Appendix K: Documents regarding Missouri MAA input regarding the mathematics requirements for Missouri junior high school teachers, 1982-1984.

This appendix contains the following documents:

1. News Release about the May 11, 1982 meeting with Arthur Mallory
2. The nine questions presented to Mallory on May 11, 1982
3. Mallory's response to a letter from Troy Hicks (Hicks' letter to Mallory is not available)
4. Letter to P.J. Newell from Shirley Huffman about the calculus requirement for junior high mathematics teachers
5. Newell's response to Huffman
6. Missouri MAA letter informing Missouri State Board of Education and TECAC of the resolution passed at the 1983 Section Meeting
7. Response from TECAC to the MAA resolution
8. Beginning of Missouri MAA work on a document regarding the 1984 mathematics certification requirements for junior high teachers
9. Memo to Missouri department chairs and faculty on the 1984 guidelines
10. The official Missouri MAA response to TECAC on the 1984 Math 7-9 certification requirements

For more information contact: Dr. Shirley Huffman, SMSU
836-5943 (office)
887-3258 (home)

NEWS RELEASE

A group of educators from area colleges and public schools will meet with Commissioner of Education Arthur Mallory at 7:00 AM, Tuesday, May 11, at the Sheraton Inn. The group will request that Commissioner Mallory table a plan which appears to be aimed at certifying a large number of mathematics teachers for grades 7-9 who will not meet either present or 1984 certification requirements.

Under the proposed plan, teachers who attend a 1982 Summer Math Institute will earn 9-12 hours of math credit that guarantees the district a "teacher certified to teach math on the junior high level." Math educators examining the workshop courses described in a letter to school administrators feel these courses are not appropriate nor adequate preparation for junior high teachers.

The following time frame attests to the fact the program is hastily planned. The Missouri State Board of Education approved the plan on April 19, 1982, university people were appraised of the State Department proposal on April 28 and the host institutions were to submit their proposals by May 7. Teachers sponsored by their local districts were asked to send credentials to the State Department by May 7.

Dr. Shirley Huffman, Associate Professor of Mathematics at SMSU, says the group does not oppose a plan to help alleviate the mathematics teacher shortage, but requests the present proposal be tabled so adequate consideration can be given to a course of action that will at least produce teachers that meet the 1984 certification requirements.

Commissioner Mallory, we would appreciate written answers to the following questions:

1. Who was involved in creating the plan adopted by the Missouri Board of Education to certify teachers of mathematics in summer institutes funded by the DESE and the participating school districts?
2. Why wasn't the Teacher Education and Certification Advisory Committee involved in preparing the recommendation to the Board or given information about the plan before Board approval?
3. Were representatives of the Missouri Council of Teachers of Mathematics or the Missouri Section of the Mathematical Association of America involved in preparing the plan?
4. In what ways does the plan for certification vary from NCTM recommendations for certification in mathematics?
5. Why couldn't the plan be designed to be consistent with the 1984 certification requirements?
6. Will teachers participating in the summer institute be competent to teach Algebra I and Geometry, which are currently being taught in many junior high schools?
7. Why weren't guidelines included in the specifications sent to the colleges that would insure the 1984 requirements be met?
8. Why such a short time frame for such an important problem?
9. What are your long range plans for making teaching a profession which will attract and retain the quality people our youth deserve?

Please send the answers to Dr. Shirley Huffman, 4238 Sunrise, Springfield, MO 65807.

MISSOURI STATE BOARD OF EDUCATION

POST OFFICE BOX 480

JEFFERSON CITY, MISSOURI 65102

May 10, 1982

ARTHUR L. MALLORY
COMMISSIONER OF EDUCATION

Dr. Troy L. Hicks
Professor of Mathematics and
Governor of the Missouri Section of the
Mathematical Association of America
University of Missouri-Rolla
Rolla, Missouri 65401

Dear Troy:

Thank you for your helpful letter of May 6. I appreciate having it. Also, I enjoyed our telephone conversation which led to the letter.

I will not attempt now to answer each point raised in your letter except to say that every effort will be made to see that the summer institute or institutes will be quality in nature. I can't believe that a university or college would recommend a shoddy second-rate program for the preparation of math teachers at the junior high level. We, of course, don't want and are not implying such.

