

## Summary Report Industry Advisory Councils

Meeting held in Jefferson City, Missouri  
January 25, 2007

A number of provisions of the Carl D. Perkins Career and Technical Education Improvement Act of 2006 directs states to connect their career education programs and use of funds with labor market needs. The Act, which provides more than \$1.2 billion in federal aid to the states through 2012, places more emphasis on preparing students for high-skill, high-wage, or high-demand occupations, as well as entrepreneurship and small business development. The Act also provides a welcomed stimulus for the educational system to create stronger partnerships with industry, economic and workforce development, and local employer leaders.

In 2007, the Department of Elementary and Secondary Education, Division of Career Education, is convening industry and education advisory councils for each of the 16 national career clusters. The purpose of each council is to review and confirm the knowledge and skill statements for the programs of study for the 16 broad clusters of occupations and the 81 career pathways. Missouri educators will then work to achieve alignment of courses for each program of study and seek review and feedback from their respective industry advisory council.

The career cluster framework provides the opportunity for students to become aware of, explore, and develop an educational plan for the variety of career and educational opportunities that will be available to them.

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|---|--|
| ▶ Agriculture, Food & Natural Resources | ▶ Hospitality & Tourism                          |
| ▶ Architecture and Construction         | ▶ Human Services                                 |
| ▶ Arts, AV Technology & Communication   | ▶ Information Technology                         |
| ▶ Business, Management & Administration | ▶ Law, Public Safety, Corrections & Security     |
| ▶ Education & Training                  | ▶ Manufacturing                                  |
| ▶ Finance                               | ▶ Marketing, Sales & Service                     |
| ▶ Government & Public Administration    | ▶ Transportation, Distribution & Logistics       |
| ▶ Health Sciences                       | ▶ Science, Technology, Engineering & Mathematics |
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### Online Survey of Missouri Business and Industry

To begin this important state-level review and confirmation of the knowledge and skills statements which were developed nationally within the career cluster framework, the DESE Division of Career Education conducted an online survey of Missouri employers and professionals to validate knowledge and skills needed by students pursuing careers within their chosen career path, cluster, or field. More than 700 individuals participated in the statewide survey.

Organized by career clusters and their respective career fields, the online survey was conducted from November 20, 2006 through January 8, 2007. Leaders of professional and trade organizations and employer groups across the state were invited to participate. In this way, Missouri Career Education asked employers and industry across the state to:

- Rank in importance the foundation knowledge and skills for their career cluster, as well as identify any gaps or emerging areas;

- Rank in importance the knowledge and skills needed for the various career pathways in which they employ, supervise, or work;
- Identify any gaps or emerging areas that are essential to the pathway and need to be addressed by career education;
- Indicate whether they work in business/industry, for a state or federal agency, in education, an association, or other;
- Provide any additional comments or information they may like to share to help improve the quality of workers they receive; and
- Possibly volunteer to participate in future surveys and/or to serve on a statewide or local industry advisory council.

Results of the 16 career cluster surveys of Missouri industry and business are available for viewing and printing at [http://www.dese.mo.gov/divcareered/career\\_clusters.htm](http://www.dese.mo.gov/divcareered/career_clusters.htm)

### **Industry Advisory Councils Convened**

The department career cluster leaders invited industry representatives to participate in a face-to-face meeting held in Jefferson City on January 25, 2007. At least one representative for each career pathway within each career cluster were identified and invited to participate. Following a morning introductory session by Dr. Ann Benson, consultant, more than 80 business and industry representatives reviewed the academic and technical skills needed by students in the workplace after considering feedback from the statewide survey. They responded to the following questions:

*Foundation Knowledge and Skills:*

- Which do we not need in Missouri?
- Which knowledge and skills are missing?
- Which grade level should each be taught?

*Pathway Knowledge and Skills:*

- Which do we not need in Missouri?
- Which knowledge and skills are missing?
- Which grade level should each be taught?

*Credentials/Certifications:*

- What are the major certifications/credentials that we might work toward?
- Verify and rank current industry credentials
- Explore any new or emerging credentials
- Consider how non-credentialed fields of study should be credentialed in Missouri

*Closing Questions:*

- What advice or insight would you give to a student considering a career in your industry?
- How can education and industry partner to better prepare Missouri students for this industry?
- What are the strengths of your industry?
- What are the challenges facing your industry?
- What trends are emerging in this industry?

The following pages contain summaries of the discussion and feedback collected during the January 25 Industry Advisory Council meeting in Jefferson City, Missouri. This input from industry will be important as educators review knowledge and skills statements, align courses, and develop programs of study that will prepare students with the knowledge and skills needed for successful careers.



## Agriculture Food and Natural Resources

In attendance were Dawn Thurgau, Beef Industry Council; Jeff Case, FCS Financial; Dennis Potter, State Soil; Scientist; Richard Roller, Seitz Foods; and Terry Heiman and Darrell Martin, DESE.

### **Foundation Knowledge and Skills**

The academic foundations were all viewed as highly important.

The highest priority items were:

- Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information within AFNR
- Solve problems using critical thinking skills independently and in teams
- Understand roles within teams, work units, departments, organizations, inter-organizational systems and the larger environment.
- Use leadership skills in collaborating with others to accomplish organizational goals and objectives.
- Know and understand the importance of professional ethics and legal responsibilities
- Demonstrate workplace ethics specific to AFNR occupations.

### **Pathway Knowledge and Skills**

All items were validated as very important.

Most critical items are listed below.

*Food Products and Processing Systems* – see page 5 of the survey to see all the items

- Identify processing, handling, and storage factors to show how they impact product quality and safety.
- Plan, implement, manage, and/or provide services for the preservation and packaging of food and food products.

*Plant Systems* – see page 6 of the survey to see all the items

- Apply principles of anatomy and physiology to produce and manage plants in both a domesticated and a natural environment.
- Apply fundamentals of production and harvesting to produce plants.
- Exercise elements of design to enhance an environment (e.g., floral, forest, landscape, farm).
- Address taxonomic or other classifications to explain basic plant anatomy and physiology.

*Animal Systems* – see page 8 of the survey to see all the items

- Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.
- Provide proper nutrition to maintain animal performance.
- Identify environmental factors that affect an animal's performance.
- Recognize animal behaviors to facilitate working with animals safely.
- Know the factors that influence an animal's reproductive cycle to explain species response.
- Missing items noted were:
  - Marketing (know the customer)
  - Product Utilization (waste management)

*Power, Structural and Technical System* – see page 10 of the survey to see all the items

- Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- Develop skills required to use construction/fabrication equipment and tools.
- Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- Examine structural requirements to estimate project costs.
- Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- Exercise basic skills in blueprint and design development to create sketches, drawings and plans.
- Read and relate structural plans to specifications and building codes.



*Natural Resources Systems* – see page 12 of the survey to see all the items

- Recognize importance of resource and human interrelations to conduct management activities in natural habitats.
- Use effective venues to communicate natural phenomena to the public.
- Employ knowledge of natural resource industries to describe production practices and processing procedures.
- Apply scientific principles to natural resource management activities.
- Practice responsible conduct to protect natural resources.

*Environmental Service Systems* – see page 14 of the survey to see all the items

- Apply scientific principles to environmental services.
- Use tools, equipment, machinery and technology to accomplish tasks in environmental services.

*Agribusiness System* – see page 15 of the survey to see all the items

- Apply generally accepted accounting principles and skills to manage budget, credit, and optimal application of AFNR business assets.
- Practice good record keeping to accomplish AFNR business objectives.
- Use sales and marketing principles to accomplish an AFNR business objective.
- Employ AFNR industry concepts and practices to manage inventory.
- Utilize technology to accomplish AFNR business objective.

The survey instrument prevented results to be posted in this category. The Council rated all items as very important and rank ordered the items.

*General Comments*

- Technology should be at the front under general, it is important in all areas.
- Marketing and communication are used the same.
- Observation skills need to be in the overall competencies.
- Important to tell students why it is important to them.

**Sample Plan of Study**

The general format was viewed positively. Comments were:

- 9<sup>th</sup> grade – Introduction to Agriculture, food and natural resources course should be considered.
- One or Two entry level courses were discussed.
- To give students what they need, they should take math and science each year.
- Hard to take career ed courses with all other requirements and also be in fine arts and athletics. (Band, PE, Sports)
- Need to inform counselors about what students need.
- Comprehensive High school is where Ag program needs to be.
- Likes Cluster, MU has improved programs to make more pathways for students.
- Counselors need to be instructed on how to channel students.
- Getting students out to see how it is working will influence students more than sitting in a classroom.
- How will all this affects the test scores is important.

**Credential and Certifications**

Ag professionals need to inform students and provide information on how to get certifications.

There are things already there that we need to tie into.

- A.I
- Private Chemical Applicator License
- Food Safety - Serve Safe
- Certified Crop Advisor
- On site for Waste disposal
- PQA
- Hunter Safety
- First Aid



*What do we do to make Certification & License more valuable?*

Cooperate with industry to help with this Certification & License process.

Possibilities are:

- Machinery Operators – tractor, forklift
- Well – core sample
- Power Saw Operator
- Safety
- GIS Mapping
- Stream Teams Course

***What advice or insights would you give to a student considering a career in your industry?***

- Get involved in FFA
- Be informed of options and opportunities.
- Encourage as much training as possible in their lifetimes. Never can get too much information.
- Focus in all three areas – FFA, Leadership, SAE and classroom
- Network
- Employability skills
- Pay attention to detail.

***How can education and industry partner to better prepare Missouri students for this industry?***

- Two way street – both sides must provide something –
- AgEd – skills needed for employment
  - o Industry – Forms of Certification & License that students need or can get.
- Let industry in to school to teach, and job shadowing.
- Take students out to work one-on-one with industry. See what it is all about.
- Partnership – Networking
- People in industry are willing to help but need to see results.



## Architecture and Construction

In attendance were: Robert J. Behlman, Behlman Builders; Erin Boatright, Kansas City Power and Light; Ronald W. Wiese, Aberici Contractors; Chris Yarnell, PE, Jefferson Asphalt Co.; Nathan Wittmaier, Missouri Center for Career Education; and Gavin Allan, DESE.

Business and industry representatives for the Architecture and Construction Career Cluster further reviewed and validated the Architecture and Construction Knowledge and Skills Statements during the industry review meeting on January 25, 2007. The introductory comments by Ann Benson of Oklahoma spurred strong discussion and thought by the cluster industry advisory members regarding the general direction of education in Missouri and the United States, the preparation of recent graduates for the workforce, and the skills needed to succeed in the Architecture and Construction workforce.

While much of the discussion focused on the general skills needed for success in the workplace, the committee's review of the cluster knowledge and skills statements reinforced the validity of most of the statements and noted out some potential gaps. Five advisory members attended the January 25 meeting. The November survey had 73 respondents. Advisors present at the January 25 meeting found that reviewing the knowledge and skill statements in light of their performance elements and measurement criteria was particularly helpful.

Regarding the general state of educational preparedness for the workforce, the committee members expressed an interesting mix of concern for students in the middle, pessimism about the educational system's capacity to promote excellence, unhappiness with the average recent graduate's employability skills, optimism about the role career education can play to energize and engage students in academic studies, and willingness to help the cause of educating today's children and tomorrow's workforce.

