STEM ADVISORY COUNCIL MEETING
July 31, 2014
10:05 am –2:13 pm
MINUTES

The meeting was video conferenced between the following locations:

Nevada Department of Education
Northern Nevada Office
700 E. Fifth Street,
Board Room
Carson City, NV 89701

Nevada Department of Education
Southern Nevada Office
9890 Maryland Parkway,
Board Room
Las Vegas, NV 89163

Present – Carson City
David Brancamp – Co-Chair No
Nancy Martineau – Support Staff
Shelace Shoemaker

Excused Absence –Carson City
Katherine Neddenriep

Present – Las Vegas
Mary Pike – Co-Chair South
Dr. Nancy Brune
Dr. Theresa Corry
Derek Fialkiewicz
Dr. Anne Grisham
Wes Harper
Richard Knoeppel
Sharon Pearson
Dennis Perea
Dr. Carl Reiber
Missy Young

Excused Absence – Las Vegas
Judy Kraus
Michael Mohar

- ***(1)Call to Order/Roll Call: and Pledge of Allegiance (Co-Chair David Brancamp & Nancy Martineau)*:**
  The meeting was called to order by David Brancamp at 10:05 am. Nancy Martineau called Roll Call and verified that a quorum was met.

  The Pledge of Allegiance was led by David Brancamp. The Pledge of Allegiance was recited by all members.

- ***(2) Public Comments (Co-Chair David Brancamp)***:
  Nancy Martineau – No public comments in Carson City
  Co-Chair Mary Pike – No public comments in Las Vegas.

  Co-Chair David Brancamp reminded the council when they speak or make a motion to please announce their name. Especially when we are in two locations and Nancy can't see who is speaking. Also to please turn off your microphones as it is difficult to hear the recording when typing the minutes.

- ***(3) Adoption of Minutes and Approval of Agenda (Co-Chair Mary Pike):***
  Co-Chair Mary Pike requested that everyone take a moment and look through the minutes from our April 28, 2014 meeting for any missed items that need to be corrected.

  Co-Chari Mary Pike noted two names miss spellings, Mark Muro should be changed from Marc and Dennis Perea changed on page 2.

  Co-Chair Mary Pike requested a motion to approve the minutes. Sharon Pearson made the first motion to adopt the minutes. Dr. Theresa Corry made the second motion. The council voted, and no one apposed. The minutes were formally adopted by the Council.

  Co-Chair Mary Pike requested a motion to approve the agenda. Missy Young made the first motion. Wes Harper made the second motion. The council voted, no one opposed, and the agenda was formally adopted by the Council.

- ***(4) STEM Background Information Presentation (Ray Bacon, Nevada Manufacturing):***

  David Brancamp introduced Ray Bacon from the Nevada Manufactures Association.

  Ray Bacon: He is the Executive Director of the Nevada Manufactures Association, and the Vice Chair of the Manufacturing Sector Council. He grew up in the manufacturing town of Corning, New York. He worked for the manufacturing sector of Corning Glass. Their employees paid about 80% of the population's property taxes. All the research and development was left in the community. There were many mothers and fathers with Ph.D.'s and Master's Degrees, which was pretty unheard of in the 1960's. He eventually came to Nevada to work for the manufacturing company Bentley Nevada and became the Vice President of Manufacturing at was there 14 years.

  Manufacturing is essentially the application of STEM to make products. Almost all manufacturing of products involves physics and chemistry. When you get into the food and pharmaceutical industry it involves biology and chemistry. The vast majoring is basic science. The engineering piece become those who take the hard science into the practical application of what actually happens in the factory processes and what the factory looks like. They do the product engineering and in many cases they do the process engineering.

In many cases the process is more important than the end product. In all of this, math is essential to understand the science. If you can't do the math you can't understand the science. There are some areas in biology that this is a little fuzzy, and that is becoming narrower and narrower. These are the essential's that make the pieces work. The one piece of the math part, which in not commonly understood, is when you go back to Eli Whitney in the early 1800's with his effort to do standardized parts, with all the parts interchangeable. He was the first to document making parts that were interchangeable. Think about today, if layout make products that aren't interchangeable then nothing work's. For example, automobiles need to have many interchangeable parts. This is the importance of what is taking place. Standardized parts are one of those things that becomes so fundamentally engrained today, that we don't really have an appreciation for it. At the student level, they do not have an appreciation at all what we are talking about.

When you take a look at the whole process of what we do in math, science, engineering, and technology pieces. That has allowed are whole manufacturing sector in the world, not just the United States, to make everything better, usually cheaper, usually faster, usually more dependable, and nearly always ends up with a better society for all of us. For example, back in the 1960's if you looked at a photograph from Africa they were not wearing manufactured clothing, but if you look at one today, they are wearing t-shirts that have been manufactured by someone.

Technology invaded the manufacturing world about the same time it entered the banking world. The computer technology began around the 1950's and 1960's. Banking and manufacturing were the two leading industries in technology. Banking has to do it to keep track of volume, and manufacturing had to do it to make products everybody needed. We had to make products consistently, better and faster. When you put these pieces together, computers are integrated into many of the parts and products that we make in the manufacturing sector. They are more deeply included in the processes that we do. The average manufacturing worker interfaces with a computer several times a day, on assembly lines, product design, finished good and testing.

We are looking for students of all levels that have to have a solid math and science background, whether you are going to be a line worker, an engineer, or a company owner. Project Lead The Way (PLTW) is the practical application of science and engineering skills in the work force. The majority of the students who enter into the PLW program head off to engineering schools, while some of them won't get there, but that is okay, they are still career ready.

<u>Four Companies and their unique processes in this area that are directly related to science.</u>

1. <u>Ebara International Cry dynamics Division, Sparks Nevada</u>:
   They are a manufacturer of cryogenic submersible pumps. They are used to load and off load liquid petroleum, propane, methane, and liquid natural gas. All are in the -260 to -270 range as far as it liquid state and shipped all around the world on a regular basis There is no grease in the barring's of those pumps. The surfaces are very highly polished stainless steel on the stator, propellers and the rotors.

They have a reasonably tight tolerance, but are cooled and the barring is kept lubricated by a little petroleum leaking in. What is really amazing is because you don't have to dissipate heat (because you are dealing with -260), in most electric motors the biggest chunk of space that is used are the cooling fins to keep the cooling temperature down. A 900 horse power motor in their world is about 2 feet in diameter and 4 feet tall. If that 900 horse powered motor was going to be operating in that ambient air temperature it would be about 6 foot by 6 foot motor or larger. It is relatively small until you have all that power. Then to make it more fascinating is LNG and CNG and all the things they transfer, are non-conductors. The wires that come down into the motor in this submersible pump are attached to the top and completely submersed in liquid. A first reaction would be water and electricity doesn't mix. We don't think about the fact that if it is a non-conductor it can work. About a third of their staff is physicists, and the rest are engineers. Most employees on the assembly projects are technicians. Some are just regular people that work on the lot.

2. Aloha Medicinal's, Inc. in Carson City, Nevada:
   They use about 4000 types of mushroom spores to manufacture what is in the same category as vitamins. They do not make medicine. One of the spores used is from the Himalayas at 15,000 feet and above. This sells for $30,000 a pound when you get it at the Himalayas. When they go get it themselves, bring it back and purify the specimen to a consistent purity and consistent quality. In Africa they can package up with water and the powder that is made from and it keeps people from going from HIV into AIDS. At about .16 to .22 cents a day and this is made in Nevada.

3. Timet, Henderson, Nevada:
   They take titanium oxide sand and turn it into titanium metal. All the operation has to be done in a vacuum. They take kettles that are about 6 feet by 6 feet and they weld them shut with a mixture of magnesium and titanium oxide and pour in various chemicals and they come out with a titanium sponge at the other end. They basically weld them shut and grind the weld off. The sponge is then made into titanium metal and various alloys. This process is all done in vacuum furnaces. Without titanium planes would not fly, or at least not as high or as fast. It is 7 times stronger than steel, and considerably lighter than steel at about a 1/3 of the weight and 7 times its strength. That basic supply of taking the titanium from raw materials into the titanium ingot which then goes to casting houses and various things all over the county is done in Henderson, Nevada, and is first in titanium worldwide, and most people in this state don't even know it is here.

4. Burns Machinery, Minden, Nevada:
   Their business card has a section that has been done with a led driven laser cutter that is nitrogen cooled instead of CO2. This laser is one of eight in the entire county. When you normally do a CO2 cooled laser, it cuts out about a ten thousandths path when you are going through steel. The led driven laser cuts a path that is two thousandths of an inch thick and it does it in incredible speed.

With the kind of material their business card was made of it does it in about two thousand inches a minute. Which means that all those punch presses we have to set up, and take a while to go through and punch things like front panels and back panels on many products that are made out of metal or plastic, can now be set up in a matter of minutes. This laser is software driven and can lay out your raw materials out in a matter of seconds. They have had requests at 8:00 am in the morning and have been asked can you do this today, and by 10:00 am the parts are done and amazing quality. You cannot believe the fineness of the cut. They make one product that goes to a water filter company. The company has slots they come off of a big disk. It has slots that come out that are five thousands of an inch thick. The first time they set it up and made the cut that little bitty wire that is a thousandth of an inch thick is still there. With any other process this would have been gone and burned out. So the scrap will still have wires hanging out.

