

## MINUTES

### MATH AND SCIENCE EDUCATION ADVISORY COMMITTEE

October 31, 2007  
Room 123-S—Statehouse

#### Members Present

Senator Nick Jordan, Chairperson  
Senator Laura Kelly  
Senator Ruth Teichman  
Representative Shirley Palmer  
Representative Sheryl Spalding  
Representative Kenny Wilk  
Mitch Counce, General Manager, Servi-Tech, Dodge City  
Richard Taylor, Plumbers and Pipefitters Local Union 441, Wichita  
Paul Weida, Vice President, Black and Veatch Corp., Overland Park  
Kenneth Clouse, President, Northwest Kansas Technical College  
Dr. Michael Lane, President, Emporia State University  
Ms. Janis Lariviere, Center for Science Education, University of Kansas

#### Members Absent

Dan Jacobsen, President, AT&T, Topeka  
Dr. Edward Hammond, President, Fort Hays State University

#### Staff Present

Dale Dennis, Deputy Commissioner, Kansas State Department of Education  
Sharon Wenger, Kansas Legislative Research Department  
Michele Alishahi, Kansas Legislative Research Department  
Theresa Kiernan, Office of the Revisor of Statutes  
Matt Todd, Office of the Revisor of Statutes  
Rose Marie Glatt, Committee Assistant

#### Conferees

Dr. Ed Hammond (written only)  
Dr. Patricia All, Superintendent, Olathe School District  
Dr. Alison Banikowski, Associate Superintendent, Olathe School District  
Dr. Gretchen Sherk, Director of Career and Technical Education

Dr. Gwen Poss, Principal of Olathe Northwest High School  
Ms. Sue Rippe, Teacher and Facilitator of 21<sup>st</sup> Century High School Aerospace  
and Engineering Program, Olathe Northwest High School  
Tom Trigg, Superintendent of Blue Valley School District  
Verneda Edwards, Executive Director of Curriculum and Instruction, Blue Valley  
School District  
Marge Hill, Coordinating Teacher, Blue Valley School District  
Nicole Worley, Blue Valley School District  
Barb McAleer, Blue Valley School District  
Denise Wren, Assistant Superintendent for High Schools, Wichita School District  
Lori Doyle, Principal, Wichita West High School, Wichita School District  
Janis Lariviere, UKan Teach Math and Science Teacher Preparation Program  
John Yochelson, President, Building Engineering and Science Talent (BEST)

### **Morning Session**

The meeting was called to order at 10:00 a.m. by Senator Jordan, Chairperson of the Committee. He welcomed everyone to the second Math and Science Education Advisory Committee. Senator Jordan said Dr. Ed Hammond was not able to attend today's meeting; however, he had sent a memorandum which expressed his thoughts on problems, goals, and strategies for the Committee's consideration ([Attachment 1](#)).

Dr. Patricia All, Superintendent, Olathe School District, and the Olathe School District staff, gave a PowerPoint presentation on *Improving Achievement and Expanding Outcomes in Math and Science Begins with K-12*. Packets were distributed that included the PowerPoint presentation ([Attachment 2](#)), brochures, and a CD on the 21<sup>st</sup> Century High Schools' Program in the Olathe School District (on file in the Legislative Research Department). She said that Olathe is aware that good jobs are being outsourced to China and India, not simply because they work so cheaply, but because they are better educated in math and science skills that are required for 21<sup>st</sup> Century work. She said that the Olathe School District asked how they could:

- Encourage math and science advanced degree and careers;
- Close the math and science achievement gap;
- Increase access to advanced courses;
- Advance knowledge and skills of teaching professionals; and
- Recruit and retain talented math and science majors to the teaching profession.

Dr. Alison Banikowski, Associate Superintendent, Olathe School District, explained the plan is centered on the goal to improve all students' knowledge and skills in math and science. They want to increase achievement skills and create a passion for learning math and science.

The Olathe District's plan and actions include:

- Professional Development - Advancing teacher knowledge and skills by focusing on pedagogy and content, like-content sessions, in-classroom coaching, (enhanced by a Kauffman grant), and utilizing higher education partners.
- Elementary Focus - Math and science skills begin at the elementary level, and teachers must engage students and make teaching relevant to today. They use

a hands-on, minds-on approach and offer math and science clubs for after hour activities. They are increasing rigor through a pre-algebra program and instituted a curriculum change to ensure all students have had algebra by the 8<sup>th</sup> grade.