After reviewing all of the information on knowledge and skill statements for the Architecture and Construction Career Cluster, the committee arrived at a few key recommendations:

- Scheduling is an important part of this career field. Often, workers in this field need to know how to develop long-term and short-term schedules; participate for their role in a scheduled, deadline-oriented environment subject to unpredictable delays; schedule co-workers under their supervision; and adjust to periods of robust activity and declining activity.
- Workers must be aware of and continuously train for jobsite-specific safety programs.
- Within the Design and Pre-Construction Pathway, knowledge of local jurisdictional codes is very important. The knowledge and skill statements should be reviewed to insure that this is reflected.
- Also within Design and Pre-Construction, students should be aware of sustainable design and LEED standards from the U.S. Green Building Council. This falls within the Safety, Health and Environment standards.
- Matters of “construction economics” are important. Workers in all pathways should be familiar with the basics of cost-escalation economics, commodity price fluctuations, and the nature of price- and time-sensitive materials. It is also rather important for workers in this field to have a strong foundation in personal finance, particularly for workers who must plan ahead for seasonal inactivity or who have to provide their own transportation, tools, etc.
- Committee members greatly emphasized basic employability skills: timeliness and attendance, leadership, teamwork, work ethic, basic math and reading, three-dimensional spatial understanding, and problem solving.
- Students should apply math, science and other academic skills within construction-related applications. This should help students see the need for academic studies and better prepare students for the workplace by teaching them to apply appropriate academic skills.
- Oral and written presentation is important. Students should learn to present before a group of their peers, and they will need to make presentations to clients or potential clients in the future. “You are constantly selling your services or what you offer.”

The committee members also mentioned other points of interest unrelated to the specific charge of reviewing the knowledge and skills statements, but related to the general charge of reviewing the success and direction of



career education in Missouri, either generally or particularly as it relates to the Architecture and Construction Career Cluster:

- Ann Merrifield at the University of Missouri-Columbia is a good expert to explore where students go and what they do when they drop out of school, either high school or college.
- The trades, and particularly the construction industry, need to overcome stereotypes and misconceptions of low wages, unsafe conditions, and work that is not intellectually engaging. These stigmas and misconceptions are likely perpetuated by parents, school counselors and others.
- There is a surprising number of workers, both high school graduates and college graduates, who cannot perform at a fifth-grade level in math and reading.
- “We actually train silos.”
- Career fairs, job shadowing, internships, cooperative education, field trips, mentoring and tutoring for students were all highly recommended, as well as externships for teachers.
- One committee member commented that for several workers, the path they pursued educationally and the career ladder that business has in place for them in construction are not in alignment.
- The Engineer In Training (EIT) program and exam for high school graduates was recommended, and it was noted that many people considering a career in engineering (and professionals in the field) are unaware of this recommended tool for preparation for studies to become an engineer.
- All of those represented on the committee felt strongly that students should not only receive training on CAD software, but also training for pencil-and-paper drafting. The committee members suggested that this work helps establish important fundamentals and neatness important to the construction trades.
- Three-dimensional modeling was also mentioned as an important skill and tool to develop three-dimensional spatial understandings, problem-solving and solutions analysis.
- Committee members asked where shop classes would go and what would be replacing them through Technology Education. They suggested that the skills and special awareness of students simply crafting things by hand is very important, both for general development and for the construction trades.
- Students should be encouraged to consider whether their answers to problems seem reasonable. “Does it seem reasonable?”
- For hands-on learning involving math and science, the following construction activities were recommended: stair-stringer, camber on a bridge, modeling, and volumes for columns and cubes.
- A concern about inequities across the state was expressed. One advisory member suggested that without active involvement to counter existing trends, those who are already implementing forward-thinking strategies and programs will continue to improve, and those who do not will fall farther behind.
- “What our primary education system has done is promote mediocrity.”
- “This is so important, because students need basic workplace preparedness.”
- “I’m amazed at the number of kids who can’t do the simple math.”
- Advisory members wondered how many people from industry were involved in the development of the knowledge and skill statements; the survey items (K&S Statements) looked like questions from educators.
- Engineering News Record was recommended as a periodical of interest for the Design and Pre-Construction Pathway.
- Training for first aid, CPR and AEDs was recommended.
- “I think Missouri does have good apprenticeship programs.”



## Art, A/V Technology and Communications

In attendance were: Kent Ford, Missouri Press Association; Carla Steck, Altelier CMS; Joyce Steinman, Learfield Communications; Beverly Strohmeyer, Missouri Arts Council; and Paul Light, DESE.

The challenge in this area is where to start career education/exploration. The industry representatives expressed concern that students need to be in a Career Education earlier than as Junior or Senior in High School.

### *Performing Arts Comments:*

- Need to place more emphasis on business practice and entrepreneurial skills besides just the art or journalism basics. Need to know how to manage the “art process, or writing process” not just learn how to be an artist or writer.
- Need to teach ethical standards and legal issues – ie, First Amendment, Free Press, libel, fair use, slander, and principals of advertising.
- Communications skills are essential in all the arts areas. Provide information back to the public in laymen’s terms.
- Need to teach about public art projects.
- Needs to have business practices training.
- Shadowing should be a part of all these career ed areas.
- Apprenticeships, field trips, visits to arts museums
- There needs to be teacher education courses for instructors of these career courses.
- The counselor is one of the key players in the success of these career areas.
- There was considerable discussion about the training of teachers, the commitment of teachers, the dedication of teachers, and the continuing education of teachers.
- Community partnerships need to be implemented developed.
- There are going to be millions and millions of baby boomers that are going to retire in the next few years. They need to be utilized to mentor, tutor, come into the classroom, co-teach.
- Traditional art and music teachers should not be threatened by the Career Ed Arts courses, but should be a recruiter of students that go into the Career ed courses. There needs to be a drastic improvement of the communication between Art and Music teachers and the Career Education teachers.
- We need to make sure we are not too narrow. It is important to encourage students to pursue their passion. Students need to be exposed in art and music. Art needs to be incorporated into the traditional academic curriculum.
- Students need to be taught that the “arts” are economic development.
- There is too much emphasis on principals of art as apposed to the business side.
- Work ethics is really important for these careers unless it is taught at home. Unless families come from an ag background, kids may not have the work ethic and know how to work hard enough to make a career in these areas that are primarily entrepreneurial fields.
- Exposure is incredibly important.
- Need to overcome issues about letting professionals come into the classroom to teach certain areas or a part of a course.
- Need to develop after school programs from students with interests in the arts.
- Some in the group felt that the course titles were very vague. The professionals in the particular areas don’t know what the course titles mean.
- Public art integrates into everything we have been talking about. Public arts starts with design and construction of any public building.
- There is no credentialing in journalism. The advisor from the newspaper field is reluctant to have a career education field in print journalism. Business ed, marketing ed, and ag can teach the critical thinking skills needed (as well of course as the English and writing courses).



## Business, Marketing, and Finance

Advisors for three related career clusters were combined for discussion, business, marketing, and finance. In attendance were: Steve Clark, The Finish Line; Frank DiTillo, Farmers and Merchants Bank & Trust Company; Dan Francis, St. Louis Pre-Sort; Thomas French, Eli Lilly & Co.; Donna Harden, Midwest Independent Bancshares; Scot Magnuson and Kay Samuelson, Lodge of Four Seasons; Bill Miller, Walgreen's; Kirby Newbury, DiscountCoffee.com; Angela Kinworthy, Education and Business Services; and Julie Lyman, DESE.

### Business, Management and Administration

*Understand roles within teams, work units, departments, and organizations to identify the effect of systems on the activities of a business.*

- I think (the survey results) would be higher than 44% on the “very important” column.

*Use effective communication skills for all modes of business.*

- We often think in terms of technology and tend to e-mail when face-to-face or phone would be better to help build relationships.
- There is a lack of expertise on when to use phone and when to e-mail. There is a tendency to send e-mail, but the problem is not always solved because there is no personal contact. Many people struggle with when to phone and when to use e-mail.
- Communication breakdown not always due to mechanical breakdown. If we are not communicating properly, things can be misconstrued. E-mail does not have inflections. A teacher can draw interest, a book cannot.
- Typing is very important in his business. Employees must use those skills for their job. E-mail etiquette is needed. Negative messages or a sense of humor sometimes gets lost in an e-mail and can be misinterpreted. The larger the corporation, the more sophisticated the technology and with no standards on Internet, the playing field is not even. Often when you call a company you get prompts and often get the wrong department. When relying on technology, it can be efficient, but the personal touch is missing.

*What other skills and knowledge are essential as a foundation for success in an array of careers and educational pursuits in Business, Management and Administration?*

- College students are not managing relationships correctly with customers.
- Seventy-five percent of the complaints in business would have never happened if salesperson would say “I am sorry.” Face-to-face interaction is essential to success in business. We must get back to one-on-one interaction. Younger people don't know how to react with personal communication.
- Customer Service Representatives can get impatient with customer, yet will demand service elsewhere. Young people send e-mails all in small letters with no thought to communication etiquette, but a father will send an e-mail like a formal letter.
- Some people can do public interaction and can speak in front of people, but can't do one-to-one communication. There are people who don't understand a business plan or can't read a financial statement. Employees need to have concern and interest in the company bottom line.

*What additional skills and knowledge are essential for careers in this pathway? (Management)*

- Skills needed are math; Word and other business related software; the ability to translate information into usable data; and learn to read body language.
- The technology world is fast paced. Warfare can become like a video game. Children can be drawn into that, but they must know how to use technology etiquette and communications skills like goal setting. Many of our students may be setting goals, but they have a low goal like getting a high school diploma. They need to have higher, long term goals.



*Identify, develop and plan training materials to use in training and developing employees in a company.*

- In a classroom, there is misconception about being competitive. They need to tone down the self interest because self interest can blind students and they avoid being more involved with others in projects. The more they can work successfully with teams, the more they can learn and succeed.
- The University of Phoenix has a degree you can earn without ever talking to a person. The education system is going to large classes with no “people” interaction.
- Some students drop out because there is no interaction—no one to counsel them. Some kids are not happy when they do group work and someone does all the work while others do nothing—but that is real life.
- Counselors are not helping sometimes. They could use more involvement with people who leave school, succeed and then are never asked back to help mentor students. Put back that direction in school.

*Analyze company assessment of personnel needs to select qualified employees for current openings.*

- Human skills used to come from parents, but some parents may not have those skills themselves, or are not doing teaching those skills, so it is left to teachers and counselors.
- People don’t get involved.
- Japanese students have teachers and schools that are more like parents. Schools may be more involved in student’s lives than parents.
- Everything I learned I learned in DECA. Practical education is essential.
- There is so much pressure to provide socialization skills and teach morals. Other places in world are so anxious to learn, but here in the United States we don’t use the educational opportunities that are there.
- Students have so many interactions with television and computers, they grow up faster. They don’t know how to serve others. They need interpersonal development to build character.
- DECA students are great students compared to those not in programs.
- DECA is now often cut back and is often missing juniors and seniors who could help positively influence the younger students.
- You may have hit on problem. Experienced teachers are retiring and those coming in sometimes lack knowledge and interest in programs like DECA. In the information age the school districts are growing and can’t keep up.
- As you travel around the schools you can see teachers who may be intimidated by students and students run classrooms.
- That is a good point. Mentoring would be good. There may be some who have had teacher training, just not teaching degree.

*Develop separation, termination and transition procedures for processing employee personnel actions.*

- The trend is towards outsourcing human resources areas.
- New employees come into corporate setting and want to pick and choose which policies they want to follow and which to ignore. Managers must enforce, but many struggle with enforcement because easier to let it slide. Small details need to be called out. Not a good message to let them decide which values to follow. Parents and business must deal with it.

*Form a clear statement of the problem to ensure consistent understanding among all stakeholders.*

- Research is important; the biggest problem is knowing what to research. How do you know what it is you have to research? Who is the person who has to research?
- There are only 2 responses, so the sample size might be criticized.

*Evaluate customers and their needs to determine pricing of product or service.*

- This doesn’t specify positioning.

*Prepare documents for presentation.*



- The key word is information. People can't get their hands on what information you have to have and how to make it easy to understand. For example, people don't have their financial statement or if they have them they don't understand them.

## Finance

*Develop and deliver formal and informal presentations using appropriate media to engage and inform audiences.*

- I question the spread of 33%, 33%, and 33%. It should be more important.

*Develop and access a database to manage general information.*

- Some organizations are big enough to have people who do that, but many have to do their own. In high school, this would be very important
- This is a huge organizational skill.
- Did people think that IT would take care of that? I think the respondents thought someone in IT was going to write the program. The way the question was written may have skewed answer.
- Companies may not want someone to find information and someone to read data.

