

8/27/87

PHILOSOPHY STATEMENT

I. DESCRIPTION

- A. 3 year residential school for Illinois students highly gifted in math and science - created by SB 730 as part of reform legislation.
- B. 1983 CPEE - Needs assessment - losing talented resources - Dr. Lederman - need for scientific literacy - decision making
- C. Students enter as sophomores and leave after 3 years prepared as sophomores in college
- D. Presently have 388 students; will have 700 in September, 1989
- E. Living in dormitories in building; music rooms and science labs
- F. Two dormitories completed in April; three more completed within month
- G. Breaking ground for four more to be completed next fall; full capacity 800-900 students

II. MISSION

The Illinois Mathematics and Science Academy was created to inspire and challenge young boys and girls gifted in mathematics and scientific ability in a manner which will maximize the use of these talents for the benefit of society.

- A. Foster interdisciplinary approaches to thinking and learning
- B. Approach math and science as by products of human creativity

III. GOALS

..To provide an educational, social and emotional climate in which students with exceptional aptitude in mathematics and science can develop their intellectual gifts and become committed to the search for humane solutions to our world's problems.

..To serve as a laboratory for the development, testing and dissemination of innovative techniques in mathematics, science and the humanities which can become a resource for secondary school teachers in Illinois and the nation.

Give back orientation - work service - community service

MYTHS HANDICAPPING GIFTED EDUCATION

1. Cream always rises to the top.
2. Gifted students will make it on their own. Not necessary to differentiate instruction or instructional opportunities because they can develop the resource they need to succeed on their own.
3. Should not be accelerated - detrimental to social and emotional growth. Research indicates more maturity and better social adjustment.
4. Talent may be misplaced; but it can't be erased.
5. Law of compensation - if you are smart; can't be good athletically.
6. Potentially all children are gifted.
7. Gifted education is nothing more than good teaching.

MYTHS HANDICAPPING GIFTED EDUCATION (CONTINUED)

8. Gifted students have unique needs; they need to be challenged
- a. by mastery-level work in areas of strengths and interest
 - b. by exposure to new areas of learning
 - c. by the opportunity to see relationships among all bodies of knowledge
 - d. by experiences that promote understanding of human value systems
 - e. through discussions with intellectual peers
 - f. by activities at complex levels of thought
 - g. through opportunities for divergent production, opportunities for the creation of new knowledge; and
 - h. by opportunities for working on REAL problems.

This was the purpose of the Academy.

NATIONAL DEFINITION OF GIFTED
1972

Gifted and talented children are those identified by professionally qualified persons who by virtue of outstanding abilities, are capable of high performance.

These are children who require differentiated educational programs and/or services beyond those normally provided by the regular school program in order to realize their contribution to self and society.

WHAT IS GIFTED CHILD

General Categories

1. General Intellectual
2. Specific academic aptitude
3. Creative and productive thinking
4. Leadership ability
5. Verbal and performing arts
6. Psychomote

Gallagher - the ability to manipulate internally learned symbol system - the students ability to learn on their own, imagine and create new focus and products; information processing skills.

7. Mathematics, music and chemistry - all constitute symbol systems
8. Mental Functions: short term memory
long term memory
association
reasoning/convergent and divergent
9. Task commitment and creativity

ISSUE OF ELITISM AND CLOISTERED ELITISM

1. Elitism is separated by social class - food stamps
2. Academy represents an aggregation of talent
3. Just like Chicago Symphony and Chicago Bears
4. Discomfort with assembly of academically bright and talented
5. Vacuum - home in wealthy area - North Shore
6. Arrogance is gone

ISSUE OF PUBLIC WELFARE

Obviously, we are separating a group of our population, but we are separating them so they may serve all of us. The Academy is operated in such a way that students of rare talent are recruited from throughout Illinois, from all racial, social, and economic strata, and that there is no bias toward any particular class of student.

In our judgment, it is the gifted student for whom education should mean the most. None can potentially derive greater benefits from a close emersion in the intellectual and technical heritage of our civilization, and none can potentially contribute more than young people of rare talent. Not to provide all that can be done to encourage their contribution seems to me to be a profound misreading of the concept of public welfare.