- Middle/Junior High Focus - Engagement of all students is accomplished through an inquiry-based approach, using hands-on classes and math and science clubs. Dr. Banikowski described the Jason Project which stresses the importance of relevance, (career exploration and planning) and rigor (math sequence curricula with extended learning for challenged learners) to the success of their programs.
- High School Focus - They are changing the way they teach by using competitive opportunities and an inquiry-based approach. They increased rigor with the addition of advanced placement (AP) courses and have taken a step beyond with their 21<sup>st</sup> Century Career and Technical High School Programs.

Dr. Gretchen Sherk, Director of Career and Technical Education, said that the 21<sup>st</sup> Century High School Program was initiated in 2002-2003. She said the program includes:

- Extensive research and best practices for high school education;
- Notations made on students' transcripts, indicating they have had a focused plan of study and experience throughout their high school career. It is an opportunity to acknowledge all the enhancement and out-of-classroom activities, in which the students participated during the summer, weekends, and evenings.
- Programs with ties to math and sciences, including e-Communication, sports medicine, and athletic training, business/entrepreneurship and enhancements to the career and technical programs. She explained CaSE (Computer assist Software Engineering), which is a new program which has generated much interest.

Dr. Gwen Poss, Principal of Olathe Northwest High School, said the Aerospace and Engineering (AE) Program has been in existence for five years and has exceeded capacity expectations the last three years. She said the beauty of the program is that the District has taken existing courses and focused them on an engineering-integrated curriculum that is meaningful, relevant, project-based, and real-world. She described various programs in which students have excelled. She said that AE is successful, as reflected in ACT data, and availability of scholarships.

Ms. Sue Rippe, teacher and facilitator of the 21<sup>st</sup> Century High School Aerospace and Engineering Program, Olathe Northwest High School, continued the discussion by explaining the many benefits of widespread business and educational partnerships, such as the increased number of scholarships, internships, mentoring programs, and use of the wind tunnel facility at Wichita State University.

Senator Jordan noted that Ms. Sue Rippe was a former Teacher of the Year in Kansas.

Dr. Patricia All returned to the podium to answer: What does it take to achieve our goal? She said if we wait until the high school level to develop students preparing for the workforce, it is too late, too inefficient, and too costly. Building on good solid elementary education, keeping students engaged and connected at the middle level is paramount to success at the high school level and will be accomplished by having multi-faceted targets, strategies, and aligned actions.

She said the challenges and opportunities facing education are many, including the following:

- Highly qualified teachers, with continued education, are essential. University partnerships, teachers with field experience, licensure issues, and the realization of competition with the “for profit” world also are important issues to study.
- Recognition and Rewards for students teachers – scholarships and sponsorships are essential. They must work toward keeping Kansas’ students in Kansas, by allegiance to companies that have supported them through higher education.
- Partnerships-externships, and mentors are needed to provide the expertise and direction.
- Clarity Needed – What are the skill demands of 21<sup>st</sup> century workforce? Businesses and education need to continue collaboration on future workforce needs.

Discussion followed regarding: demographics of students, the process of curriculum development, curriculum for average students, process of re-training teachers, sharing successful programs with other school districts, cost of programs, and businesses involved in programs.

Tom Trigg, Superintendent of Blue Valley School District, said that for programs to be successful, students must have a solid foundation that begins in pre-K through middle school. He described the importance of a strategic plan which calls for "unprecedented academic success and unparalleled personal growth for every student." There must be measurable targets to determine accountability of all those involved. Blue Valley School District builds its curriculum on four fundamental questions:

- What do we want students to know?
- How will we know if they know it?
- What will we do if they do not know it?
- What will we do if they already know it?

Verneda Edwards, Executive Director of Curriculum and Instruction, Blue Valley School District, said the District's program is focused on its successful middle school math program. She distributed a handout that gave an overview of the program, and work sheets from students ([Attachment 3](#)).

Marge Hill, Coordinating Teacher, Blue Valley School District, explained the Connected Math Project (CMP), a National Science Foundation Middle School Program, written for sixth through eighth grades. Blue Valley has adapted the program to begin in the fifth grade. She distributed a paperback book, known as a module, and said that there are eight modules for each grade level. The content in each module contains: number sense, algebra, geometry/measurement, and data. Each student completing the four years of CMP instruction will have learned content equivalent to Algebra I. She explained how the District provides professional development and ongoing teacher support.