*Examine current events to determine their impact on the financial industry.*

- Encourage people to know what is going on in the world. External events affect business.
- Anything can suddenly change the financial world and affect stock market. One media event can change everything.
- Whether the media reports it correctly or incorrectly.
- Employees need to be able to analyze information for accuracy.
- Use media, but don't trust it.
- Examine and research. Tabloid information needs research. Media can spin facts.

*Implement safe and secure environmental controls to enhance productivity.*

- Working at the bank, we spend so much time following regulations. When there is expected fraudulent activity, an SAR must be written. Over two million have been turned in, none prosecuted. Banks must serve as police-customer pays for it.

*Analyze practices of the finance industry to determine ethics and social responsibilities.*

- Ethics is a very big issue. It is very important to teach. I am attending a class at Northwestern and ethics in business is really emphasized in my course for bank professionals.
- The need is for more than ethics. Accuracy and paying attention to detail can have a huge financial impact.
- Junior Achievement has a one day workshop on ethics.
- It is hard to teach business ethics when there are no social ethics. You should create a different question on ethics alone.
- This should be ranked higher.
- A good example is Enron. Many unethical decisions are made because survival depends on making the stockholder happy. This is very important.
- Ethics is important on the whole. Teaching ethics should be one of top priority. It may be simple things like employee time ethics. For example, the employee taking personal calls at work.
- Bad ethics begets more bad ethics.
- Customers expect business to have ethics.
- Business' have to deal with customer ethics.
- Wal-Mart will take back anything.
- Target will trust customer on price checks.



- The retailer climate is changing. They are developing systems to manage returns. There are authorization centers to check for a history of returns. If the system shows too many returns, the customer can't return items.
- Customer is always right, but every customer is an asset or a liability and business must be able to identify. It is a new way of looking at customer—will there be a profit.

*Pursue career development skills to advance in the financial world.*

- I would think that would be higher rated.
- Some companies don't encourage advanced skills because employees may be job hopping with the idea that the more I learn the sooner I leave.
- Benefits will keep personnel. They are more satisfied to stay. There is not as much job hopping in community banking, there are more large bank employees want to go to a community bank.
- Leaders will develop their staff because they grow as the staff grows. There are all types of skills and that could be a class in itself. Level one is put you in a position of leadership, but to go up levels, you must develop leadership skills
- The definition of leader is vague. You want to follow ethics, but then you could be fired if you tell on someone. There are lots of ways to be a leader.

*Examine characteristics to distinguish between insurance and annuity products*

- Did person really read the question?

*What other skills and knowledge are essential for this career pathway? (page 7)*

- There is nothing about personal money management. When companies look for people to be a financial planner, they may consider if your personal financial life is in good shape.
- Is ethics mentioned?

*Compile business transaction data to report financial information.*

- Where does a person learn to do their own budget? That needs to be tied in here.
- The average American credit card debt is \$13,000.00.

*Use technical and people skills to perform lending functions. (page 11)*

- There may be more information than needed concerning regulatory compliance.
- What about students who don't know how to move up the ladder in business?
- I would not want to see someone quoting regulations.

## **Marketing, Sales and Service**

*Integrate social-studies skills into marketing, sales and service to better understand customers and the economic environment in which they function.*

- What is meant by this?
- Economics is also a marketing segmentation. Geography has effect on why certain markets do better in certain places.
- In sales and marketing, geography is important. For example, in the South, boiled peanuts are on all shelves, but in Nebraska, there are no sales. They should study social environment. It could generate sales.
- This goes back to communications.
- I agree it may be wording.
- Marketing, sales and service are different, but connected.
- Good point. Marketing applicants think they will be in a cubicle in the corporate setting doing advertising – they don't see the connection to sales.
- Marketing, sales and service reflect on each other – it is a circle.



*Apply problem-solving and critical-thinking skills to help grow the business and/or to resolve workplace conflict.*

- Students may not connect the math skills needed here, but it is essential. Research also belongs here.

*Implement safety, health and environmental controls to enhance productivity in marketing, sales and service.*

- The food industry may thrive on using a colorful picture but it may not be healthy. It is a good marketing strategy. Are they trying to look more at health? Are ethics involved? Go for the buck or for health. McDonald's is now showing milk and apples in their commercials.

*Exhibit ethical behavior in marketing, sales and service to create goodwill and trust.*

- Get students to read media to decipher what is real.
- When you are talking about health or safety in marketing for gain, it is not necessarily ethical.
- Like McDonald's showing milk, but not other aspects of the rest of the food.
- Current events are not mentioned.
- The environmental issues are not shown as important. More groups want to have a "green" conference. It is coming more on the radar. When you compare savings and cost to environmental benefits, usually savings is the deciding factor.
- Is it ethical that Wal-Mart is building more green stores, but is employing less people in those stores?

*What other foundation skills and knowledge are essential for all careers in Sales, marketing and Service?*

- Colleges are cutting out international classes because they need entrepreneurship. They should do both.
- No mentoring is mentioned or DECA.
- The mentor should help to show student what happens with bad decisions and bad marketing.
- Managed marketing activities need to relate to sales and service. Public relations aspect needs to be considered. Lots of things to do that don't cost money.
- Spell out what marketing activities are involved. This country's strength is entrepreneurship.
- Inspire students to think outside the box.
- There are lots of great ideas, but how will they be implemented. Put ideas into a profit situation.
- Need to teach the concept of courage so they can continue when people put them down.
- The concept of courage is very important. Japan is also teaching creativity.

*Use staffing, organizing, leading, controlling, and planning to manage sales activities.*

- Make sure ethics is in there.
- Don't forget networking. Have resources available to use.
- I am surprised by the percentages reported on staffing—success depends on surrounding yourself with good staff.
- That is urgent.

*Employ communication and interpersonal skills to facilitate interactions with others.*

- Very important.
- Agree. Communicating with others is very important. What you are saying and what we are hearing is important.
- Body language is a must if in sales and service.
- It is difficult between vendor and buyer or distributor if communication and personal skills are not addressed.

### **Credentials/Certifications**

- There are computer-related credentials for certain software packages.
- Microsoft has certificates. But, students may have a certificate, but no business sense.
- Tips program has credentials.
- There are Certified Financial Planner and CPA certifications.



- Certified Economic Developer, and NDC
- Certified meeting professional, certified meeting manager, government meeting planning, certified meeting executive
- Could we create a certification specifically for high school students?
- Jefferson City High School Academies—take classes and start learning what profession they could be in—job shadow. Has son that has worked in emergency room.
- Would it be better to have a portfolio with experiences?
- When I hire, I don't consider certificates first.
- Get students engaged!
- Everybody likes to have recognition. It is good to be proud of what you do and what you stand for. When looking for someone to hire, you look at what have they done, what are they proud of. In business, we have rewards. For students, a reward program is very important. It could inspire others.
- Mentoring. It would be good to have potential mentor team with someone with mentoring experience. It would be good to have actual work in field path.
- Community service is important. They could do research for a community organization for practice. That makes it a real project. Could there be certificates for that?
- Schools need to work with businesses. Some of responsibility is with business to get into classroom and be mentors and partners.
- I could use high school students to work with me at the college.

***What advice or insights would you give to a student considering entering your industry?***

- If someone came to me, I would say find someone who is in business and mentor with them to see if you like it.
- Study your career and include international business. DECA is wonderful. Get them involved in Sister Cities where young people can get involved in a community. They might work with the Rotary Club or the local chamber of commerce. Get practical experience. Learn tolerance, acceptance, diplomacy, and negotiation. Find a way to be positive.
- In the food and beverage industry, we like to get people who are trying to get to other goals, but are also learning other things while there. Mentoring is highly recommended. Hands on activities are important. Is the job something you can live with? Find someone who is a success and get hands on experience and advice.
- Get out of the classroom. Intern, job shadow, or get a mentor.
- Ditto. E-commerce bubble may be burst, but dot-com business is still there. High Schools don't understand the virtual world. Students are quick with Ipods and gaming, but that is not commerce. The challenge is with the huge gap between big business e-commerce and gaming. Business students need more personal skills, organizational skills.
- Skill sets can't teach attitude. For anyone who wants to go into industry, the most important thing to bring to job is attitude. Everything in business is important—all details are important—prioritize—everything has to get done. Organization gets things done. Things happen, but in jobs there are severe consequences when things were not approached with common sense.
- If someone wants to be in service industry, they need to be serving now. Key club activities are an example. Students need to do service in high school. Service can provide a mentor. See how you like helping others. Ownership can't be taught, has to be desired.
- Guest speakers are great. I am amazed at the medical academy guest speakers. They tell students what their job is and what education is needed. Students can take their own time. Stress issues are something that needs to be taught as well as how to deal with it. Public speaking is important in any field. Mentor your own child or others.



### **How can we better partner between education and industry to prepare students?**

- DECA. The best students in my mail company came because I went to school and asked them for student recommendations. I was the #1 employer in DECA at one time. I have 20 employees who have been there since they were 16 or 17. If there is a problem with a DECA student, the teacher was partner to guide students.
- DECA is an awesome tool. It inspires kids to learn, compete, and be successful and to carry on to the next level. It gives some hands on experience.
- Internship. Could we give school credit? Industry leaders need to come into the classroom. Not everyone will be able to get an internship, but we could get leaders into class to teach an hour. Education has poor funding there need to be an initiative to tap into industry funds. Have a few more clubs in different content areas developed like DECA.
- Everyone is in sales. Sometimes the aspect isn't brought in that you are continually selling yourself. Be a part of all they are learning. Challenge them to get any opportunity they can to take on a project and take on all the aspects, don't be compartmentalized. I am concerned about kids that are not in DECA. When they think they are going to college and are taking AP classes and full class loads, they are not getting practical experience. Mentoring or bringing in professionals to classrooms is a way to siphon out what you want to do and what you don't want to do.
- This group supports DECA. An advantage to DECA is get students into the workplace. We don't do a good job of getting different experts back into the classroom to help and teach. When experts come, the kids are all questions. Students need to be active in the community performing a service.
- When you debrief, tell them that preparing for DECA is very difficult. In the business world, don't run into that often. It is a tremendous experience. Profit is not a bad word. Ask schools to have guest speakers. Students need to have ethics training, accept mistakes, apologize, and develop good personal relations.



## Education and Training

In attendance were Mindy McCollum, Metropolitan Community College; Hap Hairston, Central Methodist University; Al Dimmitt, Metropolitan Community College; Andrew Filla, Metropolitan Community College; and David Ruhman, Arcadia Valley Career Center, Bragg Stanley, Christine Hollingsworth, Don Eisinger, and Steve Coffman, DESE.