As a product of the cooperative efforts of all educational constituents, the Academy will be a breeding place for productive educational innovation, and will set standards that other states and schools will be forced to emulate.

JUSTIFY NEED

Gifted students have unique needs:

1. Students with very special needs - PL 94-142; at risk of failing to make a successful transition to adulthood.

As a matter of fact, gifted students are in many ways, at risk.

According to recent study by Margaret LeCompete, and anthropologist and former school administrator in Houston, the students most at risk for dropping out of school have traditionally been those from low-income or single-parent families and those from minority groups, especially blacks, Hispanics and Indians, said LeCompete, who is on leave from the University of Cincinnati.

But that has changed dramatically. "Dropping out has become gentrified," she said in a study prepared for a presentation. "The new dropouts include the very young, the middle class, the gifted and bored, the young parent, the ideologically committed and a host of others.

Twenty-five percent of the known dropouts were in the top quarter of their classes in reading and mathematics scores, she said. Some of the dropouts studied ranked in the top 5 percent, she said.

2. Federal legislature - by virtue of their special ability require differentiated instruction in order to reach their full potential.

PL 95-561 Title IX

The profound nature of gifted children's potential contributions to society was recognized in Congress's declaration that:

the Nation's greatest resource for solving critical national problems in areas of national concern is its gifted and talented children,

unless the special abilities of gifted and talented children are developed during their elementary and secondary school years, their special potentials for assisting the Nation may be lost, and

gifted and talented children from economically disadvantaged families and areas often are not afforded the opportunity to fulfill their special and valuable potentials, due the inadequate or inappropriate educational services.

3. Bloom - strong evidence that no matter what an individual's gifts are, unless there is a long and intensive process of coordination and training, they will not attain extreme level of capability.

PL 95-561 Title IX, Part A, Section 901

4. Erosion of intellectual talent in math and science; losing most capable students; research indicates that budgetary deficiencies and educational inadequacies are 2 factors in teachers' inability to spark enthusiasm in youngsters; also inadequate research and lab experience, and little opportunity for individual study.
5. Conclusion of State Board of Education, March 3, 1987

One group of gifted students for whom it is especially challenging to provide appropriate educational programs is exceptionally gifted -- the top .5 of 1% -- who are so significantly different from their peers that they require dramatically different educational programs. In 1977, the State Board of Education initiated the Illinois Statewide Talent Search -- a procedure designed to identify highly gifted students in the 6th and 7th grades and to channel them into regional "fast-paced" programs planned and coordinated through the Educational Service Centers. These programs are frequently provided by higher education institutions and focus on subjects or levels not available in most local school districts. The activities are usually held on a Saturday, before and after school, and/or during the summer.

Little is known about the extent to which these programs offer opportunities consistent with student needs, and almost nothing is known about how such activities relate to the rest of the student's educational experience. There is, in fact, a dearth of information at the state level about what local districts do for highly gifted students at any time during their school years. However, based on informal information received from local school districts, it is believed that these students present such a unique challenge that even some of the most sophisticated schools in the state are unable to provide the advanced and specialized opportunities these students need. Services seem to be at best fragmentary and at worst, nonexistent. Once again, the state is not reasonably assured that appropriate educational programs are available to gifted and talented students.

STUDENT PROFILE 1987-1988

	Class of 1989	Class of 1990	Total
Number Students	184	202	386
Number Males	105	113	218
Number Females	79	89	168
Number White	137 (74%)	133 (66%)	270 (70%)
Number Black	12 (7%)	20 (10%)	32 (8%)
Number Asian	28 (15%)	40 (20%)	68 (18%)
Number Hispanic	6 (3%)	4 (2%)	10 (3%)
Other	1	1	2
Chicago & Suburbs	104 (57%)	109 (54%)	213 (55%)
Other	80 (43%)	93 (46%)	173 (45%)
GPA	3.9	3.86	
SAT M	620	607	
SAT V	537	521	

