NEVADA'S STEM STRATEGIC PLAN

Please direct thoughts, comments, and feedback to:

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Needs Assessment & Identified Barriers to Improving STEM Education in Nevada

- Student interest in STEM, especially in underrepresented groups, begins to decline late in elementary school.
- Nevada is not producing enough STEM-trained workers to meet the demands of business.
- Teachers lack opportunities and incentives for STEM Professional Development- specific, quality, frequent, aligns with all efforts.
- Many teachers and schools lack funding for STEM-related consumables or equipment necessary to teach STEM- recourses in the schools must be commensurate with expectations.
- With so many curriculum and lesson plans available, it is difficult and time consuming for teachers, schools and districts to determine which resources are quality, aligned to standards.
- There is often a lack of time during the school day to teach STEM, especially with testing and the need to focus on reading and math.
- Ensure NGSS implementation improves STEM education for all students.
- It is necessary that school leadership and district support teaching STEM.
- STEM must be integrated so that it supports other priorities.
- Parental engagement is key and often lacking.
- Legislative mandates take significant time to implement and time away from STEM.
- There is a need to identify leaders and best practices in Nevada to copy.
- Assessment/evaluation.
- STEM education must lead to the skills employers demand.
- There is a need for qualified teachers in STEM subjects.

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This Plan focuses on four direct and underpinning priorities: (1) interest and awareness; (2) quality and scope; (3) equity and access; and, (4) alignment and engagement.

Priority 1: Interest and Awareness

Goal 1: Increase student interest in STEM

Strategies:

- Develop an ongoing, robust STEM marketing campaign targeting students, parents, teachers, business, and other community leaders
  - Who: Office of Science, Innovation and Technology (OSIT), STEM Advisory Council (SAC)
- Develop and increase awareness of STEM career pathways
  - Who: Nevada Department of Education (NDE), Office of Workforce Innovation (OWINN)
- Develop and promote a dedicated STEM website based on STEM/NPWR data as a one-stop integrated resource for students, parents, job seekers and employers
  - Who: OSIT
- Increase STEM outreach to students, parents, and other stakeholders regarding opportunities to learn about STEM and for STEM careers
  - Who: Higher education, K-12, OSIT, NDE
- Develop and administer a survey to measure results
  - OSIT

Goal 2: The creation of a citizenry that recognizes the importance of STEM education in creating a vibrant economy

Strategies:

- Educate stakeholders about the STEM strategic plan
  - Who: OSIT, SAC
- Work with local governments to incorporate STEM into urban and regional agendas
  - Who: OSIT, SAC, higher education, K-12
- Increase corporate philanthropy in STEM to scale evidence-based, effective and coordinated programs
  - Business community

Metrics:

1. Increased number of students participating in high-quality STEM programs P-12
2. Increased number of students taking calculus, physics AP exams
3. Increased number of students enrolling in and completing postsecondary STEM degrees and industry-recognized certificates
4. Increased interest in STEM as reported on the ACT questionnaire
5. Increased interest and awareness of STEM as measured by OSIT survey
6. Website/social media traffic

Priority 2: Quality and Scope

Goal 1: Improve the quality and quantity of STEM education in Nevada schools

Strategies

- Increase the use of hands-on, experiential STEM learning in all grades, with particular emphasis in grades 1-5
    - Who: K-12, NDE, OSIT
- Increase the percentage of elementary schools that teach science three plus hours per week
    - Who: State Board of Education (SBE), K-12
- Increase the percentage of high schools that require three years of science and four years of mathematics
    - Who: SBE, K-12
- Increase the percentage of students who take at least one STEM course in each of the STEM disciplines between grades 7-12
    - Who: SBE, K-12
- Increase the percentage of students taking pre-calculus and calculus in high school
    - Who: SBE, K-12
- Increase the number of internships, job shadowing, and summer research programs, and expand partnerships with local industry
    - Who: NDE, K-12, OSIT, Business, Regional Development Authorities (RDAs)
- Restrict the use of state funds (College and Career Readiness Grants) to evidence-based, proven programs and curriculum
    - Who: SBE, K-12, Legislature, OSIT
- Develop and promote the creativity component in STEM- STEAM
    - Who: SAC, OSIT, Business

Goal 2: Increase the quality and quantity of STEM professional development opportunities for teachers and administrators

Strategies

- Restrict the use of state funds (Great Teaching and Leading Fund) to evidence-based, proven programs and curriculum
    - Who: SBE, K-12, Legislature, OSIT
- Increase the number of teachers receiving STEM recognized professional development and increase the quality of that professional development
    - Who: K-12, Regional Professional Development Programs (RPDP), Higher education, SBE, Legislature, OSIT
- Ensure opportunities for all students to be taught STEM by teachers and administrators that are well-versed in STEM
    - Who: K-12, NDE, SBE, higher education
- Provide greater support to pre-service teachers and administrators studying STEM
    - Who: Higher education, SBE
- Continue *Teach Nevada* funding for students pursuing initial licensure in STEM fields

