

PK-12 Education and Teacher Training

Subcommittee report to Louisiana Senate and House Committee on Education (2018)

The LaSTEM PK-12 Education and Teacher Training (PK-12 Education) Subcommittee used a multi-step process to develop draft SMART Objectives for the LaSTEM Advisory Council. The subcommittee members first identified questions that needed to be answered regarding STEM education for PK-12 teachers and PK-8 students. After Subcommittee members identified questions, the questions were shared with the full LaSTEM Advisory Council on November 28, 2017, and council members were asked to identify additional questions and identify potential outcomes for the identified questions. The Subcommittee then divided the questions into three groups and formed the following subgroups to have deeper discussions about the questions: Subgroup 1: Pipeline of Teachers; Subgroup 2: Integrative and Experiential Learning; and Subgroup 3: Access to High Quality STEM Education. The subgroups then met electronically to draft SMART Objectives that contained the objectives, status of the content of the objective, actions needed to address each SMART Objective, indicators that would demonstrate success, and timelines to implement the SMART Objectives. Once the draft SMART Objectives were developed by each subgroup, all SMART Objectives were shared with all Subcommittee members and the additional input was used to revise the draft SMART Objectives. On January 10, 2018, the Subcommittee shared the 12 draft SMART Objectives they had created for Goal 4, Goal 5, Goal 6, and Goal 7 with the full LaSTEM Advisory Council and requested feedback. Timelines for the SMART Objectives were provided for short and long-term outcomes.

Data were examined by the Subcommittee members, and it was determined that the 2016-17 LDOE Educator Workforce Report indicated that of 18,751 total math classes taught in public school in Louisiana, 1,953 (10%) were being taught by out-of-field teachers and 1,444 (8%) were being taught by uncertified teachers. The same report indicated that of 14,896 total science classes taught in public schools in Louisiana, 1,876 (13%) were taught by out-of-field teachers and 1,051 (7%) were taught by uncertified teachers. While all regions had needs, the greatest needs for mathematics were the northern and central regions and the greatest need for science was the central region of the state. When examining the number of new teachers being prepared through undergraduate and post-baccalaureate programs by university and non-university

providers, it was found that an insufficient number of new mathematics and science teachers were being prepared to meet school and district needs. In some certification areas, very few candidates are pursuing certification in those areas. As an example, only two individuals completed programs for computer science certification in 2014-15 and 0 completed programs in 2015-16. Similar low numbers were found for physics with only three individuals completing programs in 2014-15 and 1 completing a program in 2015-16. These numbers reflect the number of individuals completing programs, but they do not indicate if a person actually taught in Louisiana. Candidates in many secondary undergraduate programs in Louisiana now obtain their degrees in a content area (e.g., Chemistry, Physics, etc.) in a College of Science with a minor in secondary education. Thus, they can pursue many different types of jobs in addition to teaching when they graduate. It was the conclusion of the Subcommittee that a variety of incentives for new and existing teachers need to exist to have a sufficient number of certified teachers to teach STEM classes in Louisiana's public schools.

The Subcommittee also determined that the Louisiana Department of Education is currently working with other states to develop a science curriculum for 6-8 grade students that will be aligned with Louisiana's new science standards. Plans exist to develop a science curriculum for other grade levels once the grades 6-8 curriculum is piloted and implemented. Districts may choose to use the Louisiana science curriculum or a different curriculum that meets their needs in the future. It was the conclusion of the Subcommittee that needs exist for PK-12 students, pre-service teachers, and in-service teachers to have access to materials, resources, professional development and support to effectively integrate STEM-oriented integrative and experiential learning activities into schools in Louisiana. A need also exists to demystify STEM education.

Thus, 12 SMART Objectives have been developed by the Subcommittee for further discussions by the LASTEM Advisory Council that address the following:

1. Reducing the percentage of math and science classes statewide in public schools being taught by teachers who are not certified in the areas in which they are teaching.

2. Offering incentives to increase the number of individuals who complete teacher preparation programs and teach computer science and physics in Louisiana schools.
3. Recommending to the LDOE/BESE needed policy changes pertaining to mathematics and science areas of initial and add-on teacher certifications.
4. Building and field testing an open source curriculum that contains integrative and experiential learning activities for grades 6-8 students that will be aligned to Louisiana's science standards.
5. Developing a website with unique Louisiana phenomenon aligned to the Louisiana science standards.
6. Creating and publishing a STEM Guidebook which will provide Louisiana educators information regarding STEM education.
7. Implementing strategies that can be replicated in regions across the state to demystify the STEM field for PK-8 students and their teachers.
8. Providing initial and ongoing professional development to teachers, teacher leaders, educational leaders, and other educators who use the science curriculum developed by educators from Louisiana and other states.
9. Providing science teachers with the materials required to successfully implement integrative and experiential learning activities within the science curriculum adopted by local school districts.
10. Identifying and training Science Teacher Leaders to lead and support peers in schools in Louisiana.
11. Identifying and supporting STEM focused competitions (e.g., robotics) that involve professional development for teachers and experiential learning for students.
12. Adapting teacher preparation curriculums to address integrative and experiential learning within the new grades 6-8 science curriculum developed for Louisiana.

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