These are things we have in Nevada, but the level of training we need for our kids is substantially higher. Their understanding of application of math and science is critical. We don't get quality products unless we do the statistical process and control the process.

Co-Chair David Brancamp: Thank you for showing us great examples in our own back yard.

Shelace Shoemaker: Great job! I completely understand that math and science are critical for our students. Thank you for brining that point up.

Carl Reiber: Good presentation. You spoke of the need for employees in manufacturing to have the background in math and science. Is there an industry and entity that has pulled together the specific skills that these various levels of employment would require of incoming employees? So that we as a group can try to get our heads around matching what we are delivering in the classroom to what the students will need as they move toward the workforce or into a University setting.

Ray Bacon: Yes maybe no. First the manufacturing sector is not simple. It is classified as the manufacturing sector, but when you start breaking it down the manufacturing sector there are wood products, ceramic products, steel products, metal products, electronic, automotive products, glass products, textiles, lumber, etc... If someone comes to us with basics, the actual skills that are needed on the job are fairly easy after that. If someone comes in without reading skills that would be tough. But if they come in and don't understand basic math, or the application of math, that makes it difficult. Physics is a mandatory course to graduate high school. For the average manufacturing company particle physics and some of that exotic stuff, some done post Newton is probably considered less important. But for everything up through Galileo and Newton, and probably all the way up to Niels Bohr. If they have this level of physics and understand the application of physics we can turn them into whatever we need. That is why Project Lead The Way (PLTW) is so important. PLTW gets them to the practical application. That basic engineering entry level program they do in PLTW, in the perfect world, every student would experience that. We are doing some things with community colleges

training people for the food sector. After culinary arts training you have about ½ to 2/3's of the basics you need for food manufacturing. The advantage of working in food manufacturing is you don't work weekends. The first program is at TMCC and about 60% of their first class where food manufacturing was offered is at least taking some of the classes to see how much they want to learn or how much they care about it. At some point in time this will permeate into high school programs as well.

Nancy Brune: Of the four companies you mentioned do you know what percentage of their incoming employees they employ from outside of Nevada? Or are they all Nevada born and raised? What percentage of those jobs require a two year vs those who require a four year degree?

Ray Bacon: Let me start with Ebara. Ebara, because of the nature of technology involved, has a fairly high percentage of four year degree programs. Everybody in the design and engineering side all have four year degrees. Probably 50% of total employees have four year degrees. Two year degrees are about 30-40%, and those with less than a two year degree are in the 15-20% type range.

Aloha Medical has limited amounts of four year degrees. They grow in the lab not in the dirt. It is a relatively small staff. Several of their employees come from an Alternative High School which is Pioneer High School in Carson City. This company does not have a large middle section, only both ends.

Timet is a union trap. Their workforce is around 700 employees. The union portion is about 500-550 and there is a technical bunch above that. There is a union training program which is a fairly complex and is in the range of a two year degree where they receive a union certificate instead of an AA degree. The balance of their staff would be four year degree people and some who come right off the street.

Burns Machinery is a fairly high end shop and their primary product is sprockets for the motor cycle racing people. Their sprockets are made out of tool steel, where the ones from the factory are hardened aluminum. Those that are into endurance racing would wear out a sprocket in about 30 hours of use. Theirs last about 21/2 years of use. They are still pretty cheap even though they cost about three times as much as the factory sprockets. The vast majorities of their machinists are hired locally and most have some experience as a machinist and some practical applications. When they start looking for people with programing skills they tend to go out of state. This is not a large company; it has a total of about 20 employees.

Derek Fialkiewicz: Do these companies have internships opportunities for our high school students, especially those that are in STEM courses at the moment? I agree they should have mandatory physics to graduate. Do they have opportunities to go into these companies to learn these fields for students that are in AP Physics and AP Chemistry to get experience needed to want to continue in those fields?

Ray Bacon: This is one of those answers you are going to hate as much as I hate giving it. The Taft-Hartley Act of 1947 fundamentally was the main rules that established the prohibitions on child labor law and various other rules. A machine shop was classified as a highly hazardess occupation so therefore child labor was banned from those facilities. In most cases until the student are 18, which automatically preclude most high school students. This is not universally true, but in most cases it is. If it is a highly precision machine shop it is exempt from that rule. In the definition of that rule is so blurry no one can tell the difference, except the workers comp rates are different.

Internships are a case by case situation. At Timet, because it is a foundry, the answer is going to be no. There may be some positions, but they would be limited. For Burns Machinery because it is a machine shop the answer should be yes, but I think it still may be no. I don't believe Aloha Medical would have any constraints. I am not sure how Ebara is classified, and don't know enough to know if they do have any programs. We did bring some students in there, and it was complex in cryogenics enough that some of the students didn't get the magnitude of what they do in this place. Even some of the teacher could not understand electrical in liquid.

Carl Reiber: This is a follow up on the internship question. I think where you are going is that pipelines are critical in workforce development. Our youth in Nevada are exposed prominently in hospitality and gaming, this they go into hospitality and gaming. Are there other outreach opportunities that either K-12 the University system or the Industry Partners can engage in to enhance the exposure of the manufacturing industry to the students so they can see this as a clear pathway to a quality job and career?

Ray Bacon: The answer is yes. Starting three years ago, the first Friday of October is National Manufacturing Day (NMD). Last year we had great participation in Northern Nevada, and not so much in Southern Nevada. This year that falls October 3rd and we have a Nevada 150 event that will take place at John Ascuaga's Nugget October 1-3. Day one is a seminar for the manufacturing companies to prove their abilities; day two is a trade show of which we hope to have many Nevada made products open to the public; day three is National Manufacturing Day. We will be doing plant tours just about every day of that week. At this stage Dana Ryan and her crew are deeply engaged a whole bunch of companies and a bunch of her people and her signature academy will be going on tours that day. Carson City is fully engages. Last year we touched about 3500 students, almost all in the Reno, Carson, Douglas areas. We didn't delve too much into Lyon County said yes, but were unable. This year Lyon and Churchill Counties are onboard, but we don't know about Storey County, and limited effort in Clark County. It is so huge and spread out that it is hard to get students to attend because for the time it takes to get across Las Vegas of about 45 minutes.

Missy Young: It does not take 45 minutes to get across Las Vegas. I am from Los Angeles and traffic in Las Vegas is nothing.

Ray Bacon: Manufacturing guys are strange. Members in Las Vegas won't attend a meeting in Henderson, and members in Henderson won't travel to Las Vegas. I always have to have two meetings.

Missy Young: That is strange; I drove from Henderson to Las Vegas for this meeting.

Derek Fialkiewicz: The whole point of my idea behind internships, and the idea of getting our high school students involved is to keep our talent in Nevada My experience with high school students in Southern Nevada is that our extremely talents student, especially in math and science don't see a future her in Nevada. They have to go out of Nevada in order to get a quality education, and to get a quality job in a STEM related field. I think if we can show them there are opportunities in Nevada we can keep them here and that should be our goal.

Ray Bacon: I agree. Felicia Gonzales and I are in contact on a regular basis. A significant portion of her graduates lead the state in secondary education regardless of what it is and the same is true at Northwest. I have not been to West, Veterans was under construction, and East it has been five years since I was there. The CTA's are doing a wonderful job, but unfortunately a large portion of their students are escaping the state for their post-secondary education.

Carl Reiber: The numbers are changing. At the University of Nevada, Las Vegas (UNLV), University of Nevada, Reno (UNR), and College of Southern Nevada (CSN) have stepped up to the plate the last couple of years. We have been looking at Clark County School District numbers. And look at the pyramid to UNLV. The students who are seriously looking to go to college, we capture the majority of them. I am with you on that the absolute best and brightest will go out of state, and are given the opportunity to go to the best institutions in the country and they take advantage of that. We are starting to see more and more national finalist coming to UNLV and UNR. I speak for UNLV that our honors college doubled last year and is doubling again this year, taking the best students that are out there. This is not an accident; we have been on an aggressive campaign and will continue. The very top students I worry about because they are leaving and that is a brain drain. The next chunk down is staying here, but I worry about them in this diverse economy with diverse employment. My real concern is the tier that is not college ready. This is where the Brookings report from our last meeting was so important, Because alternative STEM careers, the certificates, and those less than a bachelor's degree, but more than a high school diploma really can keep those students in Nevada and in gainfully employed in careers that are far more reception proof that some of our more traditional careers.

Co-Chair Mary Pike: I see no more questions in the South.

Co-Chair Dave Brancamp: Thank you so much Ray for your time and all your information. At this time I will call Vance Farrow and Randy Hunnewill to share further information with us.

Randi Hunewill, Nevada Department of Education, Career and Technical Education. She concentrates on health and public safety; and is one of the original board members of the Health and Medical Services Sector Council; and currently the Chairman of the Education and Training Committee.

The Sector Councils have been working very hard for the past few years and appreciate this opportunity to present to the STEM Council. On behalf of Vance Farrow who had a last minute brow band connection committee he was assigned to by the Governor's office, and Dr. Marsha Turner, Chairman of the Health and Medical Services Sector is on vacation.