Verneda Edwards, Executive Director of Curriculum and Instruction, returned to the podium to explain the trend data for 2000-2005 for students categorized as unsatisfactory, exemplary and proficient and above. She said the success of the program is due to: the District's school improvement initiative, teaching to the state standards, and the teaching materials they selected.

In the Spring of 2000, Blue Valley had no middle schools achieving Standard of Excellence; however, in the Spring of 2006, all eight of their middle schools achieved Standards of Excellence. She then explained the mathematics instruction continuum for the elementary, middle, and high schools.

Barb McAleer and Nicole Worley, Blue Valley Middle School teachers, said there was quite a difference in students moving from elementary to middle school since implementation of the CMP program. Ms. McAleer described how the teaching paradigm had changed from a lecture format to that of being a facilitator, which she learned at the University of Michigan. Ms. Worley described how the classroom structure changed with the new program. She spoke of the students' excitement in discovering math processes and answers from their conversation with peers. They gained parental support through a series of parent education nights and distribution of articles, such as *Never Say Anything A Kid Can Say!* ([Attachment 4](#)). Ms. McAleer and Ms. Worley summarized by saying that future plans include continuation and enhancement of the programs proven to be successful at Blue Valley School District.

Denise Wren, Assistant Superintendent for High Schools, Wichita School District, talked about the similarity in the Wichita programs to those of Olathe and Blue Valley. She provided an overview of that District's program ([Attachment 5](#)). In 2006, the District embarked on a multi-year high school reform initiative. Staff spent time listening and questioning students on why students were not interested in math and science. Staff heard over and over that math and science subjects were boring. The District has a three-pronged approach to bring about change:

- Find the students that have never been in High School math and science classes;
- Determine and implement programs to support them; and
- Change how they are teaching.

Lori Doyle, Principal, Wichita West High School, Wichita School District, explained the total enrollment and demographics of the district ([Attachment 6](#)). She said the District's mission is to provide each student with a safe learning environment and an equitable opportunity to develop competencies necessary to become a productive member of society. She described the Work Academies that provide the necessary foundation linking high school to postsecondary education such as: an apprenticeship program, technical college, or a four-year institution. The Academy Model provides the opportunity to customize programs to support student needs through personal adult advocate programs, tiered interventions, structured classes, and small learning communities. She said the Engineering Academy is based on the *Lead the Way* curriculum. It is a four-year sequence of courses which, when combined with traditional mathematics and science courses in high school, introduces students to the scope, rigor, and discipline of engineering prior to entering college. She gave examples of specific projects that have been done and noted the enthusiastic response from the business community. She described current programs that are being taught in the District's Health Academies. Quotes from participating students enrolled in the Academies were shared.

Denise Wren, Assistant Superintendent for High Schools, Wichita School District, returned to talk about innovative recruitment approaches currently utilized. She explained a score report based on preliminary ACT tests, and how it changes the direction of a student's studies ([Attachment 7](#)). She described the success and mission of the Advancement via Individual Determination (AVID) program which is to encourage the average student boosting them to the exemplary level. She distributed a memorandum on the AVID program ([Attachment 8](#)).

Discussion followed regarding how the innovative programs can be shared with other school districts, particularly those in rural areas. Senator Jordan invited educators to provide feedback to legislators in areas where improvements can be made.

## Afternoon Session

Janis Lariviere, UKan Teach Math and Science Teacher Preparation Program (UKanTeach), gave a PowerPoint presentation on the program at the University of Kansas ([Attachment 9](#)). She asked where are the future STEM leaders going to come from if our science education programs collapse. She reviewed data on the number of teachers leaving the field and retiring, and noted the decrease in the number of students entering the field.

UKan Teach is an example of the type of program that can be approved for implementation under the new Kansas licensure regulations for innovative and experimental licensure programs. Ms. Lariviere outlined keys to UKan Teach success:

- Four-year program – degree in math or science and a teaching license;
- Recruiting early and often:
  - Visits to KU math and science classes;
  - Letters to incoming freshman and transfer students; and
  - Emails to majors;
- Early Field Experience:
  - First UKan Teach Course: grades 3-6;
  - Second UKan Teach Course: grades 7-8; and
  - Subsequent courses: grades 9-12;
- Master teachers as faculty and advisors;
- Internships and scholarships;
- New professional development courses designed for future math and science teachers;
- Induction support for new teachers to help insure success; and
- Master's degree program encouraged soon after graduation.