As follow up to the general session by Ann Benson, Mr. Stanley asked the group to relay any concerns related to Career Clusters or the process being taken by DESE. Some of the comments included:

- While it is important to make learning relevant to business/industry, it is also important to make learning relevant to the learner. Assessing aptitudes is very important.
- Use of Kuder/Missouri Connections is good, be sure it is connected with the program of study.
- Online and other assessments of career interests or aptitudes is important, but we cannot underestimate the importance of having adults talk with students to help them sort out issues related to careers and planning.
- We are not addressing hands-on experiences until the 11<sup>th</sup> or 12<sup>th</sup> grades, and this needs to be much earlier. Not enough program graduates are coming back to the schools to talk on a more peer-to-peer level about their careers (or current students in the career programs). Middle school exploration is essential – but we don't have the resources to do the kind of exploration that is most beneficial (field trips, hands-on, etc.)
- Partnerships are crucial to provide these opportunities for exploration.
- Students are choosing career programs based on personal experiences they have had (for example, they have spent time in the hospital, they want to become a health care worker). How can we provide opportunities for them to see more options or be sure to validate what choices they are currently considering. The classroom teacher at exploratory level is key (below middle school).
- There is a disconnect between student perception of what they want to be and what that job actually requires. Stereotypes of jobs occur at all levels (including postsecondary).
- The A+ tutoring program must include confidentiality, appropriate behavior and actions – right now these student tutors are not properly trained to be a role model in classes (ethics). The hours students are working in the A+ program should be more focused on the teaching profession/tutoring, not making copies at the machine. There needs to be better standards and preparation.
- At the postsecondary level, does anyone ever look at what the program of study done at the high school level? Aptitude tests taken at 8<sup>th</sup> grade?
- Interest inventories – what are the best tools to use? Does the tool provide really useful information? Is it a good tool to use across the board rural vs. urban? The tools need to be updated and maybe multiple tools need to be used.
- Hopefully these tools will help students see the cluster not the specific occupation, and that the counselor will help students interpret the results.
- Education is seen as a “default” position – something to fall back on. This process may help people see teaching as their first career choice, not a fall-back. We need to help raise the status of teaching.
- Remedial courses – one reason might be the expectation on the high school level is very different than the post secondary expectation of the mastery of skills before entering the course.
- Teachers must see that the content they are teaching does have real-world application and relevance to career and adult life. This applies to ALL subject and content areas.
- MO work readiness certificates – includes academic knowledge, personal skills, ethical/professional behavior, etc. This is a work in progress. Schools can volunteer to implement this. If employers ask for this, schools will begin to provide.
- How do we get all teacher education institutions involved?
- Innate traits – how to address?
- Associate Arts in Teaching adopted/approved at community colleges – how does secondary school program articulate into this and 4 year degree in education?
- We need to involve those who helped develop the AAT so that the program of study is aligned. Send contacts to Bragg so they can be invited to the educators' advisory council. Also contact Mike Lucas in DESE.



- Business/Industry must realize that it will take money and time to develop highly qualified teachers and administrators.

### **Knowledge and Skills Statements**

- Page 3 information technology applications – members felt that is “very important” vs. “important” as listed on the page. May need to be sure technology is seen as very important in the DESE program of study document.
- Foundational skills should include more emphasis on the mastery of the content – teachers must be qualified to teach that particular content area – also see page 7 for reference to subject matter. Acquisition of the content knowledge – this is the job of the college to be sure students know what they will be teaching.
- Content must be learned at the college level, but at the secondary level students must get a broad picture of the many areas of being an educator (more than the love of the content). Students need to know some of the other expectations of the profession besides teaching a particular subject.
- Page 2 – items 2 and 3 are similar
- It is important for students to see multiple and diverse teaching situations (urban, rural, suburban) so they can see what different schools are like – otherwise they just tend to want to teach in a school like the one they are now attending.
- Student behavior and classroom management is not evident in the teaching/training pathway – perhaps should be more prominent in the knowledge and skills statements.
- Interaction with administration and interaction with parents (communication skills) should be included in the list.
- Conflict resolution skills are not prominently identified and should be.
- These knowledge/skills should align with the MOSTEP standards?
- It is important for a teacher to know how to use multiple assessments.
- Multiple theories and strategies are also important.
- Page 10 Professional Support Services - is there an assumption that they already have the content knowledge of their area of expertise?
- How do these positions fit into the big picture of the school setting – are there knowledge/skills that can be identified for this purpose? Acting as an effective member of the team is an essential skill.
- The items are generic so they are all “important” or “very important.”
- Administrative and Administrative Support - ISLLC – leadership standards (Leadership Academy) – these skills should be cross walked here

### **Program of Study**

- The committee focused on teaching/training program of study sample, and had these comments:
- Experiential activities to introduce students to multiple hand-on experiences must be included and may include cadet teaching.
  - Cadet teaching students should pass a minimum set of standards before being allowed to teach in a class
  - Students must be exposed to all levels (elementary, middle school, high school)
  - This should be more than a one year program – year 1 and year 2 – an advancement of skill through experience
  - All CTE courses need to be rigorous and high level to prepare students for these higher level skills – concern that child development courses are too watered down at the secondary level because of the high number of lower-level students in the classes.
  - High school sociology or psychology course should be required
  - We must have a framework for cadet teaching that schools should follow.
  - Provide a certification for cadet teaching showing that cadet teachers have mastered a set of essential skills before working with classes
  - A+ hours vs. hours volunteering for credit – check with DESE staff to see if a student’s cadet teaching hours will qualify for A+ hours.
  - It would be best to have the A+ hours done in the 9<sup>th</sup> and 10<sup>th</sup> grades, and then build upon those experiences by enrolling in the teaching program for the 11<sup>th</sup> and 12<sup>th</sup> grades.
  - There is no nationally recognized certificate program for this area?



- English ok on program of study
- Math may need to be changed to meet the time that the MAP is given in Missouri
- Science – ok
- History – fit to MO requirements but generally ok
- see if 13/14 aligns with the AAT
- Articulation/dual credit – statewide articulation agreement for education (similar to other statewide agreements that we have been doing)
- Avoid duplication
- Wording on the actual form should remove “less than” and instead say occupations requiring a certificate or associate degree
- should say “teacher aide” not “elementary aide”
- Is Youth Development in human services?

#### *Administration and Administrative Support*

- Include a new heading that stresses experiences that are beneficial/essential before administrative positions

#### *Additional Comments:*

- Industry - don't ask for tax abatements – the schools need the money to provide the best workers
- Because of funding, those that are doing the teaching are making much less than those they are preparing (student leaves the community college and makes 1-2 times more than the instructor). This makes it very difficult to hire the best to teach.
- Provide scholarships for students that are going into education (not necessarily into a particular industry area)
- More dialog between schools and public 4-year institutions about what high schools need to be doing. Some sort of forum?
- Higher education partnerships need to include arts, sciences and business, not just deans of education. Include content areas, beyond administration. Those actually doing the teaching must be involved or there is a disconnect.
- What is the next step to get the 2 and 4 year institutions on board? The administrators have bought into the concept, the faculty has not. All in this together to help prepare teachers and educational staff.
- METS money – can that be a way to get the 4 year arts/sciences involved?
- Be sure educator committees involved elementary, high school, middle school, 2 and 4 year institutions.
- AAT can be used to provide that transition from the high school to the community college, but will the 4 year accept and be receptive to the AAT?
- Must show the rigor and data from the CTE programs to show the 4 year institutions the value of these programs.



## Government and Public Administration

In attendance were Lin Appling, Public Service Commission; Dan Ross, Office of Administration; Terri Fayle, Missouri Center for Career Education, University of Central Missouri; and Doug Sutton, DESE.

### ***Foundation Knowledge and Skills***

- Students will be able to be more successful in public sector careers if able to draw upon skills aligned with abstract reasoning, logic, problem solving, and higher order thinking skills. Each of these contributes to the proper planning, delivery and evaluation of programs and services.
- Those persons able to more effectively work, and advance in the public sector need to develop communication skills, for both oral and written communication.
- The need exists for development of skills to enable people to work within teams, adapt to change, and be able to effectively conduct research. Effective research includes having the ability to determine what is or is not pertinent data and evidence.

### ***Pathway Knowledge and Skills***

At the secondary level, any program activity focused on better preparing students for further study in governance and administration should include:

- Stewardship;
- Responsible citizenship (more than just civics);
- A greater emphasis on math and science (for many public sector positions); and
- Technical writing.

At the post-secondary level, study should include skill development in areas which include:

- Policy/legislation/regulatory development;
- Organizational theory;
- Management of change;
- A multi-faceted understanding of technology (some areas need a more technical, “hands on” ability to make things work, others need the skill to grasp how technology can become a tool to assist achieve goals);
- Development of skills which will enable people to be able to work independently, and in groups.

### ***Credentials/Certifications***

The committee reviewed the list of credentials listed in the national model and felt an expansion of that roster was an appropriate step.

Committee members will investigate within their departments and provide known credentials to DESE. It is anticipated this list will include, but certainly not be limited to credentialing for:

- Economists;
- Project management certifications;
- Registered professional engineers;
- Engineers in training;
- Certified financial analysts;
- Certified financial planners.

### ***Preparing for a career in this industry***

The committee focused attention of other ways students can be better prepared for continuing education focused on, and careers within, the cluster of Government and Public Administration. Though some responses are global regardless of career interest, the committee encouraged greater emphasis on the following:

- As a content area, civics should be taught earlier than commonly in practice in many school districts. Starting this instruction at the middle school or elementary level is suggested.
- More attention should be given to providing students with the skills to determine what their talents and interests are, and what options are available to them to utilize those gifts. This includes a better assessment of the type of learner the student is, or in what setting the individual learns best.



- The development of life skills to encourage youth to “see beyond tomorrow” is essential.
- Students must be given stronger communication skills, both oral and written.
- Students should be required to develop public speaking skills and defend stance(s) through structured argumentation.
- Organizational skills are a necessity. Students should learn how to outline for writing, organize thoughts, and organize work.
- All students should be given opportunities to lead and to follow. These experiences will better enable students to manage and to be team members.
- The new requirements for personal finance coursework would segue nicely as a prerequisite for economics study.
- Preparation for public sector careers should include instruction in the legislative and budgeting processes, politics (both capital and lower case “p”) as it pertains to competing interests and implications of such conflict, or the lack thereof.
- A greater focus should be given to learning how to identify who are one’s customers, and determining what they want from government. If the public sector is to measure success, students must understand the importance of determining effectiveness/progress/results. Does the program of study (in place or planned) provide students with the knowledge and skills needed to establish benchmarks and milestones.
- Students need to develop skills enabling them to multi-task.
- Students must learn how to deal with strong personalities, and how to manage conflict.



## Health Science

In attendance were Jeff McGraw, Bothwell Regional Health Center; Judith Donovan, Missouri Organization for Clinical Laboratory Science; Diana Inman, Boyce and Bynum Pathology; Danette Beeson, Missouri Department of Health and Senior Services; Ken Koch, Missouri EMS Association; Vera Carter, Berland Diagnostic Imaging; Lori Bonnot, Missouri League of Nursing; Carla Mahaffey-Sapp, Missouri Association of Nursing Home Administrators, Donald Scott, Missouri Center for Career Education, University of Central Missouri; and Matt Haeffner, DESE.

### **Foundation Knowledge and Skills**

- We need to emphasize information technology applications more...they are more important in every field now as we are further documenting things online. Our staff needs more computer application training.
- Need for a degree or certification that supports foundations for basic computer knowledge and skills.
- I like all of the categories presented in diagnostic services...they are not *luke warm* and there is no lack of a basis for the content contained.
- I am pleased to see 72% of the respondents thought communication is very important and understand the need and importance of good communication skills.

### **Pathway Knowledge and Skills**

- In diagnostics field, we are interested in improving the quality of the workforce. We are experiencing a critical shortage in radiology students because they are shying away from the field due to emphasis placed on regulations and regulatory bodies. We need to create additional interest in the field of radiology with an emphasis on quality control.
- One thing that does not come through very well in the statements is leadership or morality and productivity. Where is the emphasis on the importance of leadership and people skills? This is a difficult field...people are leaving all the time...long hours and low pay.
- Other gaps need to address.
- Health informatics good responses but do need leadership addressed.
- Agree skills and knowledge statements are good from therapeutic perspective and adds field is young and filled with people looking to find a *niche*. EMS...where else can you drive fast? In the beginning, people in the field were looking for short term careers...now evolving to a longer career focus. Leadership is lacking in today's workforce...who will be able to fill my job when I leave...are they going to be prepared? I don't know whether they have the problem-solving or social service skills to handle the types of situational adaptation needed to work in this environment. Generally, those working in this field need to be experienced at being able to support for the young staff. Two 21-year olds may be working together with only one supervisor who may be able to monitor and provide input once daily. They basically function on their own and need the basic work ethics to do that.
- Lab medicine is in transition [changing]. The field is deteriorating because much of what we used to do is now being done by doctor and independent labs. Nurses and LPNs are now doing testing [blood draws]. It is a dwindling field characterized by a workforce that are more introverted...not a lot of people are attracted to the field...ten is a big number for a class and the skills that used to be required are now being done by machines. This area is also not licensed and overlaps with biomedical engineering. My program is going through an accreditation process now which may lead to a required registry exam. Overall, people in this field haven't changed as a group very well.
- I am concerned about the shortage of a qualified workforce. The subject appears to be of little interest...students are moving away from my field. It is extremely important for relaxation of the amount of control over the radiology field if we are to attract new young people. We need students who possess people skills and who understand the physical requirements of the job. They also must be interested in helping people.
- I agree with social skills...our workforce needs the ability to interact with patients and students in school do not understand this pathway is even there. This field is characterized by a revolving door where employees come and go. The training is expensive and exposure to the field prior to going through all of the expense would be beneficial.