An overview of what the Health and Medical Services has been working on to recognize the needs of our state. It is very obvious and is documented in all research and reports about the need for health care in Nevada and this was in our minutes about the Brookings Report. The committee has taken data and research to find out where we are at in Nevada. The committee consists of Secondary, Post-Secondary, Business and Industry, CEO's, Hospital Associations both rural and larger. Our rural's are so unique and this does affect our education.

Ray Bacon spoke about retention. Retention is huge, and we are losing some of our top students to out-of-state for numerous reasons. These students are putting thousands of dollars into their education and we are losing them, like physicians and such, to out-of-state. One of the biggest reasons is economics and what we can afford to pay them. What it comes down to is, they can make twice as much money out-of-state, but they are getting a great education here. At UNLV we have excellent post-secondary programs at that level.

Committee members received the Health and Medical Services Sector Council's layered strategic plan. To report on the education objectives, this meeting was very timely. She had a meeting as Chairman regarding some of these changes. Key factors this committee would like to have documented.

- We have always had STEM.

- We also have a representative from K-16, Linda Johnson who represents our Private Institutions, our Charters, and on-line.

- Our committee objectives support the academic standards for the state. It is very relevant and directly related to our retention. When the committee travels around the state especially in business and industry one of the things that is always noted is there a lack of skills, especially in math. These academic content standards make education and with the New Generation Science Standards make students step it up in order to be successful. Whether it is college or career readiness, they need these skills.

- We do have difficulty within our education in secondary rural programs. It is very difficult to fill these spots. When we are filling them, we have lack of experience in math. We are filling these positions with provisional with less credit that is notable to teach the recommended standards. But this is better than not having a teacher at all.

- How can we promote to get more teachers out there in math and science?
- The Sector Council has a strong connection with business and industry, and support within the schools. The question has been brought up about apprenticeships and internships.

  The key term the Sector Council in the Secondary and Post-Secondary is clinical which is a term used in the medical field. This is a requirement of all our Secondary Students. Randi has supervised almost all the state standards within the Health Science realm of our Secondary Schools including medical assisting, EMTs, nursing, sports medicine, and we are in the process of doing the pharmacy standards. These all include internships and clinical. Very relevant to a student's success; they need to get out there.

  We have not experienced the problem as far as age, but we are experiencing the problem as far as HIPAA and other costly things. In order for them to get into a health care environment like a Doctor's office or hospitals they have to have background tests, vaccinations, etc… On behalf of the Nevada Department of Education and the networking system Randi is presenting next Friday at the Rural Hospital Association CEO's meeting at Lake Tahoe to get their support.

  We have a low percentage of our Nursing students becoming certified in the state because of the cost. Our CEO's of our Hospital Associations are very interested in our secondary and post-secondary programs and want to help with this situation. It is very important for these students to have these strong academic backgrounds. Our health science standards, as long as they have the appropriate teachers teaching them and have biological science endorsement, or a physiology endorsement then these students will get science credits. It has been noted for a few years that our health science students in the State of Nevada are the highest placing students on their exit exam. The standards are very rigorous. When these standards were taken to Truckee Meadows Community college they wanted to know who would be teaching these courses. Our answer was mainly registered nurses.

  The support of STEM has been implemented. We are getting closer to and support the definition of STEM. Some schools have declared themselves as STEM schools. When asked a question about STEM schools, we are not sure how to define it.

  The Sector Council is actively seeking funding. Vance Farrow has written a grant and submitted it on behalf of the National Governors Association that

supports training in education and looking into research. It is definitely something we need to do more professional development on in order for our students to be successful in all the areas you heard from Ray Bacon. The math part is very important, and in our standards we use the term medical math. She thanked us for our support and looking into this and realizing how important it is for our students to have a strong background in STEM education.

Co-Chair Dave Brancamp: Are there any questions in the North? No questions in the North.

Co-Chair Mary Pike: Are there any questions in the South?

Carl Reiber: The bio math industry is very close to his heart as he is a cardiovascular physiologist and has been engaged with many students in the pipeline to the bio medical industry. As pointed out, the Brookings Intuition report lays out the fact that the Bio Medical industry at large is going to be one of the fastest growing STEM consumers of students in Nevada. Many of those employees are being brought in from out-of-state because many believe our students are unprepared or don't have their certificates. With the clinical programs we are in a catch 22. One of the reasons is that UNLV during the great recession cancelled its program in clinical lab sciences. It couldn't grow because we didn't have the clinical positions to put the students. There was some, but not enough to keep the program sustainable in the long term. CSN picked up some of it but at this point UNLV really does not have a clinical lab science program that is feeding the state. There are other areas like occupational therapy that we don't have the infrastructure to move the students from the classroom into the workforce. What are your thoughts on how we can incentivize our public and private entities in the state to build those clinical slots so we can bridge that gap from the Career and Technical Schools, Community College, and the Universities to get those students out? In many instances those clinical spots are required for licensure.

Randi Honeywill: Excellent question and this is a current topic I am working on. One of the things is we get state and federal funding, with some of the federal funding we have made a priority hearth care program, and with our state competitive funds we are putting the needs of our state as a priority. Health care programs are very high on the list. She was very proud to say they are directing a couple of million dollars to post-secondary schools, and state competitive to secondary schools to develop or enhance new programs and many of those are health science. In 2008 the health science only had one set of standards called Health Occupations and they were very general and not rigorous at all academically. In the last four years we have created many including Bio Medical and Forensic Science. I am on several advisory committees including the Nursing Advisory Committee and here this all the time at the post-secondary level. This has been approach by Bill Welch of the Nevada Hospital Association has asked Randi to create a survey with the instructors and what are some of the needs so he could approach his CEO. He works with the larger hospitals like University Medical Center (UMC), Renown, Carson Tahoe Health and Joan Hall is the president of the rural hospitals. This is absolutely a continued problem. One thing we have shared and are going to instigate is that we have

not looked in a different direction. We have forgotten about two entirely different options; one is trauma medicine and putting them out on ambulances to get them experience. The other is putting them into our Tribal Clinics which has not been done before and they are very open this this because they in high need for employers. Those will kind of fill in those gaps. There is going to be some legislature going forth and opening up these clinical areas. The problem is there are state laws requiring how many you can supervise at a time. When you go out as a nurse you can only have six or so and that makes it hard to get the funding because most of our agencies or entities do not have that type of funding. That is one of the barriers that this grant is working on with the Governor's office. Hopefully down the road these things will be made very public through these statewide boards, and they becoming very receptive of it because the need it only going increase so we are going to have to make the doors semi-permutable.

Co-Chair Mary Pike: Any more questions in the South? No more questions.

Co-Chair Dave Brancamp: He thanks Randi Hunewill for her time and passion towards STEM.

Co-Chair Mary Pike: Introduced Wesley Harper,

Wesley Harper, Member of STEM Council, and a Member of the Governor's office of Economic Development (GOED): He is member of Dr. Brune's sub-committee and their charge is to "Develop a Strategic Plan for the Development of Educational Resources in the fields of STEM to serve as a foundation for Workforce Development; College Preparedness; and Economic Development in the State. Also to conduct a survey of Education Programs, and Proposed Programs related to the field of STEM in this state and other states to identify the recommendations for the implementation of such programs in this state." Related to this mission we began to wonder who is doing STEM well, whether it is in this country, out of this country, in this state or other states. How do you measure it, and what can we learn from what they are doing? That boiled down to three questions which are the responsibility of our sub-committee.

- How well or poorly is Nevada doing in STEM
- Why?
- What is the best way forward after we have the answers to the first two?

In reviewing, and trying to understand what the outcomes are in a strong STEM environment. Most the occupations that deal with STEM deal with the productivity and efficiency of processes, construction and production. There is another significant portion of STEM that deal with quality of life, and that is Health Care and the like. Looking for a measuring stick to evaluate where we are on the spectrum; a measuring stick can be easily or at least garnered from productivity and efficiency. A way to measure STEM outcomes that seems fair and reasonable is when you start looking at the GDP per capita, of a country, state, or a society. Looking at that and across the world, there are two countries that consistently show up as leading the United States Gross Domestic Product (GDP) per capita. One is Norway, and the other is Singapore. Just a side note on GDP

per capita. Depending upon your source you can get very different results. Leading source is International Monetary Fund World Bank, Central Intelligence Agency, and Bureau of Labor Statistics. I have put my confidence in Bureau of Labor Statistics. However, all of them show that Norway and Singapore are ahead of the United States by a fairly good portion.

- What is their STEM education?
- Is how they do STEM education transferable?
- Are there some best practices that we can import to help what we are trying to accomplish?

The short answer is no. Norway's education system is huge. They have about five million people, and their chief industry is oil, natural gas, fishing, and their bread and butter is petroleum which is tightly regulated by their Government as well as their education system. There are no grades for their students from Kindergarten through Seventh Grade, and college is free for everybody. Their structure does not transfer to what we do in the United States.