SELECTION PROCESS

1. Applications - applicants are nominated - Due 3/1;
Received _____
 - A. Student applicant completes form and responds to questionnaire
 - (1) What way would IMSA enhance your goals and develop as potential leader or scholar
 - (2) What contribution can you make to IMSA and what will you do to promote its mission
 - (3) Awards, certificates, recognition
 - (4) Extra curricular, community involvement
 - (5) Special interests
 - B. Evaluation
 - comment on curiosity creativity, and intelligence ability in math and science
 - comment on special activities, projects and initiative
 - characteristics/behaviors
observation, inquisitive, experimenting, persistent, self-starter, innovator, analytical leadership

USED ACCOMPLISHMENT-BASED ASSESSMENT
TASK COMMITMENT

1. Recognized accomplishment suggests drive
2. Individual accomplishments in one area are usually indication of accomplishment in others as well
3. Best predictor of future accomplishment is record of past accomplishment

RATED IN 5 AREAS

1. Mathematical reasoning
2. Scientific reasoning
3. Communication ability
4. Interpersonal relations
5. Performance ability

FACULTY - Acadmic excellence; innovative; nurturing

8 Administrators

3 Supervisors

34 full - time

5 half - time

18 Resident counselors - All BA's

All full time have Masters Degree

12 Ph.D.'s on staff

Administrators Supervisors Teachers Counselors Total %

Male	3	3	25	10	41
Female	5	0	14	8	27

Unique

Risk-Takers; experimentors, deal with ambiguity; sense of adventure; pioneers; 1 year contract

SEE ATTACHED STAFF DEMOGRAPHICS

ADVERTISING

What have you done in education that is remarkable?

ILLINOIS MATHEMATICS AND SCIENCE ACADEMY

Course Offerings 1987-1988MATHEMATICS

- 006 Geometry Inter. Algebra I & II
- 009 Advanced Algebra/Trigonometry I & II
- 012 Analysis I & II
- 018 Introduction Calculus/Analytical Geometry I & II
- 021 Calculus/Analytical Geometry
- 027 Analysis II/Introduction Calculus
- 033 Intro. Calculus/Analytical Geometry/Multivariate Calculus
- 034 Computer Applications in Math
- 035 Problem Solving in Math
- 036 Computer Languages

LANGUAGES

- 501/04 French I, II, III, IV
- 511/514 Spanish I, II, III, IV
- 521/524 German I, II, III, IV
- 531/534 Latin I, II, III, IV
- 541/543 Russian I, II, III
- 551/553 Japanese I, II, III

ART

- 701 Art Survey
- 711 Ceramics
- 721 Photography

SCIENCE

- 121 Organic Chemistry
- 131 Astro Physics

MUSIC

- 801 Chrous
- 812 Band
- 822 Orchestra

PHYSICAL EDUCATION

- 601 PE 10 (Drivers Ed.)
- 611 PE 11
- 621 PE 12

2-PERIOD COMBINATIONSScience - Language Arts - Social Studies

- 201 Int. Science I (Physics & Chemistry)
- 211 Int. Science II (Biology/Mod. Physics/Research & Computers)
- 221 Literature/American Studies (Intro. to Literature & Humanities/American Studies)
- 231 World Literature/World Studies (World Literature/World Studies)

PROGRAM

FRANK NEWMAN - CHAIRMAN EDUCATION COMMISSION FOR THE STATES

SIX DEMANDS FOR SUCCESS

1. Education must be rigorous (higher level thinking and higher level of information.
2. Must increase skills in math and science.
3. Must increase opportunity for creativity and problem-solving
4. Must increase self-confidence so children get experience being in charge of their lives.
5. Must understand nature of international life and global interdependence
6. Must develop sense of community responsibility