- The new personnel we are seeing definitely lack communication skills and professionalism. They don't exhibit appropriate behavior. They also need critical thinking...the ability to think on their feet.
- Nurses are not getting the respect they should! Many are there by default and not realistically prepared for the challenges they face or the pay they will receive. They need the ability to respect their patients and co-workers and instill pride into what they do. For many, they are there for a paycheck and express that attitude.
- Professionalism—educators need to set standards for students. Reality of the workplace is usually very different from what the experience in the classroom and the curriculum. We need to set standards and hold our students to them in and out of class. I agree they also lack problem solving abilities and appropriate ethics for the field.
- [Refers to comment above] This may be due to a shortage of educators as well...many educators are full time workers who teach as adjunct instructors. I think education is slipping too.
- I think introducing students to careers at the junior high level is not a bad starting place to address careers and specific professions requirements.
- I agree, counselors can be a joke...provide no help with career pictures and options. By 9-12, students need a good *flavor* of what is out there...real life perspective with hands on possibilities to peak their interests or identify a potential career they may or may not like.
- My husband is a 9<sup>th</sup> grade counselor and he does give presentations and provides exposure to careers to kids...they [kids] are just not realistic.
- Is there something out there that can provide kids a method of knowing what they are interested in? (Matt H. explains Kuder and Plans of Study.)
- Career education should be stressing skills...what they know and what they can do [urinalysis, draw blood]. We need to emphasize reality and real skills.

*Discussion of early implementation and what needed to accomplish goals:*

- We need to provide guidance instead of letting kids flounder. Guidance that provides a stable guideline to get students there [seamless]. We also need to provide motivation rather than relying on hit or miss or land as you may.
- New people in my field need to know as much as an LPN...you must know disease processes and be able to transfer the correct procedures to paper [coding]. You also need to be able to address patient issues and doctor relationships. LPNs tired of nursing make the best coders because they know the hard sciences and what is going on to code properly.
- I think this [Clusters] does reinforce the need for advanced math and science and provides a means to justify the courses to students in real world terms. This provides a reality of a career...the expectations and exposure to the lifestyle people in this field lead.
- This is a problem...what is being taught does not reflect with the reality of on the job demands...negatives or positives. Consequently we have people repeatedly changing their majors in post secondary education. We need to expose students to careers long before college so they don't waste time and effort at something they don't like.
- We need more career training, job shadowing, and job training that actually involves working in the field.
- We are not getting a lot of cooperation at school sites. We need to figure out how to get more students and people involved in new and engaging tasks to keep things up [clubs]. We need more training and methods to implement activities across the state.
- Agrees...we need more training and professional development opportunities to teach something and convey why they choose this as a career.

*Comments:*

- Display passion
- Provide encouragement
- Emphasize options
- Convey potential for success
- Teachers stress options (get good grades to leave door open)
- Emphasize testing requirements
- Stressing responsibility & self-esteem



### *Plans of Study*

- POS great for his field [add computer knowledge] [get to kids sooner] waiting until seniors are too late.
- You have to get to them earlier don't see wide variety in pathway where they can go. No idea of what is out there.
- We need to be realistic about what can be done but need to think outside of what they have been exposed to. Reveal a stepping stone path to completion.
- For therapeutic services...the online line is blank...something needs to be there between 12<sup>th</sup> grade and post-secondary (before certification) otherwise all of this is good.
- Like the pathway but High School [POS] needs more emphasis on computers early as well as expanded communication skill development.
- I like what I see [POS] these courses have good emphasis on language and volunteer work that provides a means of seeing if the passion for the career is there.
- This [POS] outlines the purpose for taking courses and reminds the student of the big picture...goals at the end.
- POS looks good...maybe more emphasis on critical thinking to prepare students for the *unknown factors*.
- The POS is excellent in helping to understand career options and what it takes to get there...agrees need more information systems, computer literacy and background information about the field.

### **Credentials/Certifications**

- MODHSS—(e.g., CNA, CMT) need Restorative Assistant certification
- Board of Nursing (e.g., LPN, RN)
- ASCP credentialing but no certifications (at least mandatory).
- American Registry of Rad Tech...falls under Nuclear Med certification...might need an ultrasound certification [new, emerging].
- ASCP—AMT Phlebotomy needed.
- MODHSS licensures for EMTs but need for National Registry.
- Coding certificates recognized by rural agencies and hospitals.
- CHPS—certified in health privacy and security.
- Molecular Pathology—medical techs do the test...may need special qualifications

### ***What advice or insights would you give to a student considering a career in your industry?***

- Keep options open...get a good foundation of the basic sciences and computer sciences. These skills are essential to manage the volume of new medical knowledge created every year and code things properly.
- Make sure students understand enough about their interests to suggest career and opportunities to them while keeping their options open. Know the job well enough to determine whether it is something you can do physically and be interested in for the long term.
- If a student likes science...help them take as many courses as they can prior to entering post secondary education. Enter into A+ programs to help offset costs. Get an MLT so you can work and earn while you are going to school to help you find out if you like the field. Don't go to school as an end...live and love life while you are going to school.
- Develop a concern and care for others. Keep sciences and other subjects in mind and take them as needed...and keep all options open in the process.
- Engage in self-reflection of your own personal qualities to determine if you are really suited for the field.
- Take education seriously...take the core classes in high-school so you know more about what you want to do. Realize that nursing schools and career are very competitive.
- There is a huge shortage of persons in all areas that continues to increase as years go by. Hang tough despite the lack of respect for what you do. Recognize the intrinsic rewards because they make up for the short comings you will experience. Explore alternatives in the field to find where you fit.

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- Have students write a two-page handwritten paper that reveals why do you want to become a CAN [or other]. Have them present or read some to class. This gives students an idea of a potential fit for the health field and provides an opportunity for encouragement.



## Hospitality and Tourism

In attendance were Claudine Binz, Millenium Hotel; Michael J. Gadell, RLB Franchise Company; Jerry Vincent, Missouri Restaurant Association; Dee Ann McKinney, DED; and Debbie Pohl, DESE.

### **Foundation Knowledge and Skills**

- The online survey was very easy to take.
- It appears that many taking the survey were from management level.
- On page 2 of the survey document, related to the knowledge and skill statement related to geographic studies, if you work in destination management (tourism), that is important, but maybe not as important to the other pathways.
- On page 2 of the survey relating to understanding cultures, it is important to understand the ethnic background in working with employees in this cluster.
- Much of this is learned on the job. In the restaurant business, all of the chains have training resources to develop skills for employees at the entry level. Single unit owner/operators don't often understand where to get resources to assist with this training. The Missouri Restaurant Association is there to provide these resources. The skills needed are communication and basic reading, writing, and math.
- The same holds true for the lodging industry. Another common thread is customer service.
- It is hard to look at an entire workforce in an industry through this one set of competencies.
- Communication and problem-solving skills and manners are critical.

#### *Which do we not need in Missouri?*

- All are needed but the wording on several is very misleading and unclear as to the actual meaning of the statement. Words such as “analyze” and “synthesize” are words more often used by educators instead of language that the industry would use.

#### *Which knowledge and skills are missing?*

- There needs to be more related to customer/guest services, particularly related to work ethic, attitude (“not my job” mentality), manners, conflict resolution, dealing with adverse situations; those things that students are not getting from their family unit. (All representatives were in agreement that this is a huge problem, particularly with entry level employees across the cluster.)

#### *Which grade level should each be taught?*

- All these skills are essential and could be addressed at the secondary level, particularly the socialization/work ethic/attitude skills mentioned above. Should be a required course.

### **Pathway Knowledge and Skills**

#### *All Pathways*

- Comments 3 through 6 on page 24 of the survey results say it all with regard to what is needed of employees that come to all the pathways careers in this cluster. (These comments relate to work ethic, conflict resolution, interpersonal communication and other customer service skills discussed by the committee under the foundation area.)

#### *Restaurant, Food and Beverage*

- Knowledge and skill statement related to researching and evaluating technical resources for food service and bar operations...What does this mean?

#### *Lodging*

- On page 13, the second skill and knowledge statement listed related to reviewing independently owned and chain-affiliated lodging facilities... is important but too broad and really contains two concepts. This should be broken into two statements.



- People in the industry say that students don't have up-to-date technology skills. (An example was given of using symbols and abbreviations in e-mails instead of using correct writing skills, grammar, etc., as part of these and other written communications.)
- These are probably “textbook” stated knowledge and skill statements vs. what happens in real life.

#### *Tourism*

- On page 15, the knowledge and skill statement related to safety and security is the number one priority, but it appears on the survey that the wording may have been confusing and therefore made the results look less important.

#### *Which do we not need in Missouri?*

##### Restaurant, Food and Beverage:

- All these knowledge and skills are needed, they are a good start, but do not include specifics that we address in the industry.

##### Lodging:

- These appear to be written from a certain perspective, operations. Other areas of employment in lodging are not as clearly addressed such as engineering and security. Could be a result of who developed these at the national level.

##### Tourism and Recreation, Amusements and Attractions:

- All are needed.

#### *Which knowledge and skills are missing?*

##### Restaurant, Food and Beverage:

- Business math; bookkeeping and accounting
- What is listed is a good start, but it appears that the people who wrote these are not in the business.

##### Lodging:

- Knowledge and skills for other aspects of lodging industry skills are needed. Again, these appear to be solely related to lodging operations.

##### Tourism and Recreation, Amusements and Attractions:

- Does not address psychology of tourism, marketing for destination. It may be necessary to add courses for these topics.
- There is nothing on how to measure/prove the effectiveness of tourism in an area, particularly at the convention and visitor's bureau level. Attractions can count ticket sales, but not as clear cut for looking at this at a community level.

#### *Which grade level should each be taught?*

##### Restaurant, Food and Beverage:

- These are primarily secondary level skills and knowledge.

##### Lodging:

- These are primarily secondary level, but could go across all levels; high school level could provide the “tool kit” or entry level, and postsecondary courses address more specialized skills such as management, etc.

##### Tourism and Recreation, Amusements and Attractions:

- Both secondary and postsecondary levels can address these knowledge and skill statements.



## **Credentials/Certifications**

*What are the major certifications/credentials that we might work toward?*

Restaurant, Food and Beverage:

- All 14 ACF certification levels (American Culinary Federation)
- ProStart certification (secondary level only)
- ServSafe Food Safety and Sanitation Certification (National Restaurant Association Education Foundation)
- Certified Club Manager and Master Club Manager (Club Managers Association of America)

Lodging:

- Certified Meeting Professional (Convention Industry Council)

Tourism:

- Certified Destination Management Executive CDME (Destination Marketing Association International)

*Verify and rank current industry credentials*

Restaurant, Food and Beverage:

- All ACF credentials are the most recognized industry standard. There are 14 levels. (The national listing in the cluster manual lists only 3.)
- ProStart certification recognized, particularly by MRA/NRA members.
- ServSafe certification is used extensively.

Lodging:

- There are some certifications from the American Hotel and Lodging Association but they are really not recognized/needed in the industry.

Tourism:

- CDME (Certified Destination Management Executive) is the main one for the travel industry.

*Explore any new or emerging credentials*

Restaurant, Food and Beverage:

- Certified Personal Chef (United States Personal Chef Association)

Lodging and Tourism:

- None noted

*Consider how non-credentialed fields of study could be credentialed in Missouri*

There are lots of certifications/credentials noted for careers/occupations in all four pathways in this cluster as listed in the Hospitality and Tourism cluster booklet. The ones mentioned in Questions 8 and 9 are the main ones recognized in Missouri, as indicated by the industry representatives attending the meeting.

