

*2009 Visions of  
Computer Sciences Lecture*

**Socrates, Moore,  
and Computer Science  
Education**

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Department of Computer Sciences  
The University of Texas at Austin  
November 9, 2009*

Outline:

## Outline:

- The experience with Halmos

## Outline:

- The experience with Halmos
- The effect on me

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- The experience with Halmos
- The effect on me
- How about computer science courses

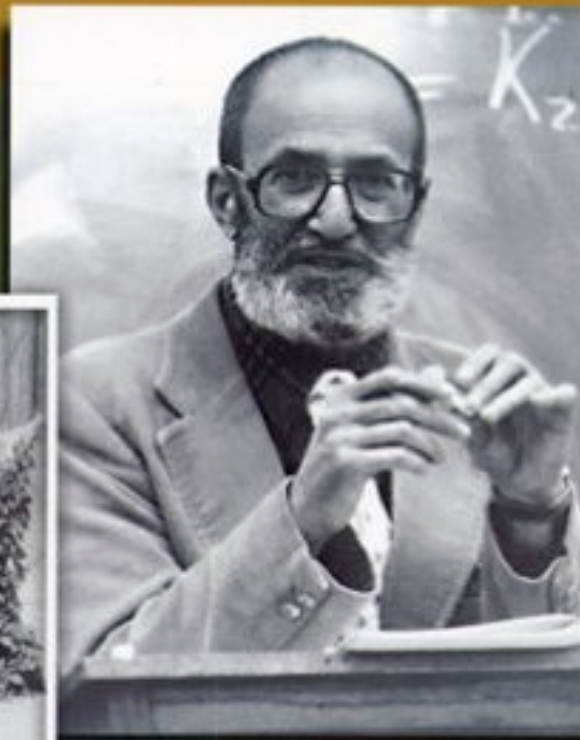
And now for something entirely different...

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The presentation of the Holloway Award

# My Moore Method course with Paul Halmos





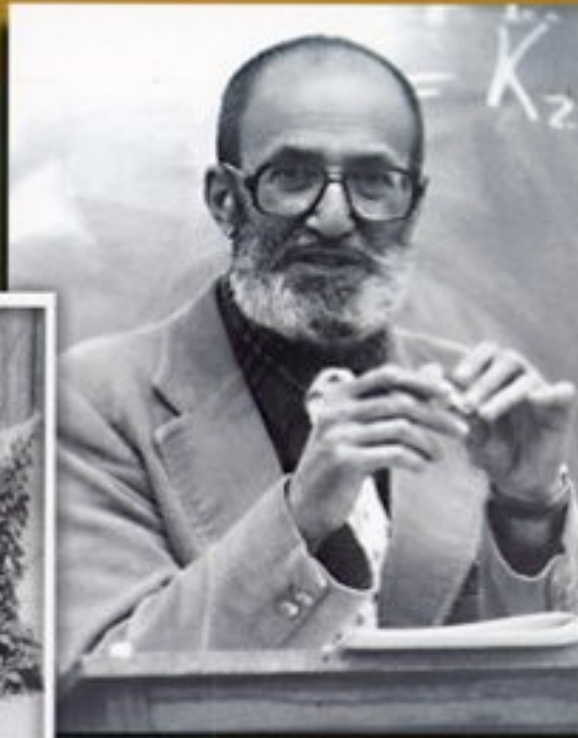
I Want to Be

a Mathematician...

*an auto-mathography*

---

Paul R. Halmos



I Want to Be

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Paul R. Halmos

What was he like?

# My Moore Method course with Paul Halmos

Set the scene:

Spring semester, 1968

University of Michigan

Functional Analysis I

7-8 students including one undergraduate

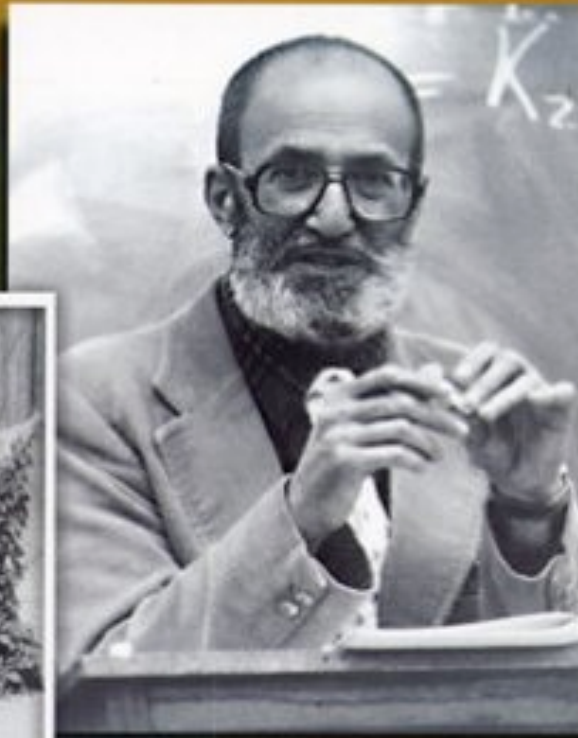
## First Day Instructions:

- Moore Method or Lectures?
- Halmos:
  - “Borderline too large”
  - “ $2/3$  coverage with Moore Method”
  - “Not like freshman doing homework on the board”
  - “If it takes 30-40 hours of preparation per week, that’s what it takes”

## The Format:

- Consult no books
- No collaboration
- Three one hour meetings per week
- Halmos generally called on students to present
- Sometimes he asked for volunteers
- Two or three or four presentations per class
- Following student presentations, he introduced definitions then the theorems and problems (meaning theorems not subsequently used) for us

# The Course Changed my Life



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*Was this good or bad?*

# The Course Changed my Life

- A lifelong mastery of the material

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- Nonreliance upon books, or journals, or colleagues

# The Course Changed my Life

How much of that was caused by the  
Moore Method ?

and

How much of that was caused by my own  
situation ?



# Moore Method Courses

Paul Halmos:

“Some say that the only possible effect of the Moore method is to produce research mathematicians, but I don't agree. The Moore method is, I am convinced the right way to teach anything and everything. It produces students who can understand and use what they have learned. It does, to be sure, instill the research attitude in the student – the attitude of questioning everything and wanting to learn answers actively – but that's a good thing in every human endeavor, not only in mathematical research.

“There is an old Chinese proverb that I learned from Moore himself:

*I hear, I forget;*

*I see, I remember.*

*I do, I understand.”*

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French?

...

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At one point courses were being offered by

- Bob Boyer,
- Vladimir Lifschitz,
- J Moore,
- Alan Cline

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... which was more than the UT Mathematics Department.

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- class size,
- instructor,
- material,
- and (possibly) resources,

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The instructor must be prepared to listen carefully to questions...

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# So, When is the Moore Method Suitable for Computer Science Courses?

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- class size, if oral presentations, small enough to keep pressure
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- and (possibly) resources, graders for large classes

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So When is **Something Like** the Moore  
Method Suitable for Computer  
Science Courses?



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Almost always

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**(in some form or another)**

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and we may be already doing it

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**(in some form or another)**  
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gives students the feeling of discovery and  
personal participation in the process.

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or programming

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but it is important that students know enough about the what  
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How do I know when I am wrong?

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How do I know when I am wrong?

How do I know when I should do better?



“Here’s an outline of the  
problem,  
what would you do?”

“Here’s an outline of the  
problem,

what would you do?”

“And what would you do next?”

And what should **WE** do next?

And what should **WE** do next?

Listen to Jay Misra