

Appendix F: STEM Survey

School Survey on STEM Education

Introduction

In 2013, the Nevada legislature passed SB 345, which established the Advisory Council on Science, Technology, Engineering, and Mathematics (STEM). One of the charges of the STEM Advisory Council is to "conduct a survey of education programs relating to the fields of science, technology, engineering, and mathematics in this State and other states to identify recommendations for the implementation of such programs by public schools in this State and report the information to the State Board of Education."

At this time, the Nevada STEM Advisory Council would like your input on STEM education in your school. The Advisory Council will use the information collected from this survey to assess and describe current efforts in STEM education. Summary data and analysis will be shared with each state's Department of Education.

Please note that the survey is completely anonymous. The survey will take approximately fifteen minutes. Before taking this survey, please read the following definition of STEM education, as approved by the Nevada STEM Advisory Council so that all answers you provide are based on this particular definition.

STEM Education Definition, as approved by the Nevada Department of Education

STEM (Science, Technology, Engineering, and Mathematics) education focuses on active teaching and learning, centered on relevant experiences, problem-solving, and critical thinking processes. STEM education emphasizes the natural interconnectedness of science, technology, engineering, and mathematics, and their connection to other disciplines, to produce informed citizens that possess and apply the necessary understandings to expand Nevada's STEM-capable workforce in order to compete in a global society.

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*** 1. What is your professional role in education?**

- Administrator
 Teacher
 Other (please specify)

*** 2. Please indicate the current grade-level focus of your school.**

- Elementary School
 Middle School
 High School
 Other (please specify)

*** 3. What is your subject area/grade level specialty?**

*** 4. Where is your school located?**

- Large Urban District
 Small Urban District
 Large Suburban District
 Small Suburban District
 Rural District/School
 Tribal District
 Other (please specify)

*** 5. In which state is your school located?**

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***6. How long have you been an education professional?**

- Less than one year
- One to five years
- Six to ten years
- Eleven to twenty years
- More than twenty years

***7. Do you offer STEM education (e.g., programs, courses, or certifications) in your classroom during the school day?**

- Yes
- No
- I do not know
- Not applicable

***8. Does your school offer STEM education (e.g., programs, courses, or certifications) during the school day?**

- Yes
- No
- I do not know
- Not applicable

***9. Has STEM education been integrated as something other than adding additional science and mathematics instruction/courses into your school?**

- Yes
- No
- I do not know
- Not applicable

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*** 1. If STEM education has been integrated as something other than adding additional science and mathematics instruction/courses into your school, how has it been integrated?**

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*** 1. Is the STEM curriculum in your classroom multidisciplinary to include integrated STEM lessons in all content areas (e.g., project-based learning, thematic units, flipped classrooms)?**

- Yes
- No
- I do not know
- Not applicable

*** 2. Is the STEM curriculum in your school multidisciplinary to include integrated STEM lessons in all content areas (e.g., project-based learning, thematic units, flipped classrooms)?**

- Yes
- No
- I do not know
- Not applicable

*** 3. Does your school offer engineering courses or projects during the school day?**

- Yes
- No
- I do not know
- Not applicable

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*** 1. If your school does not offer engineering courses or projects during the day, why or why not?**

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*** 1. If your school does offer engineering courses or projects during the school day, what are these courses or projects (e.g., Engineering is Elementary, Project Lead The Way, etc.)?**

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*** 1. Does your school offer STEM computer –based/computer science activities, classes, or courses (e.g., coding, computer literacy, computer applications, etc.)?**

- Yes
- No
- I do not know
- Not applicable

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*** 1. If your school does not offer STEM computer-based/computer science activities, classes, or courses, why or why not?**

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***1. Is technology used throughout your STEM program as a tool to facilitate research, investigation, and design?**

- Yes
 No
 I do not know
 Not applicable

***2. Are the students in your classroom regularly challenged by complex problems related to real-world scenarios?**

- Yes
 No
 I do not know
 Not applicable

***3. Are the students in your school regularly challenged by complex problems related to real-world scenarios?**

- Yes
 No
 I do not know
 Not applicable

***4. What other STEM activities are offered to all students at your school during the school day (e.g., STEM field trips, science fair, STEM Day, etc.)? Please be as specific as possible:**

***5. Are students in your school regularly involved in STEM competitions (e.g., chess, bridge building, Mathematics Olympiad, Future Cities, Bridge Building, Robotics, Career and Technical Education competitions, Science Olympiad, etc.)?**

- Yes
 No
 I do not know
 Not applicable

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* 1. If students in your school are not regularly involved in STEM competitions, why or why not?

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*** 1. If students in your school are regularly involved in STEM competitions, please list the competitions:**

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*** 1. Are students in your school regularly involved in after-school STEM clubs or activities?**

- Yes
- No
- I do not know
- Not applicable

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*** 1. If your school does not offer clubs, why or why not?**

School Survey on STEM Education

*** 1. If students in your school are involved in after-school STEM activities, please list the after-school STEM clubs or activities:**

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*** 1. What equipment and/or facilities are available at your school to support STEM education? Check all that apply.**