## **What advice or insights would you give to a student considering a career in your industry?**

*Restaurants, Food and Beverage*

- You have to be willing to pay the price and work hard to include holidays and weekends. The future is wide open, there are lots of opportunities and the salaries are good. Job security is a plus in this field. Can also take a toll on family life so you need to be sure your family will be supportive.

*Lodging*

- If you don't like people, don't apply. You need to be a problem-solver and you will work long hours and holidays. Big salaries at management levels are possible, but you have to start at the bottom and work your way up.



*Tourism and Recreation, Amusements and Attractions*

- Develop your people skills and don't go to just any school, find one that specializes in your career. Any time you have an opportunity to do an internship, you should do it. This will be very advantageous in getting a job.

***How can education and industry partner to better prepare Missouri students for this industry?***

*Restaurants, Food and Beverage and Lodging:*

- Any types of mentoring, internships and shadowing experiences are great for both students and the industry.

*Tourism and Recreation, Amusements and Attractions:*

- Have industry in as guest speakers and lecturers; secondary and postsecondary level programs.
- Many in the industry are happy to host interns.
- Relay to postsecondary students the advantages of belonging to professional organizations through student chapters, etc. It is also very good for these students to attend trade and association conferences.



## Human Services

In attendance were Lawrence Ulm, Counseling Associates of Mid-Missouri; Lydia Michell, Division of Vocational Rehabilitation; Joan Prenger, Studio 1 Salon & Day Spa; Chad Robinson and Tyler Hackmann, Robinson Funeral Home; Norma Malone, Central Bank; Marilyn Wise, Sulton & Toastmaster; Betty Brown, Missouri Economic Research and Information Center; and Lisa Evans and Cynthia Arendt, DESE.

### **Foundation Knowledge and Skills**

- Not everyone took the on-line survey, but the ones taking it stated the online survey was very easy to take.
- Several occupations need degree plus special certificate or license which must be renewed after a specific time (with continued education).
- Some fields still do not have to renew license (personal care in particular) that once you are certified that you don't have to have any additional training or continued education.
- Technology has changed, continued education is necessary long past period after licensure or certification. Employment laws can make technology vital. Also the need to document everything.
- Students who struggle in school but do well with computers.
- Young adults are techno savvy but cannot communicate. Employers need students to be able to leave the computer and relate to other humans.
- Students need to learn to communicate, verbally, written, etc., and not in instant message style. Use of computer is very important.
- Workplace is changing from face-to-face meetings to conferencing. Students have the technological skills but not the people skills.
- First impressions/body language are very important in this field. Skills should be taught.
- Problems with students that do not have stable family life and problems there affect them with academics.
- Communication skills are critical.

#### *Which do we not need in Missouri?*

- All of the skills listed were seen as important.

#### *Which knowledge and skills are missing?*

- Need more about different careers to see if this is option. For example, being a mortician is not talked about as a career option.
- A lot of jobs require entrepreneur skills and don't realize what it takes to build business/clientele. Good job counseling is vital.
- Voc Rehab – they set up site based observations to help students see what jobs are. But it is only for special needs students.
- Students need real, relative work experience.
- Mentoring/internship would be vital to help students make smart decisions in selecting a career. A lot of schools teach the technical aspects of career (in order to get licensure) and skip the actual job experience. Would like to see schools required to have internships to put students in a job environment before their graduation/licensure. (Cited example of a student [cosmetologist] who went through internship is making more than person who did not do an internship and has been out working for 5 years.)
- Seeing what jobs are actually are, job shadowing. Continuing education is very important. Every job needs at least one course in business.
- Business is moving to online – billing, etc.
- Person can't find job in area and unwilling to relocate. Find out that job is not full time or permanent, and person finds that can't live the lifestyle they want.
- Students need realistic view of jobs, what a job would make, what portion of population makes the upper levels of that occupation. (Athletes, actors, reporters, etc.)
- Organizations are getting more e-mails asking for service/product help than calls, so written correspondence and e-mail etiquette is important.



- Some mentoring/internships are done, but it is somewhat limited because of confidentiality/liability issues.

### **Pathway Knowledge and Skills**

#### *Early Childhood Development and Services*

- Not represented.

#### *Counseling and Mental Health Services*

- Agreed with the rankings—communication skills including listening very important.

#### *Family Community Services*

- Response to “Examine crisis prevention, intervention and resolution techniques to formulate emergency plans” is ranked too low for job of counselors. Counselors need to have a plan of intervention.

#### *Personal Care*

- Low responses to surveys (4). Can we draw any conclusions? Cynthia indicated part of low response was because the state associations did not have email contact information.
- Group didn’t understand why responses were that math is only slightly important for personal services. (Need to keep in mind only 4 people responded so not very representative of the professions in this pathway).
- Basics skills such as math is important in most skills in that area
- Seen as important and they all agreed was Communication 100% and time management 100%.

#### *Consumer Services*

- Overall most of group was confused as to why essential skill (Obtain a broad based knowledge in consumer products and industry equipment to allow demonstration of product/equipment features and associated uses).” not rank higher for very important by respondents. 45% of the respondents marked it as very important and 45% marked it as important.
- Their employees have data base to help answer those questions when they come in by phone or email but most know the product.
- ISTEP program – tellers are becoming sellers of bank products since they are person of first contact. Incentives are in place.
- In training program have training on product marketing because it can give another revenue path. Typically not done because schools don’t have but one product line and carrying a product for a school is most expensive part of program.
- Job descriptions may need to be updated, but job shadowing/internships can help students see what is really involved in job/career.
- Companies are downsizing and jobs that use to be attached to several people are being given to one person. Need to know all aspects of the industry.
- Entire group agreed that home-based jobs rising – but students need entrepreneur skills/communication skills. (Jobs working on projects at a computer at home, but unable to present ideas in a face-to-face with a group or individual)

Survey shows that need for communication skills in each pathway are very high.

- Everyone agrees.

#### *Which grade level should each be taught?*

- Group really looked more at the pathway charts and made course suggestions for grade levels.

#### *Which do we not need in Missouri?*

- Need all of them.



*Which knowledge and skills are missing?*

- Entire group agreed that home-based jobs rising – but students need entrepreneur skills/communication skills. (Jobs working on projects at a computer at home, but unable to present ideas in a face-to-face with a group or individual).

*Which grade level should each be taught?*

- Group really looked more at the pathway charts and made course suggestions for grade levels.

*Counseling and Mental Health*

- Secondary level
  - Basic computer skills
  - Secondary level Career and technical course for counseling and mental health (need to develop and needs to include stress management)
- Postsecondary level:
  - Time management, caseload management, business practices, marketing your skills or agency.
  - Communication skills
  - HIPPA Requirements
  - Use of humor in counseling
  - Ethical issues needs to emphasize confidentiality

*Family and Community Services*

- Case management, time management

*Personal Care Services*

- 11<sup>th</sup> grade Basic business course that includes planning out their career in their chosen area
- 12<sup>th</sup> grade: Speech and communication courses; internship programs
- High School Child Development course would be helpful
- Postsecondary: Community service project or course
- Require more than a 10<sup>th</sup> grade education for entry level

*Consumer Services*

- 11<sup>th</sup> grade computer information in place of chemistry
- communications stress public speaking
- Career & Technical Courses & content personal skills (staple skills including appearance, skills of personal services, (?))
- Information technology applications: Specialize in certain languages such as JAVA, COBAL etc.
- Search all available resources to solve problems should be a part of the introduction to consumer services course.

Postsecondary level:

- 13<sup>th</sup> Need political science in place of chemistry;
- 14<sup>th</sup> Family Economics
- Consumer Financial Services Courses include Product Knowledge
- Business procedures and communications need to include laws and legal issues; understand the importance of multi-tasking and moving quickly between a variety of aspects of the job. Be familiar with a variety of computer programs.
- Continue courses in the area of specialization such as real estate, sales, investing

**Credentials/Certifications**

*What are the major certifications/credentials that we might work toward?*

- Masters in Social Work: 2 years post graduate degree from an accredited college or university
- Academy of Certified Social Workers (ACSW) 2 years or 3000 hours in practice and passing the NASW credentialing test.
- State License to practice social work: pass test. Need 30 clock hours or 3 CEUs to maintain license.
- Masters Degree in rehabilitation counseling, counseling, guidance and counseling, clinical psychology, or clinical social work with experience in vocational counseling is also required.



- Additional fields or specialties require additional certification i.e. substance abuse counselor
  - Counseling Certifications:
    - Certified Rehabilitation Counselor (CRC)
    - Licensed Professional Counselor (LPC)
  - Consumer Services:
    - Loans
    - Real Estate license
    - Investor Services- Series 7 license
    - Insurance Sales (hospital, casualty, or indemnity)

*Verify and rank current industry credentials*

- Did not complete.

*Explore any new or emerging credentials*

- Cosmetology should break up licensure: example certification for permanent waves; certification in coloring; certification in deep tissue massage etc.
- Not sure where this fits but had a comment that Pet Grooming will require certification in the next year or two.
- Retail sales

*Consider how non-credentialed fields of study be credentialed in Missouri*

- Did not address.

***What advice or insights would you give to a student considering a career in your industry?***

- Get a part time job in the field or do job shadowing or internship early on before investing too much time in a field you decide you do not like

***How can education and industry partner to better prepare Missouri students for this industry?***

- State Department needs to have same type of format so that all trade schools follow some of the same curriculum. Maybe they already do but I find all different education abilities when hiring people for the same job.



## Information Technology

In attendance were Rosanna Bisges, Cisco Systems; Terry Bearly, IBM; Tom Brenneman, University of Missouri-Kansas City; David Olson, MOREnet; Paul Wright, DESE, Barbara Harrison, Missouri Center for Career Education, University of Central Missouri; and Leslie Kerns, DESE.

### **Foundation Knowledge and Skills**

#### *Academic*

- Surprised that English was not rated as No. 1 or “very important” by the majority of respondents.
- E-mail that is poorly written conveys a message of incompetence. Perhaps incompetence was less discernible when the telephone was a primary means of business-related communications.
- Communications are so critical; IT employees need to be able to research and prepare written summaries.
- A written paper (re: family, recent vacation, etc.) is included as part of the IT interview process at UMKC.
- Communication is extremely important to be sure customers’ specifications (given both in writing and orally) are accurately recorded. Accurate/Appropriate programming depends on accurate recordings of what the customer wants.
- Large organizations must make large equipment expenditures to support their IT needs, so good communication skills are necessary to convince purchasing departments to buy essential equipment and other needed items.
- Formal presentation skills are needed. Cisco is now starting classes for employees on e-mail etiquette.

#### *Communications*

- Programmers no longer work in isolation; they now work in teams. In general, IT positions are now approached as a team effort.
- Part of the way work is organized depends on how the company is organized. Lines of authority and work responsibilities have blurred.
- In a 1996 survey as well as a 2006 survey, IT workers were depicted by respondents as working in isolation. The general perception is still that IT employees mostly work alone.
- Instant messaging now impacts spelling and present-day approaches to communicating with others.
- Can we expect to force “millennials” to meet baby boomer standards, or do boomers adjust to accept the younger generations’ current modes of communicating?
- Add “Demonstrate ability to speak a foreign language” as a Foundation Knowledge and Skills statement in the Communications section.

#### *Information Technology Applications and Technical Skills*

- Technical applications will be obsolete in 3-4 years; it is more important that students know the fundamental concepts of a system, language, or architecture. Surprised technical applications were rated so high.
- The same concept applies to the other pathways.
- What were once new and emerging technologies are now recognized as adopted technologies. Students need to be made aware of currently emerging technologies on an ongoing basis.