You, of course, have been keeping up with the mathematics requirements for teacher certification. Since 1970, the only requirement for a teacher of junior high school math was to have "21 hours". There was no specific list of courses mentioned in the state requirements. This was left up to the local college and university. Now we are trying to find a way to increase the number of people who are making themselves available to teach mathematics at the junior high level. As we make these efforts, suggestions have been regarding a minimal number of courses which should be offered. These suggestions resulted from a survey of numbers of junior high school mathematics teachers as to their perceived needs.

Right now, the suggested minimum for the summer institute will be two 3-hour courses in mathematics to be determined by the math faculty, one 3-hour course in technology which can include metrics, decimals, calculator math, microcomputers, and perhaps something in elementary statistics. One immediately realizes with reference to this particular course that any one of these areas can become a major field of study, but perhaps need not be for a junior high school math teacher. Another 2- or 3-hour institute type course should be provided in methods and/or techniques of teaching junior high school mathematics.

It seems to me that if elementary schoolteachers who have seven to nine hours of mathematics were to take these particular courses for the summer of 1982 and successfuly complete each one, they should be prepared to teach mathematics at the junior high level. In those school districts where some higher mathematics are taught, the administrators will just have to see that teachers appropriately trained to teach such courses are employed.

The question has been raised as to whether or not each person participating in this session will have a permanent certificate to teach mathematics at the high school level. The answer is no. Such people, if they qualify, will be awarded a two-year provisional certificate and are required to return to the college campus in the summer of 1983 to earn additional credit as determined by the institute.

You mentioned in your letter that this is a good idea. Indeed it is. It does help answer a major need in Missouri's public schools. I trust all of us--math educators, administrators, and others--will constructively move forward and improve what is currently a sad situation, and that is, not having enough math teachers properly prepared to teach in Missouri's public schools.

Regards.

Sincerely yours,

Commissioner of Education

rb
cc: Glen Haddock
Kenneth W. Lee
Victor H. Gummersheimer
Jerry Wilkerson
Ed Huffman
Keith Stumpff
Shirley Hill
Don W. Priest
R. V. Wilson

April 12, 1983

P. J. Newell
Department of Elementary and Secondary Education
P. O. Box 480
Jefferson City, Missouri 65102

Dear Mr. Newell:

I am writing to oppose a proposed change in the certification requirements for junior high mathematics teachers. I understand it has been proposed to allow a three-hour calculus course to satisfy the calculus requirement. I teach mathematics at Southwest Missouri State University; however, the views expressed are mine. I wish to emphasize this since the Mathematics Department at SMSU as a whole has not been made aware of, nor discussed, the proposed change. I became aware of the proposal from a friend outside our department.

I taught junior high mathematics for five years prior to becoming a college teacher. I presently teach both our five-hour calculus course and our three-hour course on a regular basis. While it is true that a junior high teacher will not teach the specific content of a calculus course, there are many ways the teacher benefits from having taken calculus.

The three-hour calculus course will enhance the junior high teacher's algebra and arithmetic skills. The five-hour calculus course will do a much better job of enhancing these skills and, in addition, help develop the ability to read mathematics. Learning to read mathematics is essential to becoming good at problem solving and to seeing the structure and beauty of mathematics. Many mathematics teachers put inadequate emphasis on word problems because they feel unsure of themselves in solving these problems. In the five-hour course we also consider more problems which involve basic ideas from geometry and trigonometry. Many of these ideas the junior high teacher will be teaching. In the junior high classroom, there are so many distractions that the teacher needs to be extremely confident and competent in subject matter.

Another great concern of mine is that the three-hour calculus course is terminal in nature. There are only two courses listed in our catalog which count toward a major or minor in mathematics and do not have the five-hour calculus as a prerequisite.

I understand part of the proposed change would be to require a computer course to fill in for the two-hour reduction in calculus. I recognize the need for all teachers (not just mathematics teachers) to become more aware of computers; however, computer science should not be considered a substitute for mathematical knowledge and skills.

I do recognize the severe shortage of mathematics teachers. However, in meeting the minimal qualifications for certification, we should not encourage teachers to make it difficult to improve their qualifications. A great deal of thought was given to the 1984 certification requirements. Let's give them a chance to work.