- | | | |
|--|---|---|
| <input type="checkbox"/> Animal Lab | <input type="checkbox"/> Mathematics Lab | <input type="checkbox"/> Space Shuttle Simulator Lab |
| <input type="checkbox"/> Computer Lab | <input type="checkbox"/> Nutritional Center | <input type="checkbox"/> STEM Lab |
| <input type="checkbox"/> Earth/Space Science Lab | <input type="checkbox"/> Observatory | <input type="checkbox"/> Technology Lab |
| <input type="checkbox"/> Engineering Lab | <input type="checkbox"/> Outdoor Learning Lab | <input type="checkbox"/> Wii Lab |
| <input type="checkbox"/> Experiment Stations | <input type="checkbox"/> Physical Science Lab | <input type="checkbox"/> 1 to 1 iPads, iTouch, iPods, tablets |
| <input type="checkbox"/> Exploration Tables or Centers | <input type="checkbox"/> Planetarium | <input type="checkbox"/> Shared iPads, iTouch, iPods, tablets |
| <input type="checkbox"/> Gardens | <input type="checkbox"/> Promethean/Smart/Active Boards | |
| <input type="checkbox"/> Life Science Lab | <input type="checkbox"/> Science Library and Exhibits | |
| <input type="checkbox"/> Other (please specify) | | |
- _____

*** 2. Does your school have a STEM coordinator/specialist?**

- Yes
 No
 I do not know

*** 3. Does your state licensure department offer a STEM endorsement for a teaching license?**

- Yes
 No
 I do not know

*** 4. Do you have a business industry partner(s) involved with STEM education at your school?**

- Yes
 No
 I do not know

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*** 1. If you do not have a business industry partner, have you reached out to any businesses?**

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*** 1. If you do have a business industry partner, who is/are your business industry partner (s)?**

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*** 1. How does your business industry partner(s) participate in STEM education at your school?**

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*** 1. Are professional development opportunities focused on STEM education available for you?**

- Yes
 No
 I do not know
 Not applicable

*** 2. Are there any intrinsic or extrinsic rewards to teaching STEM at your school?**

- Yes
 No
 I do not know
 Not applicable

*** 3. Have you been encouraged to teach STEM at your school?**

- Yes
 No
 I do not know
 Not applicable

*** 4. What are the challenges of integrating STEM education into your school? Choose all that apply.**

- Lack of professional development opportunities
 Lack of physical infrastructure
 Lack of incentive structures
 Lack of funding
 Length of the school day/lack of time
 Administration does not support STEM education
 Other (please specify)

5. Is there anything else that you would like to share or clarify about any of your responses?

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6. If you would be willing to speak to a member of the Nevada STEM Advisory Council to discuss your experience teaching STEM at your school, please provide your contact information.

Appendix G: General Summary of the Nevada Schools STEM Survey Results

In late 2014, the Educational Resources and Strategic Planning Subcommittee of the STEM Advisory Council distributed an anonymous survey to teachers across the 17 school districts in Nevada.

Almost 2,000 individuals responded to the survey. A brief summary of the survey respondents is presented below:

- 81 percent of the respondents were teachers while 12 percent were administrators.
- 50 percent worked in elementary schools, 21 percent worked in middle schools, and 25 percent worked in high schools.
- 50 percent came from large urban school districts, while 20 percent came from rural school districts.
- 85 percent of respondents indicated that they have been teaching for more than 6 years.

Three summary points emerged from the survey results.

STEM Education in Nevada's K-12 system is fairly limited.

- Only 25 percent of respondents indicated they offer STEM education in classroom during the day.
- Only 35 percent of respondents indicated that their school offers STEM education.
- Only 23 percent said that STEM education has been integrated as something other than adding additional science and mathematics instruction/courses into the school coursework/curriculum.
- Only 24 percent indicated that STEM curriculum in the classroom/school was multidisciplinary so as to include integrated STEM lessons in all content areas (e.g., project-based learning, thematic units).
- Only 15 percent of respondents said that their school offered engineering courses or projects during the school day, and only 41 percent indicated that their school offered STEM computer-based/computer science activities, classes, or courses.
- More than half (55 percent) of the respondents said that the students in their school were regularly challenged by complex problems related to real-world scenarios.
- Only 27 percent of the respondents indicated that the students in their school were regularly involved in STEM competitions (e.g., chess, Mathematics Olympiad, Future Cities, Bridge Building).
- Only 20 percent of respondents said students in their school are regularly involved in after-school STEM clubs or activities.
- Only 11 percent of respondents said their school has a STEM coordinator.
- Only 22 percent of respondents said they have been encouraged to teach STEM at their school.

More professional development resources, as well as other resources, are needed to support teaching STEM in schools.

- Around 42 percent of respondents attributed the challenge of integrating STEM education in their school to a lack of professional development opportunities; 62 percent said it was a lack of funding. Roughly 50 percent said the challenge stemmed from inadequate time in the school day, and 46 percent it was a lack of physical infrastructure.
- Only 31 percent of respondents said they had access to STEM education-focused professional development opportunities.
- Only 14 percent of respondents indicated that there were any intrinsic or extrinsic rewards to teaching STEM at their school.
- When asked why their school did not offer engineering or computer-based/computer science activities, respondents said:
 - There was insufficient time in the school day, particularly given other teaching requirements/demands (e.g., Common Core, literacy and math);

- The school lacked sufficient resources (e.g., computers, funding for after-school programs, field trips, etc.);
- Teachers and staff lacked relevant expertise; and
- Few professional development opportunities exist to adequately train/prepare teachers.

Few public-private partnerships exist to support STEM education in the K-12 system.

- Only 7 percent of respondents indicated their school has a STEM business industry partner involved with STEM education at their school.
- Business industry partners tend to participate in STEM education in the following ways: By providing funds for robotics clubs and field trips, and by providing STEM specialists to participate in Career Days and Science Fairs.

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- **A complete copy of the results from the survey can be found at [http://www.doe.nv.gov/Boards Commissions Councils/STEM Advisory Council/2015/January/Support_Materials/](http://www.doe.nv.gov/Boards_Commissions_Councils/STEM_Advisory_Council/2015/January/Support_Materials/) under STEM Survey**