

COVER SHEET for POSITION STATEMENT

On

The Use of Technology in Mathematics Education

Submitted by the Technology in Mathematics Education Committee

____ Concept Approval by the AMATYC Board

____ First Review by the AMATYC Editing Director

____ Board Review

____ Input Hearing

____ Second Review by AMATYC Editing Director

____ Professional Editing

____ Board Review for Endorsement

____ Final Hearing

____ Delegate Assembly Approval

Hearing Dates:

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- What need does this position statement address?

Since 1984, the Technology in Mathematics Education (TiME) Committee has proposed several position statements regarding technology. The Computer Education Position Statement, the Position Statement on Use of Internet Resources to Enhance Mathematics Instruction and the Position Statement on the Instructional Use of Technology in Mathematics were each approved by delegate assemblies to address different aspects of technology use in mathematics instruction. Over time these position statements have become outdated and difficult to update. The intent of this position statement is to combine and update the content of these statements by utilizing a new perspective. By examining the mathematical behavior we wish to instill in our students, this position statement will make recommendations on how technology can affect these behaviors.
- What is the rationale for the position statement?

This position statement is designed to help faculty evaluate the utility of technology in the classroom. Instead of prescribing a particular type of technology, the position statement defines a list of desired mathematical behaviors and encourages the use of any technology that is documented to enhance these behaviors.
- What change do you hope to effect?

The intent of this position statement is to encourage faculty and institution to document their successes and failures regarding technology use in the mathematics classroom. By documenting technology usage, the larger mathematics community can establish a baseline for growth regarding technology and mathematical behavior.
- Who will implement the recommendations of the position statement?

This position statement reflects the recent scholarship of teaching strand at recent AMATYC conferences, the Crossroads and Beyond Crossroads documents. The TiME Committee in coordination with the AMATYC leadership will lead the effort to implement the recommendations of this position statement at the national and local level.
- Give a summary of the proposed recommendations.

This position statement defines a list of desired mathematical behaviors in students and encourages the use of technology to enhance and assess those behaviors. This use includes documenting the effects of technology and using this documentation to improve instruction. The statement also advocates for professional development regarding technology.

Position Statement of the AMERICAN MATHEMATICAL ASSOCIATION OF TWO-YEAR COLLEGES

The Use of Technology in Mathematics Education

Educators often think of technology as a tool in the classroom. More generally, technologies are any¹ “tools and practices deliberately employed as natural (rather than supernatural) means for attaining clearly identifiable ends.” This definition assumes a goal and a means to determine whether the goal is achieved. Goals and means change so technology evolves in response to these changes. Improvements in technology can lead to changes in what is taught in mathematics. Educators need to understand the nature of technology² and evaluate technologies on a thoughtful basis.

Technology has the potential to enhance the mathematical behavior of students in all types of learning environments and in society. Students exhibiting good mathematical behavior³:

- Interpret problems using different mathematical representations and procedures that accurately reflect key mathematical concepts.
- Devise strategies to solve problems and follow logical processes toward solutions.
- Communicate solution strategies effectively.
- Carry out strategies in an accurate and complete manner.
- Understand the deeper structure of problems and see how the processes used to solve problems relate to other contexts.
- Effectively analyze the appropriateness of solutions.

In addition to enhancing mathematical behavior, technology can also be used to assess the mathematical behavior of students.

AMATYC makes the following recommendations to help faculty evaluate and adopt technologies that enhance and assess the mathematical behavior of students.

Recommendations:

1. Faculty should use the results of academic research on technology to enhance the mathematical behavior of students.
2. Faculty must anticipate and evaluate the effects of technology on mathematical behavior. Some effects may be desirable, some undesirable.
3. Faculty should document how technology improves the mathematical behavior of students and communicate these improvements to other faculty.
4. Faculty and institutions should consider the constraints a technology imposes on the student and faculty before adopting it. These constraints may be ethical, economical, pedagogical, mental or physical.
5. Faculty should continually modify their use of technology based on feedback from past and current use.
6. Institutions should provide professional development opportunities on using technology to enhance teaching and learning, encourage faculty to evaluate the effects of technology on students' mathematical behavior and promote changes in technology use based on objective data.

Rationale:

Technologies are changing rapidly. Instead of focusing on a particular class or type of technology, faculty need to examine what they want their students to do and how technology can help them to accomplish those tasks. Almost any technology currently available in the mathematics classroom can arguably be said to enhance the mathematical behavior of students. Often these arguments are made based on human judgments and not objective data. Scholarship on the desirable and undesirable effects of technology, the constraints imposed by technology, and utilizing the enhancements in mathematical behavior are just as important in mathematics education as advancing the capabilities of technology.

Bibliography:

1. Richter, Maurice N. (1982). *Technology and Social Complexity*. Albany, NY: State University of New York Press.
2. Flick, Lawrence B. and Lederman, Norman G (2003). *Technology: What Does It Mean to You?* School Science & Mathematics; Vol. 103 Issue 7, p313-316.

3. Pugalee, David K (1999). *Constructing a Model of Mathematical Literacy*. The Clearing House, Vol. 73 Issue 1, p19-22.
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