#### *Systems*

- “Value stream mapping as a process” was not seen by the group as a foundational skill.
- Suggest project management be included in the Foundation Knowledge and Skills statements, not in a specific pathway.
- Recommend a new statement be added to Systems to read “Demonstrate knowledge of project management principles.”
- At CISCO, project managers are a part of Services; thus believes Project Management goes across the board.
- Higher education needs to partner with industry to provide appropriate preparation if



- certifications are not available. Partnership commitment must come from the top down. Businesses must also honor that partnership agreement by hiring locally and not looking to another geographic region of the country to find/hire new employees.
- Many IT workers do not have degrees in IT.

### **Pathway Knowledge and Skills Statements**

#### *Network Systems*

- Add: “Identify and analyze network security needs and requirements.”  
Delete No. 2: “Perform project management.”

#### *Information Support and Services Pathway*

- Delete No. 3: “Demonstrate and apply knowledge of web programming and hosting.”  
Add: “Demonstrate and apply knowledge of Internet fundamentals.”  
Delete No. 4: “Demonstrate and apply knowledge of hardware design, operation and maintenance.”  
Add: “Demonstrate and apply knowledge of system, server operation, and maintenance.”  
Delete No. 5: “Demonstrate knowledge of programming theory.”  
Delete No. 11: “Demonstrate and apply knowledge of Project Management.”

#### *Interactive Media Pathway*

- Delete No. 4: “Demonstrate and apply knowledge of Project Management.”  
Reword No. 6: “Demonstrate and apply knowledge of web programming.”

#### *Programming and Software Development Pathway*

- Add as No. 11: “Demonstrate and apply knowledge of web programming.”  
Add as No. 12: “Demonstrate knowledge of programming theory.”  
Comment No. 2: Agreed with the comments regarding certifications

#### *Needs and Expectations at High School and Post Secondary Grade Levels*

##### High School Level:

- English - 4 years
  - Math - 4 years
  - Science- 3 years
  - Foreign Language – at least 1 year
  - Business Fundamentals and IT
- Two Year Postsecondary and Four Year Postsecondary (should be the same):
- Degree plus industry certification
  - Internships and partnerships between companies and institutions for further education

### **Credentials**

#### *Which certifications are important?*

- Project Management Professional (PMP); comes from the Project Management Institute in Illinois
- Certified Information Security Certified Professional (CISCP)
- A+
- Certified JAVA Developer
- Microsoft
- CISCO (CCIE and Voiceover IP)
- Telcordia (formerly Bell Labs)
- CWIP (Consortium of Wireless . . . ) This is an industry certificate and does not come from a particular vendor
- Certified Internet Webmaster (CIW)
- Certification for Software Testers

#### *Which certificates should be deleted?*

- Novell



Note: Certification can run \$3,000 to \$12,000 per candidate per test.

***What advice would you give to a student considering a career in your industry?***

- Get their math and communication skills down. Get some work-based experience at either the high school or college level, and get into the area technical school.
- The field is very wide; your level of knowledge allows you to move around within the field. Some parts are glamorous; others are not. Try them all. IT does not exist because computers are cool; IT exists because there are problems to be solved.
- Every successful IT person I've ever met has been business and service oriented. Take a simple programming course; it's almost a prerequisite because it teaches you to think a different way.
- As early as the 9<sup>th</sup> grade, students should explore the IT field, meet and shadow someone in an IT company. This should be a school requirement for every career. Ask the company representative to be your mentor. Try for an internship; volunteer to work free. I wish there were more private and educational partnerships to provide a better idea of what IT is like.
- Students must be passionate and lifelong learners. Join open-source software from the Internet to gain some free and valuable experiences.

***How can educators and industry partner to better prepare Missouri students for this industry?***

- Instructors invite industry reps to be classroom guest speakers or to bring in a problem for the students to solve. Their solution is later compared to the solution determined by the company.
- Get industry people into the classroom, regardless of the level, to talk about how much time it really takes to address some of the needs of the industry. There is constant change that requires constant learning and education. Learning does not stop with certification.
- CIO Exchange holds monthly meetings in Kansas City. Educators could bring students to these meetings to see what CIOs are doing. Each meeting is held at a different member's facility that includes a tour. Advisory boards should be formed (particularly at the university level) that consist of industry reps—not other university staff. Above strategies help educators better understand the industry so they can better teach.
- Private companies should be joining in with educators and economic development in advisory capacity. Industry could provide "cheat sheets" of information about their field to educators and counselors. The information sheets should include websites, company contacts, etc., that could be shared with students.
- Expand on job shadowing with cooperative education or internship opportunities. Companies should be able to take at least 1-2 students during the summer.
- Internships require lots of time and effort on part of the company, but industry needs to understand the potential return on their investment. Put resource manual together that helps companies understand how to create and organize internships and how to effectively use the interns.
- Sometime employers are discouraged to consider internships due to legal/liability concerns.
- Take this a bit further to include companies/individuals who have participated in these types of efforts on students' behalf on a "list" so they are recognized and others can follow suit.



## Law, Public Safety, Corrections and Security

In attendance were Jerry Blomberg, Jefferson City Fire Department; Jason Pace, Missouri State Highway Patrol; Larae Watkins, Missouri Center for Career Education, University of Central Missouri; and Kyle Heislen, DESE.

### *Correction Services*

- Add Continuing Education- See Page 7 of Correction Services
- Minimum Requirements
  - 21 years old
  - 60 College hours
    - Or 2 years police experience
    - 2 years military experience
  - NO felony convictions or crimes involving aggression
  - No tattoos

### *Recommendations*

- Be of good character
- Even financial background
- CDL
- EMT 1<sup>st</sup> year
- Fire Fighter 1 and 2

### *Fire*

Almost all hired get credentialed after employment.  
They are paid to go through credentialing.

#### Advanced:

- Arson investigator
- Code enforcement
- Safety inspection
- Emergency management
- Loss prevention

Certifications under development

- Fire officer development (not recognized by state)

### *Law Enforcement*

In house training for Patrol  
600 hour course (paid on your own)

#### Advanced:

- Polygraph
- Accident reconstruction
- Pilot

Certifications under development

- FBI Academy
- Commercial Enforcement Division
- Homeland Security



***What advice would you give to a student considering a career in your industry?***

- Good decisions
- Good moral character
- Ability to make good decisions
- Continue to learn and research
- Continue and prepare education
- Physical activity
- Broad knowledge of physics, chemistry, math and constitution

***How can educators and industry partner to better prepare Missouri students for this industry?***

- Show practical application to their future
- Exposure to all different careers
- Job shadowing
- Career fairs



## Manufacturing

In attendance were Bruce Bird, Carpenters Training Center; Paul boatman, Fasco Motor Group; bill Crowell, Wire Rope Corp.; Harold Fear, GE Transportation global Signaling; Mark Freeback, Swisher Mower & Machine Co.; Tom Gordon, Missouri Enterprise; Holly Hawkins, Wren; Dan Kees, Regal Beloit; John Linderman, General Mills; Gary Marble, Associated Industries of Missouri; Bill Moore, 3M Electronic Solutions Division; Jeanette Porter, Quaker Oats; Brad Smith, GE Transportation; Gene Robertson, Quaker; Randy Snyder, Wire Rope Corp.; Scott Swope, ConAgra; Bob Wasson, Gardner Denver; and Ken Kerns, DESE.

### ***Foundation Knowledge and Skills***

The industry advisory council said that they found a few modifications or clarifications to the existing foundation knowledge and skills, but affirmed that many of the current knowledge and skills were important. The council made detailed recommendations on their response forms that will be compiled.

### ***Pathway Knowledge and Skills***

#### *Production*

- The Production committee agreed with most of the existing knowledge and skills.

Recommendations of knowledge and skills that might not be necessary:

- Production workers might not need to know grammar, etc.

Recommendations for additional knowledge and skills:

- The committee felt it was necessary to ensure that people can match themselves to appropriate jobs.
- Use technology to find info rather than actually knowing info because it changes so quickly.
- Understanding of how machines work.
- Responsibility – employees need to understand their obligations as an employee – punctuality, work ethic.
- Understand job measurement – why does it matter if the line goes down? How does it effect the company and employees?
- Concept of preventive maintenance
- Process improvement – troubleshooting, innovation to improve production
- Engineers and management should also be engaged in process improvement.

#### *Process Development*

Recommendations for modifications to knowledge and skills.

- 10.1 – change to meet or exceed expectations
- 10.2 – understand current processes (old and new)
- 10.4 – change implement to utilize and add tools
- 10.5 – change to business and customer requirements
- 10.7 – change needs to expectations to show voice of customer

Recommendations for additional knowledge and skills:

- Understand processes, and ability to map a process (fabricate, welding processes, molded parts, castings)

#### *Maintenance*

- Committee feels that the survey was very well constructed and covered a breadth of knowledge required for the positions.



Recommendations of knowledge and skills that might not be necessary:

- Committee feels some of the foundation information wouldn't be necessary for maintenance technicians, such as Access, Word, Excel (non-process related computer skills) or presentation delivery skills

Recommendations for additional knowledge and skills:

- Need more specific information related to mechanical, electrical drawings, blueprints, piping and instrumentation drawings/diagrams and ladder logic. They need to be able to use this information already walking on to the job.

### *Quality*

Recommendations of knowledge and skills that might not be necessary:

- Did not feel that database application is necessary in this career field. Only a very few of the students will really need them. People should know how to use spreadsheets, because it's such a basic tool that is used in most every manufacturing job. You would prefer to have your IT group build the database.

Recommendations for additional knowledge and skills:

- Communications K&S – should be more than one-way communication. Learning the ability to solicit feedback information from the presentation.
- Topic Systems – demonstrate continuous improvement rather than performance measures.
- Technology Information Applications – using e-mail applications, internet applications, writing applications – should be appropriate and effective use. Employers want to let employees know that reading chain letters, etc. is not permissible.
- Technical Skills – (not on survey) – algebra, geometry, trigonometry, physics, chemistry, biology – basics. Looking at the workforce of the future, not just today
- Work Teams – Coordinate work teams to produce quality product. Emphasize on quality as well as productivity.
- Ensure materials meet quality specifications – knowledge of statistical tools. Process mapping. Quality systems. All of these items would be very valuable to the workforce and quality management field.
- Quality has changed dramatically in the past 15 years. Written toward product quality --- rather than vendor expectations, inputs into the process. Learning how to set up quality processes – more comprehensive than just product focused. Looking at the entire process – not just company production.

### **Credentials/Certifications**

*What are the major certifications/credentials that we might work toward?*

- Apecs – Material Controls. It's usually post-high school.
- Health and Safety is becoming a big issue. Certified industrial hygienist.
- Get the fundamental skills. They want students to know algebra, trig, and then can apply those skills. I wouldn't be in favor of spending a lot of time credentialing students coming out of high school, but we need the fundamental skills. This can be taken into account by high school graduation. High school students aren't being required to perform. They're either being passed over or passed through. A lot of this also rests with the parents, not the school districts. They need to read, write, do basic math or they don't graduate.
- I think the career path is a tremendous subject because they can see the exciting places they can go. Manufacturing: It's not just where you end up. As a ninth grader, I would have loved to look at a career path and look at the opportunities. Manufacturing also needs customer service – there are so many different careers within manufacturing, it's not just geared to one field. There's a lot of explanation that can be done. It's a vertically integrated operations. They really are different than what they are 20 years ago. International interest.
- Offering some type of certificate within the clusters. Like CAD certificates.



### **Concerns and Suggestions**

- Concerned about asking students to decide the career cluster so early in high school. But, it would allow you to get into very specific training courses.
- How do you fit exposure into career clusters in an already failing school system?
- Career ambassador program – on the website. Industry bios, pictures, faces. What they do, how they started out, etc. videos, pictures of career clusters. E-mail mentors.
- Career clusters provides a context for why they are learning. Kids need direction (Mark Feedback).
- A course on “Living on \$7 an hour.” Teach them what real-life is all about. (Dan Kees)
- Look for commonalities across clusters – not just pathways. So that a health person could go into manufacturing or construction. (Bruce Bird)
- Work-keys. ACT – assessment for math, reading. (Bruce Bird)
- Really want to see it to the students, parents, families.
- Look at other countries. What are they doing?

