%	0.0%
E. How do you feel about the type of homework assignments given to you in your math class?	<b>20.0%</b>	<b>60.0%</b>	15.0%	5.0%	0.0%

3. IN 12<sup>TH</sup> GRADE THERE IS AN OPTIONAL IMP COURSE. DO YOU PLAN TO TAKE IT?

<b>Yes</b>	<b>90.0%</b>	No	5.0%	Undecided	0.0%	No Response	5.0%
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4. IF YOU HAD TO CHOOSE YOUR MATH COURSE AGAIN, WHICH COURSE WOULD YOU TAKE?

<b>IMP</b>	<b>85.0%</b>	Algebra	15.0%	Undecided	0.0%	No Response	0.0%
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5. DO IMP ACTIVITIES AND METHODS OF INSTRUCTION HELP YOU IN YOUR OTHER COURSES?

<b>Yes</b>	<b>45.0%</b>	No	45.0%	Undecided	0.0%	No Response	10.0%
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(#6, 7 Open-ended questions, see attached)

8. ARE YOU ABLE TO RETAIN THE CONCEPTS THAT ARE TAUGHT IN YOUR IMP CLASS?

<b>Yes</b>	<b>95.0%</b>	No	0.0%	Some	5.0%	No Response	0.0%
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9. WERE YOU ABLE TO RETAIN THE CONCEPTS TAUGHT IN YOUR 8<sup>TH</sup> GRADE MATH CLASS?

<b>Yes</b>	<b>80.0%</b>	No	15.0%	Some	5.0%	No Response	0.0%
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(#10, 11 Open-ended questions, see attached)

**PHILADELPHIA NINTH GRADE STUDENT ATTITUDES  
OF THE INTERACTIVE MATHEMATICS PROGRAM  
May/June 1994**

**SCHOOL: CARVER  
of 86**

Number of students in the survey:

**70 out**

1. HAVE YOU TAKEN ALGEBRA IN 8<sup>TH</sup> GRADE?

<b>Yes</b>	<b>85.7%</b>	No	14.3%	Undecided	0.0%	No Response	0.0%
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2. Questions About the Curriculum/Instruction	VERY POSITIVE	SOMEWHAT POSITIVE	NEGATIVE	VERY NEGATIVE	NO RESPONSE
A. How do you feel about the method by which you are being tested in math?	<b>32.9%</b>	<b>50.0%</b>	12.9%	4.2%	0.0%
B. How do you feel about working in groups?	<b>52.9%</b>	<b>40.0%</b>	1.4%	5.7%	0.0%
C. How do you feel about the writing component in your math class?	<b>21.4%</b>	<b>54.3%</b>	18.6%	5.7%	0.0%
D. How do you feel about the oral presentations that you are required to make?	<b>28.6%</b>	<b>47.1%</b>	14.3%	10.0%	0.0%
E. How do you feel about the type of homework assignments given to you in your math class?	<b>27.1%</b>	<b>54.3%</b>	10.0%	8.6%	0.0%

3. IN 12<sup>TH</sup> GRADE THERE IS AN OPTIONAL IMP COURSE. DO YOU PLAN TO TAKE IT?

<b>Yes</b>	<b>62.9%</b>	No	34.3%	Undecided	1.4%	No Response	1.4%
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4. IF YOU HAD TO CHOOSE YOUR MATH COURSE AGAIN, WHICH COURSE WOULD YOU TAKE?

<b>IMP</b>	<b>68.6%</b>	Algebra	27.2%	Undecided	2.8%	No Response	1.4%
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5. DO IMP ACTIVITIES AND METHODS OF INSTRUCTION HELP YOU IN YOUR OTHER COURSES?

<b>Yes</b>	<b>48.6%</b>	No	47.1%	Undecided	2.8%	No Response	1.4%
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(#6, 7 Open-ended questions, see attached)

8. ARE YOU ABLE TO RETAIN THE CONCEPTS THAT ARE TAUGHT IN YOUR IMP CLASS?

<b>Yes</b>	<b>78.6%</b>	No	14.3%	Some	5.7%	No Response	1.4%
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9. WERE YOU ABLE TO RETAIN THE CONCEPTS TAUGHT IN YOUR 8<sup>TH</sup> GRADE MATH CLASS?

<b>Yes</b>	<b>68.6%</b>	No	24.3%	Some	5.7%	No Response	1.4%
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(#10, 11 Open-ended questions, see attached)

**PHILADELPHIA NINTH GRADE STUDENT ATTITUDES  
OF THE INTERACTIVE MATHEMATICS PROGRAM  
May/June 1994**

**SCHOOL: GIRLS' HIGH  
of 91**

Number of students in the survey:

**52 out**

1. HAVE YOU TAKEN ALGEBRA IN 8<sup>TH</sup> GRADE?

<b>Yes</b>	<b>63.5%</b>	No	34.6%	Undecided	0.0%	No Response	1.4%
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2. Questions About the Curriculum/Instruction	VERY POSITIVE	SOMEWHAT POSITIVE	NEGATIVE	VERY NEGATIVE	NO RESPONSE
A. How do you feel about the method by which you are being tested in math?	<b>13.5%</b>	<b>75.0%</b>	9.6%	1.9%	0.0%
B. How do you feel about working in groups?	<b>73.1%</b>	<b>25.0%</b>	1.9%	0.0%	0.0%
C. How do you feel about the writing component in your math class?	<b>17.3%</b>	<b>50.0%</b>	26.9%	5.8%	0.0%
D. How do you feel about the oral presentations that you are required to make?	<b>17.3%</b>	<b>55.8%</b>	23.1%	3.8%	0.0%
E. How do you feel about the type of homework assignments given to you in your math class?	<b>7.7%</b>	<b>61.5%</b>	21.2%	9.6%	0.0%

3. IN 12<sup>TH</sup> GRADE THERE IS AN OPTIONAL IMP COURSE. DO YOU PLAN TO TAKE IT?

<b>Yes</b>	<b>65.4%</b>	No	30.8%	Undecided	3.8%	No Response	0.0%
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4. IF YOU HAD TO CHOOSE YOUR MATH COURSE AGAIN, WHICH COURSE WOULD YOU TAKE?

<b>IMP</b>	<b>55.8%</b>	Algebra	44.2%	Undecided	0.0%	No Response	0.0%
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5. DO IMP ACTIVITIES AND METHODS OF INSTRUCTION HELP YOU IN YOUR OTHER COURSES?

<b>Yes</b>	<b>36.6%</b>	No	61.5%	Undecided	1.9%	No Response	0.0%
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(#6, 7 Open-ended questions, see attached)

8. ARE YOU ABLE TO RETAIN THE CONCEPTS THAT ARE TAUGHT IN YOUR IMP CLASS?

<b>Yes</b>	<b>82.7%</b>	No	9.6%	Some	7.7%	No Response	0.0%
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9. WERE YOU ABLE TO RETAIN THE CONCEPTS TAUGHT IN YOUR 8<sup>TH</sup> GRADE MATH CLASS?

<b>Yes</b>	<b>73.1%</b>	No	19.2%	Some	7.7%	No Response	0.0%
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(#10, 11 Open-ended questions, see attached)