Singapore has about five million people, and is about four times the size of Washington, DC. Their primary industries are consumer electronics and IT, which are very heavily in STEM. Their education system is tightly controlled by their central Government. It is very regulated, and not a place they are looking to encourage variations in process and thought they are looking to educate you in a precise manner so when you enter the workforce they are confident you receive information in a certain way, and you present information in a certain way. This is completely counter culture to what we are doing here.

With international comparisons aside, how are we doing against other states in this country with the GDP per capita as a measuring stick? In 2013 Nevada's GDP per capita was about $44,000. That puts Nevada 31 out of the 41 contiguous states. Alaska and Hawaii are doing different things all together, and don't consider Washington, DC for reasons that its economy is boasted by the surrounding states. The United States GRP per capita is about $49,000. We are approximately $5,000 less than the average in the United States. The highest GPD per capita is North Dakota at about $70,000, and the lowest GPD per capita is Mississippi at about $32,000. This gives us a little context as to how well we are doing. This leaves the question of why is our number not higher or lower. This has to do with data analysis of which he is working on with his agency GOED in order to start to figure this out. The why has a lot to do with things that are not of an equal playing field? The theory is that states with a higher GDP per capita have a dominant STEM industry that is heavily influencing the education system, as Ray Bacon spoke about Corning. Wesley is originally from Detroit, and in Detroit the education system is heavily influenced by the automotive industry. Engineering in Michigan looks a certain way, and engineering in Washington State is dominated by Aero Space looks a different way. You can take the same titled mechanical engineering titled class but points of influences are not the same. When we have a truly dominant player of employment in STEM occupations they will help to color and influence the types of points of emphasis

we will have in our education system; which will raise our ability to provide the kind of education that employers are looking for like in a truly dominant player such as Boeing or General Motors. Then you start to create some clusters, ecosystems, and hubs that you have related industries that depend upon the same points of interest as STEM. The education system by theory starts to respond to that and you start to get more of collaboration and a linkage between on what industry needs, and what the education system is providing.

Co-Chair Mary Pike: Thanked member Harper. She mentioned they had that discussion with the sub-committee and that this goes back to the skills as member Reiber discussed. What specific skills do we need? Until we know those skills we really can't modify our education system. We know reading, math, and science. We still need to identify some skills. There are no questions in the South.

Co-Chair Dave Brancamp: We have no questions in the North, but would like to express our deep appreciate for the information Member Wesley Harper presented to the Council.

(5) STEM Advisory Council Sub-committee Reports (Dr. Nancy Brune, Sharon Pearson, and Michael Mohar):

Mary Pike: Introduced Member Dr. Nancy Brune from the Sub-Committee A & D. This Sub-Committee has a new name. Member Brune will inform the members of the new name, and discuss the Nevada STEM Survey and we will have some discussion on the implementation plan.

Dr. Nancy Brune, Report on STEM Survey: The Sub-Committee met and out new name is "Educational Resources and Strategic Planning Sub-Committee." It would be appreciated is the members could refer to our committee by that name in the future.

We came up with a survey instrument we intend to send out to Nevada Educators and around the country. The first part of the presentation will be about the survey, and the second part will be about the implementation plan and open up for discussion on how we plan to disseminate the survey and retrieve feedback.

Co-Chair Mary Pike: She suggested we skip over the general ones, and discuss the ones the Sub-Committee had the most discussion on. It would be important to read the introduction as this part is critical to introduce the survey.

Nancy Brune: When we send the survey out we will have the introduction as it is written to frame the motivation as to why we are sending it out. Especially to other states who will receive the survey, or the link to the survey. We will also include a definition of Survey. We came up with a definition of STEM in our Sub-Committee, and noticed another Sub-Committee revisited the definition. Once we agree as a full group on the definition of STEM we will include that in the survey introduction so that educators in our state and other states understand what we mean by STEM. We noted in the

introduction that this survey will be anonymous. And we had some discussed in the Sub-Committee the idea that we will commit, and that people are less likely to take a survey if they don't understand why they are taking it, or what they get out of spending their time. So we are committing to send them some type of summary data and some sort of high level analysis of the survey once we compile them. The survey is 23 questions long, and we think it will take about 15-30 minutes to go through and take. We have made it very easy by trying to have drop down menus wherever possible so they don't have to write it again and it will seem to be very user friendly.

- The first 6 questions really get to the background of the survey taker. What type of school are you teaching in such as rural vs urban, elementary vs middle?

- Around question 7 we start trying to assess what is going on in their classroom and in their school. There was some discussion in the Sub-Committee that a couple of people felt strongly about it could be a teacher of administrator taking the survey and that they could not be doing STEM in their classroom, but STEM could be carried out at their school. We need to distinguish where STEM is carried out in the classroom vs the school where appropriate.

- We modeled a lot of the questions from question 7-20 on a couple surveys that have been disseminated through the National Science Teachers Association. There are a couple of models that we looked at in coming up with some of these questions and tailoring them as we thought was appropriate given what we are trying to get at on our survey. If they have STEM in their classroom or in their school there are some questions about the nature of STEM.

- Example, question 8: Has STEM education been integrated in something OTHER than simply adding science and math courses into your schools. We are really trying to make sure that we are talking about STEM as we understand it. We get into distinguish or differentiate between STEM being offered in the classroom as well as STEM being offered through extra-curricular programs. Programs like "Project Lead the Way" which is offered during the day and those offered outside of the day like Science Fairs and Competitions. We are trying to capture formal as well as informal offerings that are at their school.

- Then we asked them about STEM resources, does their school have a STEM Coordinator, or specialist. Do they have facilities, books and mortar to support STEM such as labs, designated STEM labs, and different sorts of STEM projects.

- From question 22-23, what we think is important, that relates to a STEM school is there a business or industry that is partnering with your school to support the STEM offerings?

- We have a question 20a, and 20b to really capture whether you're specifically working with a business industry partner. And then asking them how you partner with that business or industry.

- Then was ask if their professional development opportunities focused on STEM education available to the person taking the survey.

- Finally we ask them what they see as a challenge to implementing STEM at their school and or in their classroom.

- Concluding with a question asking is there is anything they want to share with the STEM Advisory Committee.

Co-Chair Mary Pike: Are there any questions in the South?

Carl Reiber: In our GEAR UP survey of Middle School STEM Teachers in the state, we had a qualtrics survey with similar questions. Then we followed up with an ono-on-one skype interview. There was a subtle difference between how a teacher answered questions vs asking the questions face to face. If you asked a teacher if they engaged in STEM they may say yes, but there was hesitation in their voice when you interviewed them face-to-face. There was no clear reward structure engaging in STEM in their mind. What we are getting from a survey from this is clear yes's and no's. It was clear that most of these teachers were disturbed that they were being imposed upon to do this STEM stuff. They weren't feeling like it was incorporated into their award structure. It was an attitude issue that disturbed us. Is there any way that we can capture that? The only way we could put it into context was to ask if there is a clear rewards structure both for the teachers and the students for engaging in STEM activities. I think with the Next Generation Standards there are, and we interviewed before those were released and may have interviewed too soon.

Nancy Brune: I think we can sort of tease that out and give a possible answer in question 22. It may be that we include another question after question 21 that reads "Do you feel there is a clear reward, or sense of structure to teach STEM in your classroom or at your school?"

Co-Chair Mar Pike: We could also add a spot at the end to provide contact information, and ask them if they are willing to provide further follow up with us. We talked about how this is going out to all teachers which includes: Physical Education (PE) Teachers, Health Teachers, English Teachers, and everybody. We want capture whether there is inter-disciplinary STEM instruction going on. That is why is says not applicable because a PE Teacher might say absolutely not, I don't do anything. However, at some schools there may be teachers who integrate STEM throughout the day, and always trying to integrate math, science skills, and critical thinking skills throughout the entire staff. We also want to capture that, and this also aligns with the rubric and the other piece Member Pearson is going to present as well.

Anne Grisham: Thank you for working on the survey; it has been a daunting task. In the elementary schools science has not always been encouraged because high stakes testing has always been math and science. It might be asked "have you been encouraged to teach

STEM? In what ways have you been encouraged to teach STEM?" This gets to the integration aspect Mary Pike was taking about. I looked at your question 16 asking if clubs are available. My question is "what is the reason for not offering the clubs?" For example: we consider ourselves a STEM school, and we don't do after school clubs because of busing. For someone to just say no may give a wrong impression. The why is important.

Richard Knoeppel: I want clarification on question 11, and why you chose to us the term computer science activities as opposed to computer based activities? As a STEM teacher when I see the term computer science, I think of pure programing. And I know you would get some good data off of that, especially an elementary school. Maybe the word like computer based activity as classes or courses, and then have your e.g. asking about coding, asking about programing. I also wanted to make a comment that you adhered so closely to this implementation framework. That makes our Sub-Committee's job better and we will have a closer relationship when this date comes in.

Co-Chair Mary Pike: We could say "does your school offer STEM computer based/computer science activities?" We didn't want them to say I do a reading program or all my kids login and do a reading program and consider that a computer STEM activity. We want them to understand that just because they are on a computer that it is STEM related. The State Board of Education, including Member Newburn, is very interested in the STEM computer science piece and the coding piece because that does enhance problem based learning, critical thinking, and problem solving. The coding piece, hour of coding, is all K-12 activity.

Wesley Harper: Talking about implementation of the survey and practical application of the survey, are we still talking about the survey question?

