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Minutes

Name of Organization: Advisory Council on Science, Technology, Engineering and Mathematics (STEM)

Date and Time of Meeting: October 12, 2016, 3:00 PM

Place of Meeting: Nevada State Library and Archives
100 N. Stewart Street, Conference Room C (2nd Floor)
Carson City, NV 89701

This meeting will be video conferenced to the following location:

Grant Sawyer State Office Building
555 East Washington Ave,
Suite 5100
Las Vegas, NV 89101

- I. Call to Order/Roll Call
Mark Newburn, Chair
Kelly Barber, Co-Chair

Chair Newburn called the meeting to order at 3:00pm. He will run the meeting today.

Members Present: Mark Newburn, Marcus Mason, Dr. Ann Grisham, Gerd Poppinga, Judy Kraus, Richard Knoepfel, Kelly Barber, Dave Brancamp, Cory Hunt, Camille Stegman

Members Excused: Shelace Shoemaker, Robert Elliott, Mary Frey, Dr. Carl Reiber, Kristine Nelson

Staff Present: Brian Mitchell, Jodi Bass, Debra Petrelli

A quorum was declared.

- II. **Public Comment** (No action may be taken upon a matter raised under public comment period unless the matter itself has been specifically included on an agenda as an action item.)

There was no public comment.

- III. **Welcoming Remarks**
Mark Newburn, Chair

Chair Newburn welcomed everyone.

- IV. **Approval of the Minutes from the July 25, 2016 meeting** (For possible action)
Mark Newburn, Chair

Ms. Kraus made a motion to approve the minutes. Mr. Knoeppel seconded the motion. The motion passed unanimously.

- V. **Update on the Year of STEM- Marketing Plan** (For information only)
Brian Mitchell, Director, Office of Science, Innovation and Technology (OSIT)

Chair Newburn commented having a year of STEM has been a complete victory. Mr. Mitchell asked whether everyone had seen the new website and had any feedback. The Council expressed general positive feedback. Mr. Mitchell said the contractor who is developing the NevadaSTEMHub website, has recently added two components to include the recognition of students and recognition of schools. He said a logo is currently being designed for both and once approved will go on the website homepage. He added the site currently includes all information to apply to become a STEM school and for student recognition. He added that within the infrastructure on the website, teachers will be able to submit names of those involved, the title of their project, a short abstract about their project, and a link to a short video where students can describe their project. He said this will serve as a sort of RSVP to determine the number of students participating. Mr. Mitchell said he is currently drafting a letter from the Governor to the seventeen State superintendents as well as a letter from the Department of Education to school principals that discusses the different recognition events and what is being done generally for the year of STEM. It will be sent out after all the needed information is on the website. Likewise with the school recognition event, there will be a school application which can be downloaded. Mr. Mitchell said the website has been a good way

of showing everyone what we are doing in Nevada and possibly open some doors for us down the road. He added that several people had reached out including the national company Oracle, who are interested in partnering with Nevada. It does show us that organizations outside of the state are hearing about these programs.

Mr. Mitchell commented that the marketing firm for the website has recommended waiting until after the New Year holidays to start marketing the website mainly because of extra expenses required when competing with so much election and holiday-related media. He said this firm has expertise with targeted web advertising which should help us target students on their social media and parents and teachers on Facebook.

Mr. Mitchell said the second phase is also being developed for the site. Currently, the marketing firm is developing an algorithm for a short yes or no assessment which will present to students 10 or 15 matches in universal STEM-related careers that may appeal to the student. He said he has looked at other states' websites and assessments for ideas and what might work for Nevada. Some features being developed include setting up an account, wherein the student can log in and out and save previous information on jobs plus be able to post career matches to social media.

Mr. Mitchell commented he has had good response on offers to do upcoming monthly events and believes he can get some media and legislators along with local businesses to attend. He added he can inquire whether the Reno Gazette Journal (RGJ), Las Vegas Review Journal (LVRJ) and others could assist with a series of articles that correlate with the monthly career themes. Ms. Barber said it makes sense to use news media for public advertising, but asked how are we getting that information specifically to teachers to implement or showcase these themes in their classrooms and if there will be a monthly newsletter or reminder with ideas for the classroom. Mr. Mitchell replied the first avenue into schools is the letter from the Governor mentioned earlier addressed to school principals. Mr. Mitchell said there is an option on the website to sign up for an email newsletter. He said there are currently about 60 people, including principals, teachers and other STEM individuals within Nevada communities that have signed up. He said to send it out monthly seems most appropriate at this time. Mr. Mason asked whether additional funding is coming for the website that could be used for advertising. Mr. Mitchell said there is no additional funding at this time. Mr. Mitchell commented we will be doing blog posts each month which could actually be used in the newsletter.