    - Who: Legislature, SBE
- Expand the *Nevada Teach* program to UNLV
    - Who: Higher education

Goal 3: Identify and scale best practices

Strategies

- Promote STEM Academies and STEM-designated schools
    - Who:
- Increase the number of Governor's STEM Schools each year
    - Who: SAC, OSIT, K-12

Metrics

1. Increased number of students completing postsecondary degrees and/or credentials in STEM disciplines.
2. Increased number of teachers completing initial licensure in STEM fields.
3. Increased number of teachers completing STEM-related, evidenced-based professional development.
4. Teacher effectiveness ratings improve.
5. Increased number of students/classrooms experiencing quality STEM curricula
6. Remediation rate in math declines
7. Increased number of schools with a STEM-specific charter
8. Increased percentage of schools that require 3 years of science/4 years of math, science in elementary school, computer science and engineering, and students taking math and physics in high school.

Priority 3: Equity and Access

Goal 1: Promote equitable opportunity for STEM education across Nevada

Strategies

- Increase the number of informal/after school STEM learning and programs
  - Who: K-12, NDE, Legislature, OSIT
- Increase the opportunities for applied learning, internships and apprenticeships in STEM disciplines
  - Who: K-12, Business, OSIT
- Increase STEM mentorship
  - Who: OSIT, Business, State and Local Government
- Increase dual enrollment programs within STEM disciplines
  - Who: NDE, K-12, Legislature, Governor
- Promote and develop STEM distance education
  - Who: NDE, SBE, Legislature, OSIT
- Provide technical assistance/resources for STEM school development
  - Who: OSIT

Metrics

1. Increased number of underrepresented and female students participating in high-quality high school STEM programs
2. Increased number of underrepresented and female students completing calculus and physics courses, and AP exams
3. Increased number of underrepresented and female students completing postsecondary STEM degrees and/or industry-recognized certificates
4. Increased number of schools with a STEM-specific charter
5. Increased number of schools offering STEM programs

Priority 4: Alignment and Engagement

Goal 1: Align curriculum and programs with the skills required by STEM employers

Strategies

- Promote the delivery and quantity of STEM education that aligns with Nevada's industry and workforce needs
    - Who: OSIT, GOED, OWINN
- Align secondary and postsecondary STEM content and programs with workforce and economic needs
    - Who: NDE, K-12, Higher Education, GOED, OSIT, SBE
- Use NPWR and/or GOED data to identify workforce needs and gaps in the educational pipeline, and allocate resources to effective programs in K-12/higher education that lead to skills in targeted industry sectors
    - Who: OWINN, GOED, NSHE, OSIT
- Invest in programs that provide education and training for targeted occupations
    - Who: Legislature, OSIT, Governor, K-12
- Align STEM degree and certificate attainment with industry needs
    - Who: Higher education, K-12, Governor
- Increase training and educational opportunities at the worksite
    - Business, K-12, Higher education

Goal 2: Increase STEM education, workforce development and economic development coordination and cooperation amongst state and local government, higher and K-12 education, businesses, and other stakeholders

Strategies

- Expand the STEM Coalition's STEM Ambassador program/increase mentorship opportunities
    - STEM Coalition, K-12, Business, OSIT
- Encourage the establishment of university presidents/superintendents' presences in the business community; incentivize faculty to engage in partnerships
    - SAC, OSIT, Business, Higher education
- Encourage the establishment of *educational liaisons* from business to formalize relationships with schools
    - SAC, OSIT, K-12, Business
- Promote local chambers' and regional economic development organizations' engagement by assisting with brokering and maintaining industry-school/university partnerships
    - SAC, OSIT, GOED
- Develop and promote teacher summer externships at New Nevada businesses
    - SBE, NDE, Legislature, Business, K-12, OSIT
- Increase opportunities for internships and apprenticeships
    - K-12, Business, DETR

Goal 3: Promote the effective leveraging of state and federal funding such as funding found in the Every Student Succeed Act (ESSA)

Strategies

- Include STEM as a main component of the state's Every Student Succeed Act (ESSA) plan
    - NDE, Governor

Metrics

1. Increased investment in programs that provide training for occupations that are aligned with the state's economic development plan.
2. Reduction in workforce shortages in targeted occupations.
3. Increase in the number of schools reporting a collaboration with a business.
4. Increase in the number of classroom visits by STEM professionals
5. Increase in the number of STEM field trips
6. Increase in the number of internships/apprenticeships/externships