CURRICULAR PROGRAM

1. Academic rigor - heart of program - need to know before can create. Academic rigor calls for the reintegration of the education of gifted into fundamental academic subjects in which excellence thrives and grows; now make and take gimmicky projects.
2. Curriculum has 4 goals
 - A. To develop intellectual potential, academic achievement, creativity and responsibility for all students.
 - B. Approach math and science as products of human creativity and curiosity
 - C. To foster interdisciplinary approaches to thinking and learning while integrating the study of math, nature and social science with arts and humanities.
 - D. To cultivate environment that is stimulating, nurturing, and bias free.
3. Interdisciplinary and integrated
4. 6 subjects and P.E.
5. Mathematical Inquiry - Algebra - Geometry - Trigonometry
Calculus
Integrative Science - Chemistry - Physics
English
Social Science
Foreign Language (French, Spanish, German, Latin, Russian)
Japanese, Mandarin Chinese
6. 7:45-3:15
7. Saturday Seminars 1 per month
8. Mentor Program - 3 Phases
 - a. tours - field trips
 - b. small group dinners
 - c. individual projects
9. Apprentice Investigators
10. Writing emphasis
11. Inquiry, problem-solving are Academy emphases
12. Experimentation & collaborative risk-taking are the behavioral norms and not the behavioral by products of this environment
13. Not all will go on in math and science; but all will be leaders; our focus is problem solving and problem finding and decision making within an ethical context.

SCIENCE INSTRUCTION LAGS IN U.S. SCHOOLS

COPLEY NEWS SERVICE - 8/12/87

U.S. schools produce some of the finest scientists on earth - more Nobel Prize winners than any other nation. At the same time, they perpetuate one of the most scientifically ignorant populations in the industrial world.

For every scientist who broadens the boundaries of knowledge, many more Americans believe astrology is a genuine science or think space shots change the weather.

But science is not a question of multiple choice. It is a mode of thinking, disciplining the mind to observe keenly, evaluate carefully and conclude logically. Science instruction does not conform to regimentation, which is the easiest way to teach.

As a result, schools often shy away from innovative science instruction because measuring achievement is so hard.

Science education in U.S. public schools is incredibly varied. In cities with high-tech industries, science has generally a high priority. In other places it barely exists.

Damage from such gaps is revealed in comparisons between U.S. students and their peers elsewhere in the world. Preliminary research from the Second International Science Study indicates U.S. students, even those in advanced classes, lag well behind students in England, Japan and several other countries.

Beyond that, the study showed that science achievement has not improved. Scores taken in 1986 were at or below the level attained in 1970.

It is the quality of science education on the whole that most concerns educators. They say it will not improve significantly, particularly at the secondary level, unless more qualified math and science teachers are recruited.

In 1983, the National Science Foundation reported that nearly half of the nation's math and science teachers were underqualified, working with emergency credentials or simply filling vacancies.

1. Music and Fine Arts
 - Chorus
 - Instrumental
 - Photography

2. Athletics
 - Basketball
 - Volleyball
 - Soccer
 - Track
 - Cross Country
 - Swimming
 - Bowling

3. Academic Competition - 3 trophies
 - Math Team -
 - Future Problem Solving Bowl
 - PLD Simulation
 - Olympiad
 - Westinghouse
 - Intech

4. State Chess Champions

5. Sixth Place ICTM

6. First Place Freshman Algebra

RESEARCH EFFORT

1. NCSSM & Louisiana
2. Hunter and Bronx; Houston; Fairfax County;
3. NSF
4. Spencer - Wingspread
5. Our own research SASA
6. Longitudinal data - Julian Stanley

NATIONAL ADVISORY BOARD

Initiated by Governor

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OUTREACH

Serve as a laboratory for research and experimentation in curricular development and development of instructional strategy.

Collaboration - Impact of Science

1. Curriculum development
2. Inservice training
3. Summer institute; training camps
4. Exchange teachers and faculty
5. Teach vocational programs in technology
6. Mentor programs for students
7. Video tape and lecture programs, experiments
8. Speakers and programs - Academy speakers on tape - Academy lecture series
9. Instructional network
10. PLATO - Uni High; University of Illinois
11. Tele-communication network
12. Academy Fellows
13. NSF Grant
14. ESC Grant
15. University Affiliates