Sincerely yours,

Dr. Shirley Huffman
Associate Professor of Mathematics

cc: Arthur L. Mallory
Joan Collins

P.J. NEWELL, JR.
Assistant Commissioner

DIVISION OF
INSTRUCTION

DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION

STATE OF MISSOURI
Jefferson City 65102

April 18, 1983

Dr. Shirley Huffman
Associate Professor of Mathematics
Department of Mathematics
Southwest Missouri State University
Springfield, Missouri 65804

Dear Dr. Huffman:

On April 12, 1983, you wrote to me and Commissioner Mallory expressing your concern about a proposed change in the certification requirements for junior high mathematics teachers. I am pleased to reply on behalf of the Commissioner and myself.

Dr. L. T. Shiflett, Head of the Department of Mathematics, Southwest Missouri State University, wrote to Commissioner Mallory on November 16, 1982, suggesting that the grades 7-9 mathematics certification requirements might be appropriately met by a 3-hour calculus course. He suggested that if the requirement read "calculus 3-5 hours," we would be able to set up a program of certification within the reach of far more prospective teachers. He further stated, "we firmly believe that the 5-hour requirement necessitating the usual Calculus I course would be pretty devastating to many such prospects."

At the February 7, 1983, meeting of the Teacher Education and Certification Advisory Committee (TECAC), it was suggested that the new standards be altered as shown on the attached sheet. TECAC asked Mr. R. V. Wilson, Director of Teacher Education and Certification, to contact some of the mathematics organizations for their comments for changing the 7-9 mathematics requirements. It is my understanding this will be further discussed at the April 25, 1983, meeting of TECAC.

By copy of this letter, I am making Mr. R. V. Wilson aware of your concern so he can bring this to the attention of TECAC at its April 25, 1983, meeting.

Sincerely yours,

P. J. Newell, Jr.

P. J. Newell, Jr.

cc: Commissioner Mallory
R. V. Wilson
Joan Collins

Enclosure

MATHEMATICS

	Grades 7-12 Semester Hours	Grades 7-9 Semester hours
Calculus and Analytical Geometry	8-10	X 3-5
Algebraic Structures	3-5	3
Geometry	3-5	3
Computer Science	1-3	X 1-3
Sub-total	20	12

With additional hours from at least 3 of the following areas:

History of Mathematics	2-3	2-3
Structure of the Real Number System	2-3	2-3
Number Theory	2-3	2-3
Completion of Calculus Sequence	2-5	2-5
Geometry for Secondary Teachers	2-3	2-3
Algebra for Secondary Teachers	2-3	2-3
Probability and Statistics	2-3	2-3
Computer Science	2-3	2-3
Math for Exceptional Child	2-3	2-3
Linear Algebra	2-3	2-3
Sub-total	10	9
Grand Total	30	21

MISSOURI WESTERN STATE COLLEGE

4525 DOWNS DRIVE
SAINT JOSEPH, MISSOURI 64507
(816) 233-7192

April 23, 1983

Missouri State Board of Education and TECAC
P.O. Box 480
Jefferson City, MO 65102

At its annual spring meeting held this year on the campus of Missouri Western State College April 22-23, the Missouri section of the Mathematical Association of America passed the following resolution.

Resolved: The Missouri section of the Mathematical Association of America respectfully requests the Teacher Education and Certification Advisory Committee delay action on a proposal to change the 1984 certification requirements for junior high mathematics teachers from a five hour calculus course to a three hour calculus course. The MAA requests that the exact content of this proposal be forwarded to the MAA through the section secretary in order for the association to study the implications of the proposal and respond to TECAC.

Be it further resolved: The MAA requests the State Department of Education inform the MAA, MCTM, MATS and other math organizations of proposals which would affect mathematics education in the state of Missouri. Notification of these organizations should be in a manner which would allow time for adequate study and response by the organizations.

The MAA requested that a letter containing this resolution be given to Joan Collins for conveyance to the April 25 meeting of TECAC and that copies of the letter be sent to Commissioner Mallory, Assistant Commissioner Newell, and R.V. Wilson.