### **What advice would you give to a student considering a career in your industry?**

- Come prepared to continually learn, because technology will always change and contribute so businesses can remain competitive. There are always opportunities to take a lead role in making the business more competitive and you’ll make yourself more valuable/marketable by being engaged in doing so.
- Never stop questioning. You never reach a point of “this is as good as it gets.” Average is unacceptable, good is just ok and you can always get better.

### **How can education and industry partner to better prepare Missouri students for this industry?**

- Industry settings. Get some exposure into industries to help make choices.
- Johnson County Training Consortium – provides (limited) customized training funds in Warrensburg. Boost funding availability of customized training funds for employees that they already have to help them grown in to further positions and obtain the information they need to be successful.
- Schools in areas need to involve subject matter industry experts in classroom instruction. Get them out of the office for a day or a week and let them expose the students to real life situations. Have them work with their vendors to bring in equipment that can be left in the classroom and used for exposure. It’s an inexpensive industry for the vendor or the company because of the increase in the quality of the employment base that it’s going to make.
- If students want to go into these career industries, get them out in the plants for tours. If they want to know what goes on in these careers, these tours can let them discover “What does that mean to be in manufacturing or to be in marketing or do marketing for a manufacturer?”
- Getting them in the plants to let them realize that they must have a GED, that they must come to work everyday, etc.
- Partners in Education program in 1993 at 3M. They have developed a mentoring program, so that the employees actually go into the classroom to be with their protégés.
- Take your children to work day – make it take “a classroom” to work day. Getting the students to actually see it, because it develops a whole new perspective of what manufacturing can be. Allows them to see the glory that might be not printed.
- Allow some type of reward (credit hours) for training courses with working professionals in the same environment. Perhaps have professionals infused in the classroom / school so they are training there.
- Have a long-term view, not short term profit therefore more aid should be given to manufactures who expose this idea.
- Educators should be encouraged to spend sabbaticals in industry.
- Both educators and industry should work together to raise the social status of a career in industry.
- Educational institutions need to make sure they thoroughly understand the skills and methodology not just textbook version.
- Develop a promotion video exposing kids to the various opportunities in manufacturing. Pitch manufacturing as a desirable career path as opposed to a job of last resort.

## Science, Technology, Engineering & Mathematics

In attendance were Ashok Agrawal, Emerson Center for Engineering & Manufacturing; David Disney, J.E. Dunn Construction; Karen Stelling, Burns & McDonnell; Mike Valentine, Thornton Tomasetti; and Nancy Alford and W. Doug Miller, DESE. All advisory participants are also on the Industry Council for Project Lead The Way.

### **Foundation Knowledge and Skills**

- Only 1 of the 4 advisors had received and completed the survey
- Surprised that “ethical and legal” was only important and not very important
- “Database applications”— maybe thought office staff would be taking care of this, so it was not ranked as important? A software application question might be more appropriate.
- Summary—seems to validate importance of these statements
- “Identify patterns, relations, and functions of an organization”—felt it is more important than ranked. Could it have elicited a different response if phrased differently?
- Suggestion to send out Science and Math again to people that this group can identify. The group offered to suggest/contact participants. Doug suggested sending it to the participants of today’s meeting to send to their contacts.
- We need to pay more attention to those who are transitioning from work retirement to teaching for our teacher force.
- Pg 7 of 12, first 3 on page—commented that no opinion was due to not knowing what those standards are.
- Surprised that “manage, develop, and improve IT tools” was only slightly important, but again may be because they have others who do that
- Felt that “demonstrate and apply the design process” should also be more important.

### *What items are missing?*

- Info on broad applications e.g. need to understand the broad fields of engineering such as mechanical, chemical . . .
- **Open-ended problem solving**
- Cross functionality of engineering
- Capstone course work—need a question if this is necessary or are you doing it?
- Model or demonstrating technique
- Sustainability, environmental concepts
- Could performance measures be added to these. If these were included, it would be easier to answer the questions.
- Suggest inclusion of integration/interdependence concept of academic areas to solve problems, such as math/science. Do they understand that engineering is cross-functional?

### *Additional thoughts:*

- Group asked for handout information from Construction and Architecture cluster to be e-mailed to them.
- There needs to be a way to provide PLTW to adult students.

### **Are there grade levels at which these concepts need to be taught?**

- Collaboration is important pre-graduation. Too often it is everyone for themselves in secondary. “Teaming” GAP
- We need extended days or school years.
- Experiential professional development is important.
- Definitely need open-ended problem solving to begin in elementary. (the open solution—no right or wrong answer) GAP
- We need to allow for exploration.—personal, local and global levels

***Are there credentials for this cluster that we need to capture?***

- Not at the high school level
- Many require engineering work experience
- There are many construction inspector certifications, but not for high school
- LEED could be learned and tested but would not be applied until later. LEED = Leadership in Energy and Environmental Design; e.g. includes “green” roofs
- ABET can have overarching concepts taught in school, but this is not an actual certification. Use the soft skills from the standards but not the ABET watermark.
- The Fundamentals of Engineering is too advanced.
- Certifications are too specialized for high school level.
- It would be unusual for a student to come from STEM and immediately go to work in the industry.

***What advice would you give to a student considering this career cluster?***

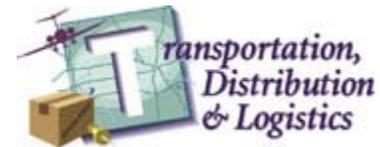
- Become aware of the possibilities in such a wide field, including specializations.
- Be aware that after working a few years that you may move into management. The industry is corporations.
- Realize the impact of engineering on all other fields. For example, the equipment in medical facilities. It touches every aspect of life.
- STEM is about improving the quality of life.
- There is a micro- and macro- aspect of engineering. You can design systems or small pieces.
- The ability to communicate an idea is number one. !!!
- The classic engineer is history because you have to communicate, manage, etc.
- Many aspects do not have failure as an option.
- It gives you the foundation to look at things differently. You ask yourself how you can make it better.
- Do you always want to know how things work, and how can you make it better?
- There are basics you have to take in high school if you don’t want to remediate at college. Take care of the 4 years of language, all the math and science you can take. Physics, chemistry, too. Per Ashok, this is true if you want to go into engineering right out of high school, but there are alternative routes.

***What are your opinions of embedded credits?***

- I wouldn’t equate one to one, but look more at the academy concept. Several courses could equal another course.
- Embedded credit might hurt the concepts of cross functionality, subjects crossing lines.

***How can education and industry partner to better prepare Missouri students for this industry?***

- I wouldn’t limit industry contacts to administrators and counselors, but include teachers.
- Involve industry in how curriculum is shifting, e.g., changes in science sequence
- Include information in education resources that include more listings of industry input.
- Develop advisory groups which include industry for districts, including Boards of Education, instead of at the program level. This ties in to serving all students instead of select groups. DISTRICT-WIDE INDUSTRY ADVISORY COUNCILS
- If you are developing all students for careers, you are enhancing the economy of the community. Impacts would address crime rates, poverty rates, substance abuse. . . . It goes to Maslow’s hierarchy of needs.



## Transportation, Distribution and Logistics

In attendance were Don Bolin, McKay Buick of Jefferson City/Auffenberg Dealership of St. Louis; Rich Echols, Missouri Auto Dealers Association; Terry Imhoff, Missouri Department of Transportation; Gregg Sisk, Sure Seal, Inc.; Lee Swearingen, Missouri State Highway Patrol Mobile Equipment Specialist (retired); Paul McKay, Missouri Center for Career Education, University of Central Missouri; and Robert Hess, DESE.

### **Foundation Knowledge and Skills**

*What do we not need in Missouri?*

- General comments given by survey respondents for this section the group felt that they were addressed in this skill section.

*Which knowledge and skills are missing?*

- A greater level of importance to developing tables, charts, and figures to support written and oral communications - the majority of the group felt that this was not a foundation skill.
- The soft skills and the knowledge of how to deal with issues, such as self confidence and problems, needs to be addressed or more effectively addressed. A separate course or topic. It needs to be an ongoing process not relegated to a grade level. This may present a problem with teachers who are overwhelmed with content to teach.
- Topics such as communication, conflict resolution, leadership skills etc. Should be listed under the section Employability and Career Development. Item # 2 in this section should be expanded to include a listing and it priority should be increased
- The need for compilation of data or a mathematics course in statistics

*Which grade level should each be taught?*

- Communications - Develop and delivering formal and informal presentations using appropriate media to engage and inform audiences. -Post-secondary Level.
- The committee agreed that the ones with the 2.0 and above are post-secondary appropriate.
- The committee agrees that the Technical skill foundations statements should all be taught at the Post-Secondary level.
- Under Systems, the Develop and manage plans and budgets to accomplish organizational goals and objectives should be taught at the post-secondary level, even though it is rated 1.82.
- Under Health and Environmental section the statement demonstrate personal commitment to safety, health, and environmental policies and procedures should be divided between secondary and post-secondary.
- Under the section Employability and Career Development items: Identify and explore career opportunities in one or more career pathways. And the statement Develop a personal career plan to meet career goals and objectives should be taught at the secondary level at an early grade level.
- Additionally the statement Identify and demonstrate positive work behaviors and personal qualities would also be appropriate for middle school.

### **Pathway Knowledge and Skills**

*Which do we not need in Missouri?*

- None mentioned.

*Which Knowledge and skills are missing?*

- None mentioned

*Which grade level should each be taught?*

- One consideration the committee asked be made that awareness is a good thing.
- Under the section Transportation Operations, these skills should be taught at the post-secondary level.



- Under the section Logistics Planning and Management Services, these skills should be taught at the post-secondary level.
- Under the section Warehousing and Distribution Center Operations, these skills should be taught at the post-secondary level.
- Under the section Facility and Mobile Equipment Maintenance the first essential skill should be taught at the post-secondary level and the second skill at the secondary level.
- Under the section Transportation Systems/Infrastructure Planning, Management and Regulations, these skills should be taught at the post-secondary level. Take a look at the problem solving foundation skills at a secondary level.
- Under the section Health Safety and Environmental Management these skills should be taught at both levels.
- Under the section Sales and Service these skills should be taught at the secondary level.
- Under the Pathway Sections Comments the group urged more insight into the need for more information.

### **Credential/Certifications**

*What are the major certifications/credentials that we might work toward?*

The committee reviewed the credential listed in the cluster book and agreed with those listed. The committee did not rank credentials probably because they could not provide this type of information.

The committee suggested these additional credentials as appropriate for the cluster:

- NATEF certification is missing.
- FCC license, may be appropriate to the Facility and mobile equipment repair
- NABER- check this name
- APCO- Association of Police Communications Officers
- Individual Manufacturer OEM certifications
- Mo state motor vehicle inspection certifications.

*Consider how non-credentialed fields of study are credentialed in Missouri?*

- Potential area for certification exists in the sales area.
- Concern of the acceptance of the credential nationwide.
- Needs to be a way of establishing a baseline for measuring competency.

### **What are the strengths of your industry?**

- Provide jobs and tax revenue
- Higher paying jobs
- Promote safety throughout the state
- Provide continuous training for our employees
- Pay for performance
- Technology based industry

### **What are the challenges facing your industry?**

- Incorporating new technology
- Workloads are heavier, a lot more is expected now than 20 years ago
- In some pockets of the state, service work is down
- Getting the industry to understand the need to be involved in the Ed system.
- The need to engage students at a younger age towards the industry.
- Input into the Ed system from a future employer. Implement a system of continuous learning.
- Students who are fully aware of the occupations available in this industry.

### **What trends are emerging in this industry?**

- Change
- Movement towards high tech and customer convenience.
- The possibility of creating the maintenance free engine and system



***Advice and insight to give to students***

- Work on your soft skills.
- Take pride in your work.
- Character is important.

***Suggestions for furthering the partnership between education and industry***

- It is a difficult process.
- Try to get input from the people doing the work.
- A whole lot of issues that relate to making it better relations between the two. Teachers, (technical) need to seek out industry input.