2B

Action

Educator Preparation Committee

Work Relating to the Next Generation Science Standards

Executive Summary: This agenda item describes ongoing work to update the Science Subject Matter Requirements (SMRs) to align with the Next Generation Science Standards.

Policy Question: Does the Commission wish to authorize the Executive Director to extend the current contract in order to complete the work of aligning the Science Subject Matter Requirements fully with the Next Generation Science Standards?

Recommended Action: That the Commission authorize the Executive Director to extend the current contract in order to complete the work of aligning the Science Subject Matter Requirements fully with the Next Generation Science Standards.

Presenter: Phyllis Jacobson, Administrator, Professional Services Division

Strategic Plan Goal

II. Program Quality and Accountability

a) Develop and maintain rigorous, meaningful, and relevant standards that drive program quality and effectiveness for the preparation of the education workforce and are responsive to the needs of California's diverse student population.

Work Relating to the Next Generation Science Standards

Introduction
This agenda item describes ongoing work to update the Science Subject Matter Requirements (SMRs) to align with the Next Generation Science Standards (NGSS) and presents a staff recommendation concerning funding to complete the work of fully aligning the Science SMRs with the Next Generation Science Standards.

Background
Education Code Section 44288 requires the Commission to create subject matter advisory panels to advise in the development of subject matter examinations. The subject matter advisory panels must consist of recognized experts in the subject matter field(s) who must be primarily classroom teachers and full-time college or university teachers. Statute requires the purpose of the subject matter examination to be used solely to measure objective knowledge of the particular subject matter (EC Section 44291).

The Commission previously directed staff to proceed with modifications to the Science Subject Matter Requirements in order to align with the Next Generation Science Standards (http://www.ctc.ca.gov/commission/agendas/2014-04/2014-04-4F.pdf). Consistent with both statute and Commission direction, staff worked with the testing contractor to advertise for and select content expert advisory panels in the area of Science (including Multiple Subject Science, Biology/Life Science, Chemistry, Physics, and Earth and Planetary Science). These subject matter content expert advisory panels conducted their initial meetings during August, 2015.

As a result of these meetings, the expert panels are recommending to the Commission that a more extensive update of the Science Subject Matter Requirements and of the corresponding CSET: Science examinations and subject matter preparation program standards be made than had originally been planned. These recommendations are based in large part on the unique nature of the Next Generation Science Standards in comparison to all other previous curriculum standards, including the Common Core State Standards.

Further Discussion of the Next Generation Science Standards
A key concept embedded in this discussion is that *the NGSS provides student performance expectations, not a specific curriculum.* This factor distinguishes the NGSS from all prior standards to a degree that requires a more significant degree of modification in aligning subject matter requirements to the NGSS since there is not a specific defined curriculum to be followed.

As stated in the April 2014 Commission agenda item, "The NGSS for California are significantly different than the California Science Standards adopted by the SBE in 1998. The NGSS focus on a deeper conceptual understanding of science as well as application of the content rather than an emphasis on the knowledge of discrete science facts. The NGSS for California also emphasize:

- learning progressions that develop from kindergarten through grade twelve;
- integration of skills and practices across content areas as the foundation of STEM (Science, Technology, Engineering, and Mathematics) education; and
- integration of both science and engineering practices within the content.

The NGSS describe in detail the key scientific ideas and practices that all students should learn prior to their graduation from high school. The NGSS provides student performance expectations, not a specific curriculum. The NGSS are aligned with the CCSS in English Language Arts and Mathematics. The NGSS Appendices A-M were also adopted in order to assist teachers with the implementation of these new standards and to inform the development of a new science curriculum framework for California."

Need to Expand Scope of NGSS-Related Work

At the time the contract for this work was developed, the Commission's prior experience in updating subject matter requirements had been consistent in that clear new subject matter concepts were available in a familiar organizational framework to which the existing subject matter requirements needed to be aligned, including the Common Core State Standards. At that time, more than a year and a half ago, it was not clear that the NGSS would be so significantly different in conceptualization that they would require a whole new approach to the work of alignment. Also at that time, the California Department of Education had not yet developed and adopted a complete Science framework to serve as a basis for estimating the scope and cost of updating and aligning the Commission's Science Subject Matter Requirements to the NGSS. Thus, the estimated cost was based on the Commission's prior work to update the subject matter requirements to the Common Core State Standards, in the expectation that the scope of work would be similar. However, this has not turned out to be the case.

Science Subject Matter Content Expert Advisory Panel Recommendations

Given the need described above to do more than readjust existing Science Subject Matter Requirements within the current structure and format of these SMRs, the Science Subject Matter Advisory Panels are recommending to the Commission that a more extensive updating and reformatting is required in the case of the NGSS than originally planned. Given the unique nature of the NGSS, the work of alignment of all of the Commission's Science examinations involves more than readjusting the existing Science Subject Matter Requirements and modifying some of the existing items in the Science item banks. An important understanding about the scope of the NGSS Science-related work is that the array of CSET: Science examinations encompasses 7 different Science fields (Multiple Subject and Single Subject), and 6 different CSET Science-related examinations. This more extensive work as recommended by the Science Subject Matter Advisory Panels would result in the development of a new SMR structure for the Single Subject Science content areas (General Science, Biology, Chemistry, Earth and Planetary Science, and Physics) consistent with the NGSS, along with the development of approximately 800 new or revised constructed response items to fit the NGSS parameters for all Science content areas. Although the Multiple Subject SMR structure would remain the same, new constructed response items would also be developed for this Science content area along with the Single Subject Science content areas.

Implementing the panel's recommendations will assure that the Commission's Science Subject Matter Requirements and Subject Matter Program Standards remain in full alignment with the NGSS, especially since CSET SMRs, examinations, and related program standards must stand the test of time until new content standards are adopted by the state.

If the Commission authorizes the expansion of the scope of work to align the SMRs to the NGSS standards, there are options to pay for the work. The current examinations development and administration contract with the Evaluation Systems group of Pearson could be extended an additional two years, through 2019-20, to incorporate the additional work, or staff could work with the administration to increase the expenditure authority in 2016-17 to pay for the additional work through increasing the current contract's funding. Staff suggests that the contract extension will allow the project to move forward with no interruption, whereas the decision about additional expenditure authority would not be made until the 2016-17 state budget is signed. It is possible under this scenario that the work could be delayed as the state budget process is completed.

Staff Recommendation

Staff recommends that the Commission approve the Executive Director to execute a two year contract extension with the Evaluation Systems group of Pearson to complete the NGSS work.

Next Steps

If the Commission authorizes the expansion of the scope of work to align the SMRs to the NGSS and approves the executive director to execute a two year contract extension with the Evaluation Systems group of Pearson, staff would work with the administration to move the contract process forward. The SMRs for the Single Subject Science content areas would be reformatted to be fully consistent with the NGSS approach, and CSET new constructed response items would be developed and validated for all Science content areas and subtests, as applicable.