Mr. Mitchell said he is currently looking at different schools to have events which will correspond to the different monthly STEM themes which are outlined on the website. He pointed out that during the last Council meeting a representative from the Nevada Museum of Art and a representative from SWITCH both attended with interest in the 'STEAM' theme from that month. With December having the theme of Cyber Security/Computer Science and Coding, he asked if any Council members were aware of opportunities to engage the community. Chair Newburn asked whether a school has been

picked for the month of December's theme. Mr. Mitchell commented not at this time. He said he has had conversations with a K-12 school and with CSN with whom he assisted with funding a grant in the past to develop a cyber-security training program and are currently in the final stages of putting together an associated degree for that program. He added that perhaps they could do an open house for that program. Mr. Mason added they have STEM week in December at Booker Elementary School and discussed the benefits of the program at his school.

Mr. Mitchell welcomed the newest STEM Advisory Council member, Camille Stegman. Ms. Stegman gave a brief bio to the committee, she works in Storey County, previously the acting Administrator and now moving into the Principal position at both elementary schools in Storey County. She stated that she is the Executive Director of the Nevada Science Teachers' Association and acting chair of the Nevada STEM Coalition, as well as the District Director of the National Science Teachers Association that includes Nevada, California and Hawaii. The committee welcomed her. Mr. Mitchell commented that Ms. Stegman has replaced James Huckaby, who is retiring at the end of this school year.

Mr. Mitchell continued the conversation on the website and said sharing blog posts is another way to get information out to the teachers. Chair Newburn asked whether there was any success with the media as far as covering this as a current issue. Mr. Mitchell replied that a launch event took place on September 19th at Sparks High School with approximately 20 different companies along with UNR, TMCC, WMC and four TV stations. He said that Univision did a separate story on the event and a couple of newspapers did stories as well. He added that with the election, various other newspapers had been tied up until after the election is over and requested he get in contact at that time.

Chair Newburn said he is not aware of any events taking place in Southern Nevada. Ms. Kraus suggested trying to reach out again in Southern Nevada. Mr. Mitchell said due to scheduling, the launch took place in Northern Nevada but would like to put something together in Southern Nevada as well. Ms. Stegman said the Nevada STEM Coalition is finally coalescing their virtual STEM Summit and that might be a venue we could use to get more information out to the public. She added it will take place on November 28th at three sites, Regional Professional Development Program (RPDP), both north and south as well as east. She said there will be the option to virtually conference in, making this a good opener to get the Year of STEM out to the public. Mr. Mitchell agreed that would be a good idea.

VI. Review of Draft Strategic Plan (For information only)
Brian Mitchell, Director, OSIT

Mr. Mitchell handed out recommendations for the Strategic Plan based on feedback since the last council meeting. He said there was a need to discuss the strategies to use for some of these goals as well as their metrics. He

wanted to know what type of methods there are to measure these goals and what data is available. He asked whether the committee felt ten to fifteen pages were sufficient for length and structure for the Strategic Plan. The Council agreed that the shorter version was better and anything extra could be added into an appendix. Mr. Mitchell asked for clarification of the assessment and evaluation note from the last meeting at Reno Discovery Museum. He said it was identified as a need or STEM barrier to teaching STEM. Ms. Barber replied it is more about science and not necessarily assessment, as science is not a priority in some elementary schools. It may be teacher evaluation that is a barrier. Chair Newburn said it refers to the need for ways of evaluating STEM programs and their quality, which falls in the section on barriers. Ms. Stegman commented that if you make it a barrier, you could have a reasonable argument that not assessing science in the elementary levels is a barrier to STEM later on. Dr. Grisham agreed that is part of the argument, however the bigger barrier is the professional development for elementary school teachers mainly because they do not feel comfortable teaching science in certain schools, so if teachers are not comfortable with how to teach science, we may not get anywhere.

Mr. Mitchell referred the Council to the Needs Assessment and Identified Barriers to Improving STEM Education in Nevada and asked whether anything was missing with the sentiment about the lack of good assessments in science or math. Ms. Krause commented it should only say “teachers need assistance learning best practices for engaging and assessing.” It was agreed that by adding “and assessing” would clarify the section under Teacher and School Development and Support. Ms. Stegman pointed out she would be willing to flush it out as available instructional time, which could be classified as a barrier. Dr. Grisham said it was mentioned that instructional time was a possible solution. The consensus was it is considered a barrier and that adding something to instructional time in science was necessary under the section Teacher and School Development and Support.