Thirty KU math and science students completed the pilot section of the first UKanTeach course in the Spring of 2007. Thirty-nine students are enrolled in that same course this fall. Ms. Lariviere spoke briefly of the Middle School Science Academy (MSSA).

Ms. Lariviere recommended the following:

- Provide funding for innovative/experimental teacher preparation programs for areas with critical teacher shortages;
- Establish a P-20 Council to connect the Kansas State Department of Education and the State Board of Regents programming and facilitating the collection of longitudinal data to determine the efficacy of intervention strategies;
- Offer financial incentives to STEM teachers; and
- Allow teachers to retire and be rehired in shortage areas.

Dale Dennis, Deputy Commissioner, Kansas State Department of Education, said that there are approximately 30,000 people in Kansas who have current or expired teaching licenses. The list, taken from the Department of Education's database, was sent to all school districts. The schools made contact with licensees to inquire if there was interest in returning to teaching.

Discussion followed regarding funding needed to attract qualified STEM teachers to the education field. Ms. Lariviere explained that problems may arise from the discrepancy STEM teachers' salaries are raised above salaries of other teachers; however, she believes it is a matter of educating other teachers of the importance of such an initiative.

John Yochelson, President, Building Engineering and Science Talent (BEST), reviewed a preliminary draft of Kansas Math/Science/Innovation Data Book (Attachment 10). He said his assignment, made possible by the Kaufman Foundation, is to produce a clear, accessible data book. The book will provide a view of what the math/science innovation picture looks like in Kansas and will be available to legislators, concerned educators, concerned employers, foundations, and others. Due to time constraints the book will not have original research, but be an integration of valuable information that already exists in the state. After the first September meeting, he made contact with Deputy Commissioner Dennis, and Vice President Diane Duffy, from the Board of Regents, who provided extensive collaboration.

He reviewed the draft copy of the data book, that includes 62 points. It is organized into five sections:

- Why Math, Science, and Innovation Matter for the U.S.?
- Why Math, Science, and Innovation Matter for Kansas?
- What are the Indicators for K-12?
- What about the K-12 and Higher Education Math-Science Teacher Corps?
- What about Postsecondary Indicators?

He said that at the September meeting, Dr. Reginald Robinson, Kansas Board of Regents, had referred to an *Alignment Study Post-Secondary to the Workplace*. That study has been released and identifies five sectors where Kansas will have a competitive advantage: Advance Manufacturing/Aviation, Bio-Sciences, Communications, Extractive and Renewable Energy, and Health. A portion of this report, relevant to math and science issues, will be included in the data book.

Mr. Yochelson visited with faculty and department heads at Kansas University and Kansas State University. Representative Wilk recommended a resource article from the *Cleveland Federal*

*Reserve*. It is a study to determine why some states have had economic growth, while others did not, and describes the U.S. from 1920 to 2005. He agreed to provide that resource to Mr. Yochelson. Discussion followed regarding the inclusion of data from Washburn University, importance of international students, and demographic issues.

Members of the Task Force questioned the following points in the draft data book:

- Regarding an integrated data system, Mr. Dennis confirmed that the program is not connected to postsecondary education data at this time; and
- Pittsburg State University should be listed for engineering degree production. Mr. Yochelson agreed to verify that information.

In response to a question on the timeline for his report, Mr. Yochelson said it was his intent to send an electronic copy to Advisory Committee members a week before the November 26 meeting. In conclusion, Mr. Yochelson thanked the Committee members for their cooperation, then introduced Mike English, from the Kaufman Foundation, who is assisting in the data book development.

Senator Jordan asked if there were suggestions for future speakers or topics. There was a suggestion that representatives from rural or small communities should be invited to address their issues and challenges. A second suggestion was representatives from small communities that have incorporated teaching with technology be invited to speak. There was interest in hearing more about the experimental programs in Kansas and how businesses look at the educational system for training the future workforce.

*Dr. Michael Lane moved that minutes from September 26, 2007, be approved, seconded by Representative Wilk. The motion carried.*

The meeting was adjourned at 3:20 p.m. The next meeting is November 26 and 27, 2007.

Prepared by Rose Marie Glatt  
Edited by Sharon Wenger

Approved by Committee on:

November 26, 2007

(Date)