ECO NEED FOR THIS SCHOOL - HIGHER EDUCATION - DUPAGE

1. Ties to Eco-development- Illinois suffers from national misconceptions of scientific and technological planning (SSC)
2. Need for scientifically and technologically literate population - making informed decisions
3. Intricate context of scientific and technological decision making
4. Langdon Winner
 - A. Whale and the Nuclear Reactor- Star Trek IV
 - B. San Luis Obispo California - Diablo canyon nuclear power plant
 - C. Juxtaposition of whale and reactor symbolizes need for philosophy of technology
 - D. Technological somnambulism
 - E. In an age which the inexhaustable power of scientific technology makes all things possible, it remains to be seen where or if we will draw line; where we will be able to say; here are the possibilities that wisdom says we avoid - Winner

Context of ethical decision-making

Philosophy

Robert Moses - Causeway - Jones Beach

Cultivate risk taking, creativity, probing, experimentation within an external framework - balance math /science and humanities

ADJUSTMENTS

1. PARENTS

can't hover
love but not miss
can't put arm around
it's the right place - child belongs

2. KIDS

a. safe
b. friends
c. accepted
d. can ask questions
e. not nerd
f. ok to study
g. can be self finally
h. less competition
i. it's good to be home
j. typical students
 underground newspaper
 very few discipline

3. REPORT CARDS

grades
no ranking
no GPA

"Well, I guess you were serious"

Reading papers

BUDGET

A. FY-87

1. Requested 8.3; fallback 5.8
2. Received 3.5; 16,666 per pupil
3. Dramatically underfunded

- A. No computers; labs
- B. Library
- C. Transportation
- D. Principal
- E. Heavy teaching load
- F. Equipment
- G. Fine and performing arts

B. FY-88

1. Requested 86. for 440
2. Received 3.5 for 400

C. IMSA Fund

1. 300,000 Furnas - IRC
2. 50,000 Banks
3. 20,000 Burroughs Welcome
4. Hire Development Office and Research Assistant
5. 15-20 Million Dollar Campaign

Corporate
Foundations

D. Parents Fund

KALEIDOSCOPE OF IMAGE AND IMPRESSIONS

1. IMSA is more than sum of parts
2. Living and Learning environment
3. Faculty /administrative exchange and collaboration
4. Faculty/student exchange
5. Study 10:00 at night - faculty and kids on floor
6. Stimulating, synergistic environment
7. Teachers say feel professional for first time - should be able to market that (Carnegie)
8. My day

Began with governor and ended with:

Dr. Marshall, I just got my first A in physics - would you please give me a hug?

9. Illinois has rare opportunity
10. Visited by Korea, China, Puerto Rico
11. Indiana, Oklahoma, California, Maryland, New York
New York commissioner - Illinois will be the best
12. Illinois can have something very special for talented youth
13. Seen as a laboratory for innovation
14. Have an opportunity in Illinois to celebrate the development of potential for all talents
15. To develop a culture of empowerment for teachers - students
16. Success of America's Cup - Frank Newman
 - A. Sophisticated use of technology
 - B. Extraordinary training and knowledge
 - C. Risk-taking leadership
 - D. Willingness to ask "Are we doing it right and can we do it better"

17. Aristotle said that the future of empires depends upon the education of youth.

Academy represents another option

18. Underlying Philosophy

If we do what we know and feel is right, it is bound to happen that among our graduates there will numbered scientists, engineers, and those who go on to earn degrees in law and letters. There are likely to be those few, who create new intellectual worlds, cure a dreaded human ailment or in some other way significantly influence life on our planet. Our philosophy will be to treat our charges as if each one is capable of this extraordinary achievement. Only one such product will make the effort and expense of the school for its entire duration worthwhile.

CLOSE: Isn't It Strange - R. C. Sharpe

Isn't it strange
That princes and kings
And clowns that caper
In sawdust rings
And common people
Like you and me
Are builders for eternity?
Each is given a bag of tools,
A shapeless mass,
A book of rules;
and each must make
Ere life is flown,
A stumbling block
Or a stepping stone.

In an article printed in Educational Leadership, Isaac Wirzulp, who is a professor of mathematics at the University of Chicago, said the following, "We must acknowledge that an educated population and a well trained work force are essential to the recovery of our country's dynamic spirit and economic strength. We must go beyond mere recognition of the problem and mount a serious effort, a genuine national mobilization for education. To give up, to procrastinate or to plan only for short term would be to mortgage our freedom and our future."