Mr. Mitchell recommended they explore new partnerships and new ways of assessing STEM in science. Gamification technology was discussed as a method to assist in teaching science. A discussion ensued regarding the current assessment of science being taught, including science counting in the Star Rating and whether testing should be upgraded because it does not assess new standards. Chair Newburn said he met the task force working on the new Star Rating and explained what was happening with STEM. That task force agreed to add STEM information into their report. The Council agreed instructional time and assessing do seem to be a barrier. Ms. Barber pointed out that not assessing science in the elementary levels is also a barrier to STEM. The council agreed to eliminate number 4, “Assessment/evaluation.” Mr. Mitchell summed the conversation up by asking whether science is not valued in elementary school because it is not assessed. The council decided that instructional time was more the issue. The Council discussed at length the barrier issues of assessment, instructional time and testing. Mr. Mitchell discussed training professional development of teachers to integrate science

into other subjects. Ms. Barber commented she would prefer not adding another assessment but rather focus on the instructional time needed and not necessarily more testing. It was discussed there will be a science assessment summit on December 14th in Reno, which should generate thought and ideas about this subject, and may assist in the solution to the barrier issues of instructional time or lack of assessment.

Mr. Mitchell said this section is about the barriers in increasing STEM education or improving STEM education in Nevada, which includes instructional time of teachers as well as professional development of teachers on integrating science into other subjects. Mr. Mitchell pointed out this is not a final solution, but we could possibly recommend changes to the Star Rating. He suggested they move on to the recommendations portion and possibly make corrections under the Metrics section. He asked if the committee has access to ACT survey data. Mr. Knoepfel commented he could pursue an answer to that question. Ms. Stegman suggested they look at the student information website, Infinite Campus as a possible place to find data on what classes are currently being taken by students.

Mr. Mitchell referred the Council to the Metrics under Priority 1 that included “Increased number of students taking calculus, physics and other STEM-related AP exams, IB math and science exams;” and “Increased number of students completing CTE pathways in STEM-related fields are feasible,” and under the reference to “Increased number of students enrolling in and completing postsecondary STEM degrees and industry-recognized certificates,” he pointed out we should be able to get that information from Nevada System of Higher Education (NSHE), which is perhaps our best data source for tracking students.

Mr. Mitchell pointed out Priority 2 “Quality and Scope”, and said it refers to increasing the percentage of students who take at least one STEM course in each of the STEM disciplines between grades 7-12. He commented that some feedback he had received was whether it is a STEM discipline or defining the courses that would be required. For example, if you take at least one STEM class between 7th and 12th grades, what are the classes that would fulfill that requirement. Chair Newburn replied they would have to take science and math that includes engineering. Ms. Kraus commented this is a high school type goal because students have to take science and math in middle school every year unless we are measuring Robotics, which is an elective and not uniformly available. She added this should be 9th grade through 12th grade for the purpose of increasing STEM enrollment. Ms. Barber pointed out that the wording says at least one STEM course in each of the STEM disciplines. She said we are talking about a STEM course not just a biology class or calculus class and whether it is a true STEM course. Is it the integration of that content or are we saying just take a math class, science class, an engineering class and a technology class? Dr. Grisham said if science is Next Generation Science Standards (NGSS) aligned then it is STEM. Ms. Barber asked where that leaves math classes or current calculus classes. Robert Knoepfel commented we should be able to classify from the state catalog what is STEM

and what is not. Mr. Mitchell said the question remains, is STEM just a math class or a math class that integrates science, technology and engineering? Ms. Stegman commented this is a really big concern for many science teachers. Science is often replaced by a STEM class and math is never replaced with STEM, meaning science and STEM are not synonymous, they are very different things. She added if you are teaching science the NGSS way, you are essentially meeting STEM, however if we are not careful we may see some science courses like traditional biology or physics completely disappear when kids take a fun STEM robotics class to replace those traditional classes, for example, and wind up with no background in biology. Mr. Knoepfel asked about the classification and what falls under science, math, technology and engineering. Mr. Mitchell pointed out on the STEM website it is recommended students take four years of math and three years of science for STEM careers, however, that is all it recommends, it does not get specific to certain classes. The goal is for students to question their counselor, the website just sets the expectation that students should take more than just the minimum required courses to graduate if they intend to be prepared for college-level engineering or computer science, for instance. Mr. Mitchell commented on (3) "Increase the percentage of high schools that require three years of math and four years of science", and asked whether this is a duplicate of (4) "Increase the percentage of students who take a least one STEM course in each of the STEM disciplines between grades 7-12 Define STEM disciplines." Ms. Kraus asked whether we need a technology component. Chair Newburn replied that changes to the content of computer literacy standards are currently being reviewed. Mr. Mitchell commented that developing more computer standards are elsewhere within these recommendations. Chair Newburn recommended removing that bullet point. It was agreed unanimously to strike bullet point (4) "Assessment/evaluation." Mr. Mitchell said it was suggested that a certificate endorsement for STEM should be available for teachers and asked who would be responsible. Chair Newburn said the requirements would be made by the Commission on Professional Standards (COPS), however, it would be offered by colleges or other groups that offer professional development.