Co-Chair Mary Pike: What we need to do is figure out the final questions. We really need to get this disseminated and if possible action, we should try to finalize some questions. Then once we have the survey finalized should move into the implementation piece.

Missy Young: On question 22, one of the other optional reasons why we may be lacking physical infrastructure is some of the schools are old; some of the kids are in trailers. They just might not have the physical infrastructure to implement technology wide activities across the school.

Theresa Corey: I suggest if we are going to do a why not, we should include both: why and/or why not. Because, when you just say why not it is a slam.

Anne Brune: Would you suggest that we add why and why not to the other related questions? For example:

- Question 14-What other STEM activities are offered to your students during the school day?

- Question 15 – Are your students regularly involved in STEM competitions? They have yes, no, but to ask if so why, or if not why. Do you think it is useful to add those questions? Or do you just think it is relevant for the afterschool STEM activities?

Anne Grisham: Yes, I would include those questions. Sometimes it does come down to I don't have the staff to do it; I don't have the funding to do it; I want to do it, but I am limited. I do agree to add the why's and why not's and that it could be a slam if you only as the why's.

Derek Fialkiewicz: On question 15a; would we want to include Science Olympiad in that list as well, because that is now going down to the elementary level. And many schools are getting involved in that.

Mary Pike: Yes we will include that in the list. We tried to come up with a list, and there is Math Olympiad in the so Science Olympiad should be on the list.

Sharon Pearson: I get a lot of surveys to fill out and I usually am frustrated with them by the time I am done with them; simply because it really doesn't share what I want to say. I appreciate the why and why not. On question 23 "Is there anything else you would like to share?" Maybe we could also say "or clarify in your responses". Something that allows a because answer.

Richard Knoeppel: Do you see any merit in piloting this survey? Having done things in the State for Career and Technical Education (CTE) is we took our surveys and put them together based on state standards and sent them out to teachers, and also sent them to industry and high education. Everybody was able to see it before it was ready to go. People besides that committee were able to provide feedback. Then we were able to fine tune it a little more before sending it out to the general public. Then the results were a little better and we were able to drive the standards in the direction that they went.

Nancy Brune: I like that idea and am open to pilot that in and come back in October with the final instrument.

Co-Chair Mary Pike: Member Knoeppel who would you want to pilot this with?

/Richard Knoeppel: It is really up to the committee. In the past we have sent them out to entry members. Ask them if this is reflective to what going on in the state and what their perception of STEM is in the State of Nevada. We sent them out to members of UNR, UNLV, and CSN and said, "Is this reflective of the type of things that you things you think should be reflective of the state, because this was for the state standards for engineering, CAT, ARC for Drafting. Then we were able to see what their responses were and what their perceptions of what is going on in the state. It also gave them the opportunity to provide feedback, and tell us what other things they think we should be asking, or was there a question that was unclear. Then take that and fine tune the instrument and send it out to teachers throughout the state.

Derek Fialkiewicz: I do believe we should add educators to that list for that pilot so we do get an educator perspective. We want STEM teachers to look at this and give us their perspective, and administrators who can look at this and give there feedback as well. So it is not just an outside perspective, but also an inside perspective.

Shelace Shoemaker: I am a STEM Implementation Specialist at a school in Washoe County and I will volunteer my school, or class for the pilot to do this if we want. I have a close relationship with them and can get that feedback from them how they feel about the survey personally.

Co-Chair Mary Pike: Thank you. That sounds like a good idea. I know some other schools down south in elementary, middle, and high school that would be willing to take the pilot. With Dr. Reiber on the council I am sure he can send it out to some of his colleagues as well.

Co-Chair Mary Pike: Any other comments in the South?

Anne Grisham: There are a number of schools represented here, and with schools in the North that would give you a pretty good idea whether it is a good survey or not.

Theresa Corey: Could we also include some rural schools in the pilot because we want to make sure we incorporate their ideas.

Co-Chair Mar Pike: I think that is a good idea. Member Shoemaker, are you in a rural as well.

Shelace Shoemaker: I am not. But I do know a couple of Principals at rural schools I can talk to and see if I can get them on board with us.

Co-Chair Mar Pike: Member Brancamp are there anymore comments up North?

Co-Chair Brancamp: Just a couple. Thank you Member Brune's committee and for the survey. Great job. One thing to consider is to take all this feedback and reconstruct it and bring it back to us in October, which I know you are more than capable of doing.

We all need to remember that we have a report to the Governor, State Superintendent, and Legislative Council Bureau due by January 31, 2015. In which this data from the survey would be needed. As we look at item 8 future agenda items, we can add to that, but when we are picking meeting dates we need to give your committee plenty of time to get the survey back out, get it collected, and bring data back in a quick fashion of January's meeting. So far what we have picked is October and January. Knowing that fall is all the holiday time. I want to make sure everyone is very cognoscente of those pieces as we put this puzzle together.

The other piece that is in the survey for everyone's information sake is it says the STEM definition. The State Board adopted the State STEM definition June 1, 2012. The STEM

Advisory Council has the right to suggest the Board re-examine the definition. The current definition would be the one we use if it left the building in October. We can always make a recommendation as a Council to the Department of Education to reconvene the committee to bring that definition back for further study. The definition we see on the board is what was adopted and the one we all have to play off of whether it is widely known or not at this moment in time. It doesn't mean we can't go back to the Department and make suggestions to look at this again. Just know the timeline on that, and that I would need to make sure the State Superintendent knows that is a future item for the State Board. We would have to reconvene a committee to re-examine that because that is how those are done from legal point It is doable that we can readjust the wording, but at this point in time on a timely essence that would be the definition that would fill that box.

Co-Chair Mary Pike: I would then suggest we put the current definition in the survey and that can be an item we can discuss next year since we have until June 2016. This should not hold up this survey.

Before sending this out to the sample population I have some suggestions on some items we should add. Then we can have a motion to move this on.

- Question 11 – change to: Does your school offer STEM computer based/computer activities.
- Question 15a – Add Science Olympiad
- Add Question 15c –Why or why not?
- Add Question 16c – Why or why not?
- Question 22 – Add, "lack of physical infrastructure" as one of the options. There is another where they can add comments.
- To clarify where is says " Administration does not support STEM Education we are trying to capture the fact that Member Grisham talked about many Elementary Schools not teaching science, but we didn't want to put it in like that. Hopefully this will capture that as well. They can also click on as many that are applicable.
- Question 23 – Add "Is there anything else you want to share or clarify about any of your responses."
- Add new question: Are there any incentive's offered in STEM Education?
- Add if they are willing to put any further input it is optional to add contact information. Do you want to make this is anonymous if they want it to be?

Ann Grisham: I wondered about the incentive piece. My teachers don't get incentives for teaching anything, much less science. Can we also say intrinsic and extrinsic incentives?

Theresa Corey: We want to say "Are there any intrinsic or extrinsic incentives for teaching STEM at your school?"

Co-Chair Mary Pike: Thank you, Member Corey has that one down. We also need to make sure we add if they are willing to provide any input that it is optional to provide any contact information. We want to make this anonymous if they want it to be.

Richard Knoeppel: Do the incentives have to be only for the teachers, shouldn't it be for the students as well. Like for Project Lead the Way the students have an opportunity to gain college credit which would follow with them. Maybe there should possible be another question asking if there are incentives for the students going through these programs.

Co-Chair Mary Pike: This could be 26a and 26b.

Shelace Shoemaker: Could we at a why or why not to question 10a for the engineering courses?

Co-Chair Mary Pike: So noted.

Dennis Perea: On question 20a is it possible that we ask whether they have engaged industry or whether industry is receptive. Not all industry is created equal. Outside of this I may have an agenda, but I am curious as to whether they are coming to the table. There are some highly coordinated industries that are very good at it, and some that aren't, and in some rural areas they have large employers.

Co-Chair Mary Pike: Are you speaking of question 20a, 20b, and 20c? How would you modify, and would you need a 20d?

Dennis Perea: I would like to figure out some way how they engaged the industry, and if industry has been receptive.

Co-Chair Mary Pike: Instead of just saying have they been involved in STEM education?

Dennis Perea: That would be alright, but if their answer is no, I am curious to see if industry is holding up their end.

Co-Chair Mary Pike: So maybe if you don't have one, are you trying to secure one? Is that you are what you are trying to ask.

Dennis Perea: Yes, in my uncoordinated way.

Co-Chair Mary Pike: I just wanted to clarify so we can get all this down. So again, if no, why not. Any more corrections in the South for questions we may have missed?

Nancy Brune: On question 11 "Does your school have computer based/computer science activities classes?" Ask a why or why not, just as we did for the engineering courses on question 10a.

Co-Chair Mar Pike: Are there anymore comments in the South? Member Brancamp, are there any in the North?

Co-Chair Dave Brancamp: No, Member Shoemaker and I are happy you were able to guide all those steps. Well done, thank you. We do have our State Superintendent with us, so before we take our break we will let him say a work to us all.

Co-Chair Mary Pike: Thank you Member Brancamp. At this time if there are not others, can I have motion to accept the survey document as amended with the clarification that we will just send it out to the sample population?