Respectfully submitted,

Jerry Wilkerson

Jerry Wilkerson
Secretary-Treasurer, MAA

cc: Commissioner Mallory
Assistant Commissioner Newell
R.V. Wilson
Joan Collins

ARTHUR L. MALLORY
Commissioner

Area Code 314
751-3486

State of Missouri
DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION
P.O. BOX 480
JEFFERSON CITY, MISSOURI 65102

May 10, 1983

Dr. David Bahnemann
Secretary-Treasurer of MAA
Northwest Missouri State University
Maryville, Missouri 64468

Dear Dr. Bahnemann:

Dr. L. T. Shiflett, Chairman of Southwest Missouri State University Mathematics Department and Director of the Springfield Summer Math Institute, appeared before the Teacher Education and Certification Advisory Committee at its April 25th meeting and supported his request that we reconsider the 1984 guidelines for the preparation of math teachers, grades 7-9. This reconsideration, which was first presented at our February 7th meeting, changes the five hour calculus requirement to a 3-5 hour requirement, with the two hours being added to the one hour computer science class, if the student chooses. Our committee decided this change was too significant to be made without consulting Missouri math organizations, so we requested additional information be presented from them at the April 25th meeting. In his presentation supporting the requested change, Dr. Shiflett supported the 1984 upgrading of requirements, but stated that as he had tried to work with them in the math institute he had realized that having to follow these requirements would be "totally impossible."

Also appearing at the April 25th meeting, representing the views of MAT^2 and NCTM, was Dr. Ken Stilwell, Northeast Missouri State University Mathematics Department and Director of the Kirksville Summer Math Institute. Dr. Stilwell reported that during discussions at a NCTM Executive Committee meeting many members opposed any lessening of requirements, that several proposals were discussed, with no proposal winning majority support. The proposed change was also discussed at the MAT^2 meeting in Columbia April 9th with no strong feelings for or against and no position being taken. Dr. Stilwell summarized by saying that while many members would be unhappy, there would probably be no strong opposition to the proposed change.

During discussion, Dr. Mike Awad, Southwest Missouri State University Mathematics Department, supported Dr. Shiflett's request, pointing out that the proposed changes in Missouri 1984 requirements would be in line with changes being considered by the NCTM on the national level. (Dr. Shiflett had presented this information in his presentation earlier.)

The Missouri Section of the Mathematical Association of America had directed Joan Collins to present a resolution adopted at their April 23rd meeting in St. Joseph. This resolution requested that the TECAC Committee delay action on the proposed change until their association had sufficient time to consider the proposal and respond to TECAC. In addition, the resolution asked that other Missouri math organizations be notified "in a manner that would allow time for adequate study and response."

After considering all of this information, TECAC realized more information was needed before deciding this issue. Consequently, a subcommittee was formed to study the proposal and report back to the September 26th meeting of TECAC. In a brief meeting of the subcommittee following TECAC adjournment, the members decided to officially contact MAA, MAT^2, and NCTM with this information and request that, if you have information or concerns regarding this matter, to please send this to us in time for our July 16th meeting. We plan to study all the information we gather and have a recommendation for the September TECAC meeting, as 1984 is close at hand. We realize the difficulties imposed by the short time line and the communication limitations of a state organization, but we assure you we will do everything possible to base our decision on the expert advice we obtain from the official representatives of the math organizations of Missouri. If possible, send your information directly to all four subcommittee members listed below to avoid any delay. If not, either R. V. Wilson, Department of Elementary and Secondary Education, or Joan Collins will send copies to them as quickly as possible.

Thank you for your help in this matter.

Sincerely yours,

TECAC Subcommittee for Math 7-9
Certification Requirements

Joan Collins, Chair
Route # 1, Box 37
Willard, Missouri 65781

Bill Brent
Route # 6, Box 259
Rolla, Missouri 65401

Ralph Ford
3124 Kage Road
Cape Girardeau, Missouri 63701

Mary Ellen Finch
7516 Teasdale Avenue
St. Louis, Missouri 63130

ta

Copy: Dr. Hal Laydon, TECAC Chairman
Commissioner Arthur Mallory
R. V. Wilson

MISSOURI WESTERN STATE COLLEGE

4525 DOWNS DRIVE
SAINT JOSEPH, MISSOURI 64507
(816) ~~233-7192~~ 271-4370

279-0156
Williams

call after July 1

May 23, 1983

TO: Members of the M.A.A.-MO Section Executive Committee

Enclosed is a copy of a letter I received concerning the Certification requirements for the preparation of mathematics teachers for grades 7-9. The time for reply is very short and highly inconvenient for faculty, but our input is vital.