Mr. Mitchell referred the committee to Priority 2 "Metrics", 4, 5 and 6 outlining teacher effectiveness ratings. He said the idea was whether teaching would improve as a result of professional development. There was agreement it may create more problems than good, but possibly could be gauged by test or exam score improvement. The Council agreed they are not trying to tie it to the teacher, but are we as a state improving in any STEM subjects? Mr. Mitchell added if we are trying to improve the quality and the scope, we need to know how to measure it.

Mr. Mitchell referred the Council to Metrics "Increased number of students/classrooms experiencing quality STEM curricula" and "Remediation rate in math declines". Ms. Kraus said they appear to fall under "Increased number of schools with a STEM-specific charter, have received a Governor's STEM School Designation, or are progressing toward a Governor's STEM School Designation." Mr. Mitchell agreed. Metric "Remediation rate in math

declining,” was discussed and mutually agreed the ACT test currently determines remediation. Mr. Mitchell added that while NSHE has data and is easy to get, it does not reflect every student, but it is a good measure for such a large group of students. Ms. Stegman suggested that one of the metrics include equitable access, perhaps increase amounts of instructional time, especially for underrepresented populations. Mr. Mitchell asked whether the school districts track that information and report to the State. Ms. Stegman suggested perhaps districts could be required to report to the State, however, it might be difficult to accurately track.

VII. Discussion and Possible Vote on Additional Permanent Subcommittees (For possible action)

Brian Mitchell, Director, OSIT

Mr. Mitchell began a discussion on whether to create additional Subcommittees. Creating Subcommittees would be a good way to invite additional participation from others outside of the Council who want to take part. He said he would like to invite non-Council members to make up the membership of those Subcommittees and would invite any current Council members to join a Subcommittee. A member of the Council would Chair each Subcommittee. The first proposed Subcommittee would make recommendations on how STEM could support Arts and Culture education. A second proposed Subcommittee would evaluate applicants for the Governor’s STEM School Designation. He added that past committees developed some recommendations, however, these new Subcommittees would actually read applications and do school site visits. Chair Newburn referred to the “Subcommittee on Computer Science” and said there is a task force under the STEM coalition that was given the charter to come up with a presentation at the next STEM Summit as well as recommendations to the Legislature. Chair Newburn said he can Chair that Subcommittee. He added after their charter runs out under the STEM coalition there is still a need for this group within the State. Camille said she could make claim for Subcommittee 2 “Integrating Arts and Culture into STEM”. She added there is also an Arts and Integration task force for the STEM Summit. It was agreed it would be good if we already have the people to fill the positions in these Subcommittees who can roll right into them after the STEM Summit. Mr. Brancamp pointed out that Art Standards are up for revision next year and they are hoping to move forward similar to science by having more integration. Ms. Stegman agreed this would be a good Subcommittee to have and could offer up some names for that Subcommittee. Mr. Mitchell suggested there be no limit on the number of people to put on these Subcommittees, the more that are engaged as stakeholders, the more effective they will be.

Mr. Mitchell said he has been in touch with ChangetheEquation based in Washington DC, a STEM advocacy group and one of the programs they have evaluates different STEM curricula and programs through a very rigorous process and they have made an offer to help train our reviewers on programs. For teachers and schools that are not familiar with a program, they evaluate

the program and recommend which ones are the best programs to invest money in. He added one of the recommendations in the Strategic Plan would be to tie some of the available state funds and encourage districts as well to tie their funding to programs that have met the standards. Mr. Mitchell said just to emphasize the rigor of their evaluation, only 30% of the programs that have applied to Change the Equation have met their standard.

Mr. Marcus made a motion to form four Subcommittees: Subcommittee on Computer Science; Integrating Arts and Culture into STEM; Governor's STEM School Evaluation; and STEMWorks. Mr. Knoepfel seconded the motion. The motion passed unanimously.

VIII. Discussion of the Future STEM council Meeting Schedule (For possible action)
Brian Mitchell, Director, OSIT

Mr. Mitchell recommended a meeting in mid-November to formally approve this Strategic Plan. Also the Council is required to have two meetings in person each year and the group decided to look at the second week of January 2017 for an in-person meeting in Las Vegas.

IX. Consider Agenda Items for the Next Meeting Schedule (For possible action)

None added

X. Next Meeting Date will be determined at this meeting. The meeting will be video-conferenced between the Library & Achieves Building, in Carson City and the Grant Sawyer Building in Las Vegas.

XI. Public Comment (No action may be taken upon a matter raised under public comment period unless the matter itself has been specifically included on an agenda as an action item.)

There was no public comment.

XII. Adjournment

Chair Newburn adjourned the meeting at 5:05 pm.