Nancy Brune: I make a motion to accept with suggested changes.

Richard Knoeppel: I second to accept.

Co-Chair Mary Pike: We have a motion by Member Brune, and a second motion by Member Knoeppel. All members approved. We do want to talk about implementation. Member Brancamp would you like to introduce Superintendent Erquiaga first, or go ahead with implementation?

Co-Chair Dave Brancamp: Because his schedule is extremely busy. We will introduce Superintendent Erquiaga now so we won't take up more of his time.

State Superintendent Dale Erquiaga: I meant to be here at the beginning of Public Comment but was unable to break free. I appreciate the work of this Council and Member Brancamp keeps me informed as my designee here. Beth Wells has come to me on behalf of the STEM Coalition. I do appreciate the work you are doing and while we have a number of councils and committees in the Department, I do follow what you are engaged in. I also wanted you to know that we are in the process right now of preparing budgets and appreciate the work around technology planning, and around professional development in mathematics, or in the new science standards. I have lots of recommendations on how the state can improve service delivery in those categories. While that process is not finalized until the end of the year, I have been in a good position, thanks to information from folks in your sectors to try and inform not just the Departments budget, but the administration in general. I know Director Perea is a member and we work closely with Department of Employment, Training, and Rehabilitation (DETR), the System of Higher Education, and STEM related issues around our workforce are increasingly on our minds; whether at the Governor's cabinet, or at Budget. Take some solace that your work is also part of that larger piece. Finally, I always allow an opportunity for people to play stump the Superintendent on question that people want to know what it is I do all day, or at what level of implementation we are on assessments, standards, or accountability measures. If you have any questions, I am happy to answer them, or you can get on with your meeting.

Co-Chair Dave Brancamp: There are no questions in the North.

Co-Chair Mar Pike: Thank you Superintendent Erquiaga. It is always a pleasure to hear you speak. There are no questions from the South. But we do greatly appreciate you being here.

State Superintendent Dale Erquiaga: Thank you very much, and thank you for your work.

Co-Chair Dave Brancamp: Thank you

Co-Chair Mary Pike: Back to Member Brune I think we already figured this out but I will have her speak about the first implementation plan about sending it out kind of as a pilot.

Nancy Brune: We can talk a little more about how we would send it out as a pilot. But I think we had spoken in the Sub-Committee about the larger disseminations. I will inform the rest of the Council on our ideas of dissemination and maybe raise some questions on how that might proceed and invite discussion. I am handing this over to Member Harper to raise questions, and throw out some initial details with our thinking on how we would disseminate the survey

Wesley Harper: As we talked in the Sub-Committee, based upon our mandate, we should be surveying the country. The mandate asked us to see what are the STEM programs in this State and other States.

I think that is great. The implementation of that, and the scale of that looks like in Nevada about 22,000 teachers, in the country we have 3.2 million teachers. If we get responses back from 10% of those that we survey we will have a lot of numbers to analyze. Then we need to ask how do we get those surveys to the people who can answer them? I think within the State we have good systems to do that with no worry there. But how do we get New Mexico to respond, or Maine to respond, or Florida to respond? How are we going to do that?

There are ways to get it done that will take resources and some effort. In Nevada there is one of the leading national firms that do this just kind of thing. These are a firm that is here that looks capable to get this distributed, and provide the analysis from the prescription we give them. Whether you want to know how what the 3rd grade teachers think, vs how the 6th grade teachers think. This firm seems capable of doing it. They are very sophisticated. I haven't contacted them to see what it actually means in terms of time and money to be the implementer, and I don't know their process. In the private sector you can hire whoever you want. As this is Government, I don't know the implications of bringing on a firm.

Co-Chair Mar Pike: Any other discussion in the South?

Carl Reiber: In the interest in time and effort and potentially being overwhelmed by data, would it be better to do a targeted approach. Pick states we aspire to, or states that have known best practices in STEM education?

Wesley Harper: Yes theoretically, and this goes back to my initial thinking on how we are doing on STEM, what states are doing well. It is tough to say, there really is no standards measurement. We can decide whether we do 12 states or 6 states, and practicall speaking we can do Nevada. We could do Nevada, and crunch that data ourselves, with the promise to work on the larger national initiative separately. That is a practical path to follow. If we are going to go all out, we can look to see what all out looks like to see if we have the appetite to do it.

Nancy Brune: Being short of having funds to support contracting with a private firm, we thought there were a couple of options to use to disseminate the survey. One was the State Superintendent Council. We thought we could send it out to all the State Superintendents to get it disseminated. And then ask them to send it to all their Principals and Teachers. We may not get 10% of 3 million, but we would probably have a pretty nice sample size with some variation across states. This is another option without having resources to hire a professional firm. There are sort of professional associations. We thought we could send a letter from Superintendent Erquiaga encouraging people, and thanking people to take the survey.

Wesley Harper: Yes, we can do that. I have had conversations with the Superintendent on other matters within this realm on how to communicate with officials from other states. He has indicated that he would be cooperative. These things take time. We need to indicate which path we want to take, if we want to take a path at this time. If we don't the Sub-Committee can investigate on what each of the options are and move forward with whatever we think is going to give us our best return given our resources, time, and money.

Dennis Perea: This seems to be state initiatives and there seems to be at least three or four agencies interested. A lot of the time these can end up in tri-party agreements and the cost can be spread. Being the money guy I would like to see what that number is, but it seems to me that would be a logical solution so nobody takes an overly sizable hit.

Co-Chair Mary Pike: I think we should just send out to the pilot schools, and get those results back for the October meeting and we will have more discussion. Then in October whatever modifications we make that is fine, but I think we need jump on it immediately and send it out to at least the Superintendents of the counties in Nevada. Concentrate on Nevada first. Member Brancamp jump in on this so the first report we have for the Governor deals strictly with Nevada. After that we can send it out to the states and then eventually have another report on what is going on in other states. We do know there are some powerful STEM places in Ohio and that is one of the leads, along with four or five other states. I do agree since we are concentrating on Nevada, maybe that would be our first bet to get results back from Nevada first and do an analysis. I know it will be a Survey Monkey sent out in Clark County School District. We will need some assistance filtering those out anyway. And we will see how many results we get back from Nevada.

Carl Reiber: I agree with the strategy of Nevada first. We live in the age of surveys, and other states and some of these major centers for STEM education. Have we looked to see if they have surveyed? Maybe we can link ours or at least look at their results and see if in some way they match what we are doing so maybe we don't have to send a national survey out. We can compare ours to other national STEM surveys.

Co-Chair Mary Pike: We have found some reports of some national surveys, and have some analysis of national STEM surveys. They are not broken down by state, but we do have some of that available.

Co-Chair Dave Brancamp: I agree with the idea of let's just go with Nevada. We also have those three, four or five states that we are aware of that we can send to their Departments and get at least surface level data pieces that we could add. We are in the process of looking at other states but still need more time to get to it and we could at least note that in the report that we have a state department level, or if you have contacts, we have at least that information from states.

Co-Chair Mary Pike: I am not sure if this just captures STEM. But I know there are State Science Supervisors that Andre DeLeon from the Nevada Department of Education is a part of that, and is another way of dissemination. Of course we are very close with the State Department of Washington, because she used to work for Clark County School District, and would be willing to disseminate it in her state. The key will be to get it to the Districts and see if they will send it out.

Co-Chair Dave Brancamp: Tracy Gruber from the Nevada Department of Education can also send it out to all the math supervisors as well.

Co-Chair Mary Pike: Thank you Member Brancamp, and no we have not forgotten about you Tracy Gruber.

Tracy Gruber: Thank you.

Co-Chair Mary Pike: Any other comments from the South? Member Brancamp should vote on the dissemination piece for the pilot? What do you think we should do, do we need a motion here?

Co-Chair Dave Brancamp: It would be a good idea to have a motion of at least the pilot on the table so we know that is in the process.

Co-Chair Mary Pike: Is there a motion for the dissemination of the survey?

Anne Grisham: I move that we pilot the survey to the different schools that we talked about.

Nancy Brune: Can I add industry partners, and/or particular industries?

Anne Grisham: I agree.

Theresa Corey: I second it.

Co-Chair Mary Pike: So the motion as I understand it is to pilot the schools we already discussed, with some business partners and higher Ed? We included Dr. Reiber. All were in favor. That does pass so we will get the survey done and get that sent out. At time should we take a 10 minute break?

Co-Chair Dave Brancamp: that would work up here.

Break: 12:05 pm

Co-Chair Mary Pike: Please note that Dr. Brune is here. When we took role she was not but did arrive shortly after.

Nancy Martineau: I noted it when she arrived.

Co-Chair Mary Pike: I figured you did, you are always on it.

Nancy Martineau: Thank you.

Co-Chair Mary Pike: I call the meeting back to order. We are back on agenda item #5. I am going to introduce Sharon Pearson to discuss her Sub-Committees work.

Sharon Pearson: Yes we gave ourselves a name and it is "The Committee for Recognition of STEM Schools and Students."

We have a lot to repost this time. First with the Nevada STEM Implementation Framework as our basis. And as the other committee did we reached out to other states to see what form of recognition they have given. We melded all those together and gave up with the *Nevada STEM Program Recognition Rubric K-12*.