I would suggest that the Section prepare a written document emphasizing the need to retain the 5 hours of calculus in the requirements. Due to the time factor, we could probably not obtain a document endorsed by the general membership of the section; however if the Executive Committee, or a special appointed committee, could prepare a document endorsed by the Executive Committee, and this document be distributed to the general membership with the statement attached that opposing (or supporting) views be sent directly to the TECAC subcommittee for Math 7-9, then I think the membership should not have a basis for objection to the procedure.

Let's get on the "tie-lines" and discuss the manner in which our input can be effective and representative of the Section.

Sincerely,

Dr. Ken Lee

wg

cc: Troy Hicks

Enclosure: Letter

MISSOURI SECTION

of

THE MATHEMATICAL ASSOCIATION of AMERICA

DATE: July 8, 1983

TO: Mathematics Department Chairperson and Faculty

FROM: M.A.A.-Mo. Section Executive Committee

SUBJ: 1984 guidelines for the preparation of mathematics teachers, grades 7-9.

The 1984 guidelines include Calculus and Analytical Geometry (5 semester hours), Algebraic structures (3), Geometry (3), Computer Science (1) and additional hours in mathematics (9) for a total of 21 semester hours. At its February meeting the Teachers Education and Certification Advisory Committee (TECAC) was asked to reconsider the 1984 guidelines. The proposal would change the five hour calculus requirement to a 3-5 hour requirement. If the student chooses 3 hours of calculus, the two hours would be added to the one hour computer science requirement. At its April meeting the TECAC formed a subcommittee to study the proposal and report back to the September 26 meeting of the TECAC.

As part of its information gathering process, the subcommittee has asked various mathematics organizations to share any information and concerns regarding the proposed changes by July 16. The letter which we have prepared in behalf of the Missouri Section of the Mathematical Association of America is enclosed.

So that our members will have an opportunity to express their opinion on this matter, we request that you circulate this letter in your department and encourage your faculty to state their position to the TECAC subcommittee. The names and addresses of the subcommittee members are

Joan Collins, Chair, Route #1, Box 37, Willard, Missouri 65781
Bill Brent, Route #6, Box 259, Rolla, Missouri 65401
Ralph Ford, 3124 Kage Road, Cape Girardeau, Missouri 63701
Mary Ellen Finch, 7516 Teasdale Avenue, St. Louis, Mo. 63130

MISSOURI SECTION

of

THE MATHEMATICAL ASSOCIATION of AMERICA

June 27, 1983

TECAC Subcommittee for Math 7-9
Certification Requirements

Dear Members:

The Missouri Section of the Mathematical Association of America (MAA) wishes to thank you for this opportunity to comment on the proposed changes in teacher certification. Our interest in these matters is long standing and on going. We would also like to compliment TECAC for its handling of this important matter. Input from various groups, along with ample time for discussion and reflection on the consequences of changes, is important.

You are all probably aware of the recent report of the National Commission on Excellence in Education that was submitted to President Reagan. It calls for colleges and universities to raise their admissions standards to help turn back a "rising tide of mediocrity". Also, they suggest tougher requirements for high-school graduation, higher salaries for teachers, and new incentives to attract talented students into teaching. The report also recommends that high schools require all students to take four years of English, three years of mathematics, science, and social studies, and a half year of computer science. It seems clear to us, that better qualified mathematics teachers in grades 7-12 will be required.

It is our position that a mathematics teacher in grades 7-9 should be familiar with the mathematics courses taught in grades 10-12 and that this implies that 5 semester hours of calculus and 2 semester hours of computer science should be required. In the colleges and universities which do not offer a 1-semester hour computer science course, the current requirement (5 hours of calculus and 1 hour of computer science) means that their students will take a 2 or 3-semester hour course. Thus, in these institutions the effect of the proposed change (3-5 hours of calculus and 1-3 hours in computer science) will be a reduction in the requirement rather than an optional shift of hours from mathematics to computer science.

