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Information

Professional Services Committee

Plan to Address Issues Related to Authorizations to Teach Mathematics

Executive Summary: This agenda item continues the discussion related to authorizations to teach mathematics begun at the October 2008 Commission meeting. It presents a plan for addressing issues related to authorizations to teach mathematics that were raised in October agenda item.

Recommended Action: For information only

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Strategic Plan Goal: 1

Promote educational excellence through the preparation and certification of professional educators

- ◆ Sustain high quality standards for the preparation and performance of professional educators and for the accreditation of credential programs

November 2008

Plan to Address Issues Related to Authorizations Teach Mathematics

Introduction

At the October 2008 Commission meeting, staff presented an agenda item that initiated a discussion about current authorizations to teach mathematics, including how these authorizations were related to the achievement of K-12 students in mathematics. The discussion was framed by a series of questions posed within the agenda item. At the conclusion of the discussion, Commissioners directed staff to return with further information for review and discussion relating to these questions. This agenda item reorganizes the discussion questions into four major topics and presents a plan for bringing back each topic over a period of several months for further Commission review and possible future action.

Background Information

The background information provided in the October 2008 agenda item covered several topics related not only to current authorizations to teach mathematics, but also to the preparation of teachers for each of these authorizations. These topics included:

- Trends in student enrollment in K-12 mathematics courses
- Number of K-12 mathematics courses in California, the number of FTE staff who teach these courses, and the type of authorization required for these course instructors
- K-12 student proficiency levels in mathematics
- Overview of authorizations that allow an individual to teach mathematics
- Number of mathematics credentials and other mathematics authorizations awarded from 2002 through 2007
- Number of students completing mathematics majors in California's postsecondary institutions
- Subject matter preparation to teach mathematics, including the number and passing rate of candidates who satisfy the subject matter requirement through the examination route (CSET:MS and CSET: Single Subject Mathematics)
- Pedagogical preparation to teach mathematics

In addition to the background information, staff posed a series of discussion questions that focused on several major themes relating to preparation and authorizations for mathematics. These major themes can be summarized in the following manner:

- How do current preparation and authorizations for multiple subject teachers as well as for single subject Mathematics teachers relate to teaching of mathematics in general, and to Algebra I in particular?
- How do the single subject preparation program standards address the methodology of teaching mathematics, and do these standards need revision?

- What is the fidelity between the preparation standards and the actual program delivery services provided to candidates?
- What are the outcomes of the examination routes to establishing subject matter competency in mathematics for multiple and for single subject candidates? Does the content and /or organization of the current CSET: Multiple Subjects Mathematics and Science subtest need review and/or revision? Could using the CSET: Foundational Mathematics examination play a role with respect to multiple subject teachers who are assigned to teach Algebra I?
- Is there a role, and if so what is that role, for holders of the currently underutilized Mathematics Specialist credential?

Plan and Schedule to Address Identified Discussion Topics

After review and discussion of the range of topics, issues, and questions described above, the Commissioners requested that staff further organize these topics and their related questions, and provide more in-depth information for review and possible future Commission action. Staff has reorganized the range of discussion questions into four general discussion issues. Each issue will form the basis for a future agenda item at regularly-scheduled Commission meetings over the next several months, as described in the operational plan below.

December 2008 Meeting: Organization and Structure of Subject Matter Preparation and Authorizations for Teaching Mathematics

Key Issue: What content should teachers of mathematics know and what is the optimum credential authorization structure for K-8 teachers of mathematics?

This agenda item will provide more in-depth information about the following types of issues:

- Does the subject matter preparation of multiple subject teachers include adequate subject matter preparation to allow the teachers to be successful with students at the full range of the K-8 credential authorization?
- Does the current authorization structure meet the needs for elementary teachers of mathematics and the range of their potential assignments, including Algebra I?
- Should a Supplementary Authorization in Mathematics authorize an individual to teach Algebra I or any classes having Algebra I as a prerequisite?

January 2009 Meeting: Determining Subject Matter Competency

Key Issue: How do we know that teachers of mathematics at all levels have sufficient content knowledge?

This agenda item will provide more in-depth information about the following types of issues:

- Do the subject matter requirements for mathematics for multiple subject teachers and for single subject teachers adequately address mathematics content? How do these subject matter requirements relate to the credential structure?
- Does the current CSET: Multiple Subjects examination sufficiently assess a prospective multiple subject teacher's knowledge of mathematics content?
- What are the passing rates on the CSET: Multiple Subjects examination with respect to math content? What are the passing rates on the CSET: Foundational Level Mathematics examination?

- Is the content of the current CSET: Foundational Level Mathematics more appropriate to assess a prospective K-8 teacher's knowledge of mathematics content if that teacher is expected to teach Algebra I in the 8th grade?
- Should the current CSET: Multiple Subjects examination contain a separate subtest for Math and a separate subtest for Science rather than a single subtest that includes both subject areas?

March 2009 Meeting: Pedagogical Preparation for Teaching Mathematics

Key Issue: How do we know that teachers of mathematics know how to teach math appropriately to all students?

This agenda item will provide more in-depth information about the following types of issues:

- Does the teacher preparation program for multiple subject teachers include adequate pedagogical preparation for the successful teaching of mathematics in all of grades K-8, including the teaching of Algebra I?
- Do the adopted single subject preliminary preparation program standards adequately address the methodology of teaching mathematics, especially remediating students' misunderstandings or filling in the holes in the students' conceptual understanding of mathematics?
- Do the adopted single subject preliminary preparation program standards adequately address the methodology of teaching mathematics? If the standards do adequately address the teaching of mathematics, are the approved preparation programs offering courses of study and field work that meet the adopted standards?
- Should the pedagogy statements in the adopted preliminary program standards be reviewed and possibly revised based on the more recent mathematics framework?

This agenda item will also report on a stakeholder review of the teacher preparation program standards addressing subject specific pedagogy (8A and 8B) and their alignment with the Mathematics Framework (2006).

Staff also notes that the issue of fidelity of teacher preparation program implementation in alignment with the program standards will be examined within the accreditation process. As the site visits take place in spring 2009, staff will pull together information related to single subject teacher preparation in the area of subject specific methodology. In addition, staff has also begun to collect information from single subject teacher preparation programs on how the approved program addresses single subject pedagogy in both coursework and field work. As staff analyzes the information collected through the single subject pedagogy survey, the Commission plans to facilitate technical assistance for programs to share effective practices related to subject-specific methodology.

Staff also suggests that another venue for addressing the topic of subject-specific pedagogy could be a conference convened by the CTC focusing on "Subject-Specific Methodology and Effective Subject Matter Instructional Practices." Staff will explore the possibility, feasibility, and value of sponsoring a conference of this type.

April 2009 Meeting: The Mathematics Specialist Credential

Key Issue: What purpose does and/or could the Mathematics Specialist Credential serve?

This agenda item will provide more in-depth information about the following type of issues:

- What the current Mathematics Specialist Credential program requires and authorizes and why is the Mathematics Specialist credential currently being underutilized?
- Could the underutilized Mathematics Specialist credential help serve an important role, somewhat similar to a Reading Specialist, in the public schools?

This agenda item will also report on stakeholder feedback regarding the usefulness of the mathematics specialist credential.