There are two changes right there we came up with from our original focus. Instead of STEM School Recognition, we called it a STEM Program. Because we have so many schools, especially in the South that focus on different areas within their school. We wouldn't want one to be excluded from STEM recognition if was also focusing on something else.

We also started out as K-5, 6-8, 9-12. As we started building we thought maybe we don't need to separate it out, because we all have the same goals. We look at it a bit differently in elementary than we do in high school, but those same goals are there. Richard Knoeppel will assist in the presentation.

There is so much to go over that I won't read it all to you. We will just look over the different categories and explanations of them. Looking across the top there are four categories that we would rate them.

The very first column before these four is Attribute.

- Exploratory – The Exploratory STEM program describes a school program that has intermittent STEM related opportunities for students.

- Developing – The Developing STEM program describes a program that provides STEM related experiences for students specific classes or instructional settings as a part of the daily schedule

- Established – The Established STEM program describes a school where STEM related experiences are provided for ALL students in the program in many instructional settings as a part of the daily schedule.

- Model – The Model STEM program describes a school where STEM related experiences are provide for ALL students within the program and are integrated in all instructional settings throughout the school day. This may be realized through a non-traditional daily schedule.

There are five categories along the left side.

- Curriculum Practices

- Curriculum

- Integration

- Learning Environment

- STEM Instruction.

Co-Chair Mary Pike: Nancy we lost two members after the break. Member Perea, and Member Young. If we continue this discussion we will lose more members. We do want this perfect, we don't want to rush. Any comments?

Co-Chair Dave Brancamp: If Sharon can give everyone a deadline she wants feedback from our council and then if we were able to have the document so it is on record. Then Nancy can send it to everyone two weeks prior to the October meetings to review. Then we could come in with any last minute pieces and run through it quickly for a vote.

**At this point in the meeting we spent over an hour of time going back and forth on what and how things should be changed within the Nevada STEM Program Recognition

Rubric. The Council did not come to any solutions within this time and agreed that the Council agreed to send Sharon Pearson their comments and ideas by August 20th and the Sub-Committee will review and rework the rubric taking into consideration all the suggestions. The members tabled this discussion until the October meeting.

Sharon Pearson: We did the Student Recognition piece as well. And we would just like to have a quick we are on the right path, we are on the wrong path piece. Because one of our assignments is student recognition as well. We talked how students can get recognized with lots of different certificates in lots of ways. But we want it to be more meaningful for them where they can participate and show off their work. Please read statement we have on the recognition by August 20th so we can then move forward.

Co-Chair Mary Pike: That would be the one sheet of paper we received with a couple of paragraphs.

Co-Chair Dave Brancamp: I want to reiterate our thanks for the great work to Sharon and your committee. This is really hard work and a lot of word-smithing. We appreciate all your work.

Sharon Pearson: Thank you very much. I am very proud of the committee.

Co-Chair Mary Pike: Michael Mohar was unable to attend, but he did supply a document. Should we review it at this time?

Co-Chair Dave Brancamp: A couple members are missing from Michael's team. Tracy Gruber is there support. We will probably make the same recommendation you just heard. I will let Tracy give you dates and so on. Just so everyone knows that because this will go out as a Request for Information (RFI), if we can get feedback from council quickly we can still post the RFI out. And still no decision has been made from our group as to who is going to be representing. That will be up to Mary as we phase our motion here.

Tracy Gruber: Our Committee Chair Michael Mohar was unable to attend due to an unforeseen work situation. We have made copies for all of you as we just received this document this morning. I want to let you know at the last meeting we told the Council that our legal Attorney General (AG) was looking at the solicitation and making suggestions. There were some edits that can now be found within this document. We will send this out to the council with requested feedback. I am not sure, it is up to the council or not, whether we want the same time frame and timeline, or if we would like this feedback earlier. August 20th is the time we will pick for the feedback. Please send your feedback to Trach Gruber at tgruber@doe.nv.gov. This will be e-mail to you as well, and we will bring that forth to the October meeting. Any questions?

Anne Grisham: I am on the committee and this is the first time I have seen this document. Is this standard as to the type of thing you would ask for when asking for a

fiscal sponsor? I don't have this kind of experience as you a and Michael Mohar do. Do I need to pay that much attention to it at this time? I don't know how to address this.

Tracy Gruber: No, I have never seen a solicitation either. That is why wanted to make sure all the I's were dotted, T's were crossed. That is why we sent it to legal counsel to make sure it was correct. Because we are asking for a Request for Information with no fiscal note attached to it. So, pretty much is an unfunded request. We have not had the opportunity to that here at the Department of Education anytime that I have been here. That is why it is called a Solicitation rather than a Request for Information or Request for Proposal. So know that as you are looking at it, kind of look provide feedback for does it make sense, is it clear, is there anything that is confusing, or is there anything that needs clarifying? Knowing that legally, it needs all the letters of the law.

Co-Chair Mary Pike: Thank you for that clarification. I have only been involved in RFI's and not anything that is a non-paid. Any questions in the South? Member Brancamp any in the North?

Co-Chair Brancamp: If we can get those to Tracy by August 20th. Our question to the Council is do we need to see this one more time in October before it goes out to just request this information or is the Council comfortable with the document that allows the Sub-Committee to send this forth, and at the October meeting they can have people present to us so we can start moving forth to make a decision. Knowing that we have an October meeting, and a January meeting sitting in front of us, this is not in the report we have to have, but I am sure we have to say what our process is by January 31st, how we are trying to find our fiscal agent. It will hold up that great work we have on the rubric until we have something in play. What we are asking for is someone to help us find grants and to operate that money side of this for us.

Co-Chair Mary Pike: I agree, if we give any feedback as to the content, the wording by August 20th with the thought that as long as legal approves of it that it just goes out. We need to move forward. We can't put this off. This is a really important piece because we need help. We are a small council and only meet four times a year. June 2016 we are done and we are going to need assistance. Any other comments in the South? Member Brancamp do we need to have a motion?

Co-Chair Dave Brancamp: In a motion that in finance of your Sub-Committee would move this forth once we have corrections to an RFI only, we would be safe.

Co-Chair Mary Pike: Is there a motion to carry this forward as possible solicitation or an RFI?

Anne Grisham: I move to carry this forward.

Theresa Corey: I second the motion.

Co-Chair Mary Pike: Is that enough for the record Member Brancamp?

Co-Chair Dave Brancamp: It is.

Co-Chair Mary Pike: All were in favor of the emotion. Motion carries.

Co-Chair Dave Brancamp: I believe that concludes #5.

Co-Chair Mary Pike: Yes, it does.

- ***(6) Potential Nevada Legislative STEM Related Bill Draft Request (BDR)(Beth Wells, Executive Director of Nevada STEM Coalition):***

David Brancamp: It is my pleasure to introduce Beth Wells who we have all heard from before previously. Thank you to Dr. Brune as she made a suggestion that there may be some Bills concerning our information around STEM as they start in Legislative session 2015. With that in mind we reached out to Beth Wells and her STEM Coalition for some ideas. Let me start out first off apologizing, Beth has been here since a little after 9:00 am through all of this, so we thank you for your patience with us.

Beth Wells: Thank you; I am the Executive Director of the STEM Coalition. Just a quick thank you to the Chairs, and all the Council Members. You have really taken this seriously with thoughtful and careful attention. It will pay off in the future. We are thrilled to watch the progress of this and I know sometimes you have all been frustrated with the restraints you have, but we appreciate your perseverance.

I am going to give recommendations that have come from the Board of Directors of the Nevada STEM Coalition. These are not necessarily Board of Directors Recommendation (BDR) recommendations. In looking at the political system in Nevada, and I realize that you had to be coming at the conversations from many different angles. You had to be talking to the Executive Branch; you needed to be talking to Legislative Branch; you needed to be talking to the Nevada Department of Education. Making sure that all parties were aware of what you were doing. I learned my lesson last time walking into the Governor's office with the BDR and being told no republicans on there, so we want to be a lot more thoughtful this time. I have five sets of recommendations and we have decided to go for the bold in this legislative session.

- A: The Nevada STEM Coalition recommends a 5 million dollar investment for professional development in science with a STEM emphasis. However, we want to make sure that application of math learned in the mathematics classes is a very important part of those STEM practices. We really want the State to pay attention to the fact that best practices in in incorporating math in STEM is a thoughtful process as well. It is not just giving kids charts to read and a few graphs to look at, but there really is an important integral piece of mathematics in STEM.

B: The Coalition requests that the Superintendent and the Governor to ask the community, and corporations to match the 5 million dollar allocation with possibly up to 2 million dollars. We are not coming up with recommendations for where that money would go, but it certainly could be applied to the supplies and materials necessary for a STEM based science and mathematics instruction. It could even be counted as in-kind from a corporation. Either helping with STEM fairs, because what I heard today is you can't always get kids into mentorships, but corporations can help get our kids learning more about the job opportunities.