If the colleges and high schools implement the recommendations of the National Commission, the usual Calculus I course will be the first course many, and probably most, college students take. Presently, many students are taking the equivalent of this course in high school. Surely we want our teachers of mathematics to have at least this much calculus. Dr. Newell, in his reply to Dr. Huffman, quoted from a letter giving justification for the proposed change: "We firmly believe that the 5-hour requirement necessitating the usual Calculus I course would be pretty devastating to many such prospects." If this is true, surely we do not want to certify such a person. It scares us to think what an informed newspaper editor could do with this statement.

In her letter of April 12, 1983, Dr. Shirley Huffman gives several specific reasons for retaining the 5-semester hour calculus requirement. We find her arguments to be valid and persuasive. Please permit us to quote the second through the fourth paragraph.

I taught junior high mathematics for five years prior to becoming a college teacher. I presently teach both our five-hour calculus course and our three-hour course on a regular basis. While it is true that a junior high teacher will not teach the specific content of a calculus course, there are many ways the teacher benefits from having taken calculus.

The three-hour calculus course will enhance the junior high teacher's algebra and arithmetic skills. The five-hour calculus course will do a much better job of enhancing these skills and, in addition, help develop the ability to read mathematics. Learning to read mathematics is essential to becoming good at problem solving and to seeing the structure and beauty of mathematics. Many mathematics teachers put inadequate emphasis on word problems because they feel unsure of themselves in solving these problems. In the five-hour course we also consider more problems which involve basic ideas from geometry and trigonometry. Many of these ideas the junior high teacher will be teaching. In the junior high classroom, there are so many distractions that the teacher needs to be extremely confident and competent in subject matter.

Another great concern of mine is that the three-hour calculus course is terminal in nature. There are only two courses listed in our catalog which count toward a major or minor in mathematics and do not have the five-hour calculus as a prerequisite.

In many schools the 3-hour calculus course does not have trigonometry as a prerequisite as does the 5-hour course. This could mean some teachers would be certified without ever having taken trigonometry. Although the 1982 NCTM suggested minimal requirements list a 3-hour calculus course, this must be considered only in the context of the remainder of their guidelines. They first assume the student has taken 4-years of mathematics in high school <u>including</u> trigonometry. They also recommend that the student take a mathematics course which emphasizes applications of mathematics in science, engineering, business and related areas. Since many colleges do not offer an applied mathematics course except at the Jr.-Sr. level, probably the best substitute would be the 5-hr calculus course.

We do not think this is the time for changes in certification since there are two factors which may bring significant changes in the field of teaching mathematics:

1. The increased requirements for college entrance.

2. The great amount of publicity on the shortage of mathematics teachers. Some people that are not truly interested in mathematics may try for minimal certification just for job security. We should not lower standards, but rather be sure that such teachers are truly qualified. Lowering standards for certification is demoralizing to presently qualified teachers in the field. Qualified senior high mathematics teachers are often frustrated when trying to teach students who have had jr. high teachers with weak backgrounds. Lowering certification requirements gives the impression to qualified teachers that the state would rather lower standards than help make the public aware of the real need to raise salaries.

It is highly probably that the U.S. Congress will soon make money available for training and retraining mathematics teachers for grades 7-12. In light of the recommendations of the National Commission, it seems clear that states with weak teacher certification requirements will receive little of the money unless they

upgrade their requirements. If we keep or improve our certification requirements, the MAA believes that the opportunity exists to make some very positive long term gains while solving the current problems. This is especially true if the state follows the lead of several other states and makes a significant amount of money available.

In conclusion, the MAA supports the retention of the 5-semester hour calculus requirement and suggests that TECAC study the possibility of raising the computer science requirements to 2-semester hours for certification of teachers of mathematics for grades 7-12.

Sincerely yours,

Executive Committee of the
Missouri Section of MAA

Victor Gummersheimer, President

Ken Lee, Past President

Edward Davenport, Vice President

Keith Stumpff, Section Governor

David Bahnemann, Sec.-Treasurer

Ed Huffman, Newsletter Editor

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