- Teacher licensure upgrades. The Nevada STEM Coalition Board of Directors recommends that the State initiate a review, and possible upgrades for the K-8 teacher licensure. Superintendent Erquiaga already told me he is in the process of looking at this as well. We just want to go on record that we strongly support that process. The coalition does recognize that increased requirements or changes to licensure can impact college requirements, and cause a domino effect. Nevada currently has a very low national rating in its teacher preparation. This significantly impacts our student performance. We believe that it is a really important process and that all parties need to work together to resolve those issues.

- Classroom time for K-6 science. Recent reports from the National Association of Educational Progress, demonstrate that Nevada's elementary students receive less time in science per week than the national average. Therefore, the STEM Coalition Board of Directors recommends that the State initiate of the Star School Rating System to determine how time is spent on science. K-6 and science scores may be incorporated in school evaluations. And we understand from Superintendent Erquiaga that this investigation is already in progress as well. So we heartily endorse that process.

- Raising the bar in science and STEM instruction statewide. The Nevada STEM Coalition Board of Directors suggests a 2 million dollar state investment, with a 1 million dollar corporate match for a state level competitive grants program for grades 3-12 and possible higher education as well. Although, I believe BDR's will come out for higher education. For scaling up quality STEM programs and disseminating results statewide. This certainly would fit in with some of the STEM Advisory Council objectives as well.

- Building community and corporate support for STEM Education to build our workforce. Basically, we know a bully pulpit can be a very powerful tool in any state. The Nevada Coalition Board of Directors requests the Superintendent of Public Instruction and the Governor Sandoval publically support STEM education beginning in pre-K as one of the primary paths to building an adequate skilled workforce for Nevada's economy.

Last, the Nevada STEM Coalition may be requesting 2 years of State support to build a really robust STEM network of corporate and community partners, and volunteers to link

STEM educators through networking and directories. Which we are already doing, but we certainly need more support to ramp that up. Conduct annual statewide STEM Summit to share positive news about STEM educators statewide. In other words, disseminating those best practices, and identifying some of those best practices, and making sure those are distributed around the state so that educators are aware of it.

Co-Chair Dave Brancamp: Thank you Beth, we really appreciate your time. I was very fortunate to be with Beth Wells when she met with our State Superintendent and he is extremely excited as you saw he stopped his day to come in and talk to us. He backs our work, and we appreciate that. Member Pike, any questions from the South?

Co-Chair Mary Pike: thank you Beth Wells and we love the recommendations. Any questions or comments from the South?

Theresa Corey: I was wondering, you mentioned teacher licensure K-8 but you didn't say what you wanted to happen with that, can you please explain.

Beth Wells: What we hear from Stakeholder, Educators, Grassroots Educators, is that teachers can get a K-8 license with very little science and math content classes required. They can get their strategy classes but they don't really the science and math, particularly at the middle school level. That is what we hear grassroots. There are a lot of national reports. Change the Equations has looked at our reports, and we don't stack up well in what we require our teachers to have completed to get a license at that level.

Co-Chair Mary Pike: Thank you Beth Wells. Any other comments or questions in the South?

Anne Grisham: Beth I love every single one of those ideas. All I can say is "Go Beth Go!" I think it's fantastic.

Beth Wells: I say the same to all of you. Because this process has been such a joy to watch how many hard working people in the state are not getting recognition. Thank you again.

Co-Chair Mary Pike: No more comments or questions in the South.

Shelace Shoemaker: Member Brancamp had to step out for a minute, but said we are free to go on to the next agenda item.

Co-Chair Mary Pike: Again, Beth Wells thank you for that presentation. We can now move on to agenda item 7.

- ***(7) Additional Opportunities for STEM Advisory Council to learn about STEM activities in Nevada (Co-Chairs David Brancamp and Mary Pike):***

Co-Chair Mary Pike: The only one I am aware of is the one we spoke of earlier today about the Nevada 150 Event, which is the manufacturing event on October 1-3, 2014. I am hoping we can get some more information on that and that some of you can participate. Part of it is open to the public, and that might be a good idea. Other than that, is anyone aware of any other STEM events coming up throughout the state that might be good for our committees or council members to participate?

Carl Reiber: I can send information to the Council that UNLV will be holding its Annual STEM Summit. We are choosing dates now that will be in January.

Co-Chair Mary Pike: Thank you Dr. Reiber that was a great Summit last year so I hope we can all attend. Any other events that anyone is aware of at this time? I know many of you are getting ready to go back to school. Most seem to be in the winter or spring. Member Shoemaker do you have any suggestions.

Shelace Shoemaker: We have an Annual STEM Mini Conference that Beth Wells is a part of and Dr. Crowther from UNR on November 8, 2014, and if you have any proposals for this they are due October 1, 2014.

Co-Chair Mary Pike: Is that the Nevada State Science Teachers Association STEM (NSTA) Conference?

Shelace Shoemaker: I am not sure. The e-mail just says STEM Mini Conference.

Co-Chair Mary Pike: Thank you. I will verify that, I believe that is in association with the NSTA. I believe Dr. Crowther is the president. We will find out more information and send that out. Are there any other items?

Co-Chair Dave Brancamp: Thank you for covering while I was gone. A couple of things we received from the Nevada Business Aviation Association that there was a national STEM competition in which there is a team from Sunrise Mountain High School, Las Vegas attended, congratulations to them. I want to thank Member Shoemaker for letting us come to their school. At the end of this last year they had a whole STEM day with people from different areas of STEM in the Community there with their kids. It was incredible to watch their faces as these kids watched people from Aviation, to the Fire Department and so on talk about their careers and how it is related to STEM.

Co-Chair Mar Pike: One more thing about the Investing in Innovations Grant that Clark County School District was awarded. We just finished up year one and will have some data coming up. We do have the Project Lead the Way NGGT Program which is in engineering for middle schools. However, we are moving those up into high school to Mojave High School, and Western High School will be miso-medical. We will collect some data. Core training is going on right now at UNLV. UNLV is now a Project Lead the Way Affiliate in partnership with the School District. We are hoping for some good data, and we have given assessments of grades 6, 7, and 8. We had a STEM camp for 200 students for 10 days, and did robotics, coding, and hydroponics. Three Square

provide breakfast and lunch for those 10 days for the kids. Those were kids from Garside, Gibson, Finley, and Johnston which were lower social economic schools, high ELL populations, and high special education populations. In our minds even if test scores don't increase we do see movement on the STEM survey and interest in STEM careers. Which is more important to get them into those programs in high school. We have a year and a half left and hopefully we will have some good progress.

No more comments from the South.

Co-Chair Dave Brancamp: None from the North.

- ***(8) Future Meeting Date and Agenda Items (Co-Chair Mary Pike):***

Co-Chair Mary Pike: Member Brancamp should we move on to the agenda items first? We do know we are going to have to bring back the information for the STEM Committee who did the rubric back for a final vote. We will also bring back the results of the STEM Survey Pilot we are sending out. Any other agenda items?

Co-Chair Dave Brancamp: I know when we were discussing the survey, Dr. Brune, if there were questions or concerns of the STEM definition that the State uses we could put that on the agenda and have that discussion at our next meeting. Or if we need to let it sit that is fine. I just wanted to acknowledge that was in your document about using the council's definition and right now we are using the States.

Nancy Brune: I think we decided to let it sit, given our short schedule.

Co-Chair Brancamp: Then we will let that one sit. One other piece from the rubric; Member Pike you said there was someone from the public. I am not sure we want to capture their comment. I am not sure if they have left or would still like to have us hear their comment.

Co-Chair Mary Pike: Thank you, yes he is still here.

Co-Chair Dave Brancamp: No more agenda items from the North.

Co-Chair Mary Pike: Any other items in the South. I know we will also include what happened with legal on the solicitation, and this will be on the agenda as well.

Co-Chair Dave Brancamp: We will make sure that is one there.

Co-Chair Mary Pike: No other recommendations from the South.

Co-Chair Dave Brancamp: Should we have Nancy send a Doodle, or should we get our out calendars.

Co-Chair Mary Pike: The Doodle is what we would like. Just sooner than later, some of your member's calendars are already extremely full for October.

Anne Grisham: Both Member Pearson and I have a substantial date issue with October and that is October 22-24. As a STEM activity we take our fifth graders to the Grand Canyon. All of our fifth graders go, and because Sharon is so involved with the rubric wanted that noted. She has to go, it is not an option.

Co-Chair Dave Brancamp: I will ask that Nancy will send out a Doodle Poll for dates in October by tomorrow morning. And once a date is selected she will send the official meeting invitation.

- ***(9) Public Comments:***

Nathan Sala: Representing GOED from UNLV. Under STEM integration; under the last row, under model, it says "Students explain multiple solutions to community problems" and I thought that maybe real world would be better. You were having problems with the word community. So I thought real-world would be all encompassing.

Mary Pike: Thank you very much for your comment, and so noted we will take into consideration when we are re-doing it. We do have three other members from the public here, but none are getting up to make a comment.

Co-Chair Dave Brancamp: None from the North.

- ***(10) Meeting Adjournment:***

Mary Pike: We need a motion to adjourn the meeting.

Carl Reiber: Motioned to adjourn the meeting,

Anne Grisham: Seconded the motion.

Co-Chair Mary Pike: All are in favor. Thank you for a productive meeting.

Co-Chair Dave Brancamp: Thank you everybody.

Meeting adjourned at 2:06 pm.

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