

NEBRASKA DEPARTMENT OF EDUCATION,
OFFICE OF CAREER, TECHNICAL AND ADULT EDUCATION
FUTURING PANELS REPORT



NEBRASKA
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MBA *Research*
& Curriculum Center

Nebraska Department of Education

MBA Research and Curriculum Center Futuring Panel Report

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Introduction and Project Overview

In the spring of 2021, the Nebraska Department of Education, Office of Career, Technical and Adult Education contracted with MBA Research and Curriculum Center to convene eight Futuring Panels (encompassing all six career fields) with business and industry partners from across the state of Nebraska. The panels were conducted virtually, in two-hour segments, across one week in April and one week in May of 2021. The Nebraska Office of Career and Technical Education recruited business partners for each of the corresponding areas, totaling 58 business and industry professionals participating across all eight panels.

Each Futuring Panel received a thorough overview of Nebraska’s Career and Technical Education Model, its current initiatives with regard to standards revisions, and additional information on program participation and statewide outcomes for students. This information served to ground the participants in their understanding of purpose and prepared them to fully engage and participate in the process.

The Futuring Panels were conducted in the individual career field areas as follows:

1. Business, Marketing, and Management
2. Communication and Information Systems
3. Human Sciences—Human Services; Education and Training
4. Human Sciences—Government and Public Administration; Law, Public Safety, Corrections and Security
5. Agriculture, Food, and Natural Resources
6. Health Sciences
7. Skilled Technical Sciences—Architecture and Construction; Energy and Engineering; Manufacturing
8. Skilled Technical Sciences—Transportation, Distribution, and Logistics

Futuring Panel participants were asked to provide their perspectives on forward-thinking trends and issues affecting their specific career cluster. They also provided input on related skill sets and, where applicable, emerging occupations.

After discussing all of the current trends occurring in their business or industry, participants were asked to identify which of the trends they considered to be the top or most critical trends occurring now.

With regard to top trends, the following themes emerged across all eight panels:

- Pace of change in technology impacting work overall
- Changes in technology specifically impacting communication
- Remote work and remote learning—changes here to stay

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- Labor and pipeline shortages and the need for marketing to recruit and communicate opportunities
- A focus on diversity, equity, inclusion, and access
- Increased focus on sustainability
- Increased need for ethics

Accordingly, the following related skill sets emerged as themes across all panels:

- Adaptability and independent learning
- Resiliency
- Digital and face-to-face communication skills
- Innovation, creativity, and collaboration
- Digital marketing
- Data analytics/Data science
- Diversity and cultural awareness, sensitivity, and social responsibility
- Emotional intelligence
- Increased need for emphasis on ethics in the workplace

Quality Work-Based Learning in Nebraska

Following the trends discussions, participants were asked to discuss their knowledge of and experience with work-based learning (WBL) in Nebraska. Specifically, they were asked to share their views on what makes a quality WBL experience and what student readiness looks like for students to fully reap the rewards of work-based learning.

Career-Readiness Skills in Nebraska

Finally, each panel spent a short amount of time reviewing a high-level snapshot of [Nebraska's Career Readiness Skills](#), and did a quick validation of the skills included and suggested new skills in light of identified trends.

Note: Participants represented their own views, not those of their employers, businesses or organizations.

Trends Panel: Business, Marketing, and Management (April 27, 2021)

Business and Industry Participants

1. Erin Rea, Union Bank
2. John Morey, Morey & Quin Wealth Partners
3. Stephanie Hand, Lutz
4. Jennifer Davidson, UNL
5. Kelly Lammers, Nebraska Department of Finance
6. Karen Gibler, Chamber of Commerce
7. Fayrene Hamouz, Restaurant Association, ProStart Program
8. Chris Kalkowski, FNBO
9. Phil Green, City of Papillion
10. Sherry McCrain, Restaurant Association, ProStart Program

Top Trends and Related Skill Sets

Trend: Changing Modes of Communication

Communication changes elicited a lot of conversation. The following discussion points were shared among the participants:

Communication is becoming more complex and more personal. Advancements in technology and accessibility to technology and varying applications are making things more complicated. The employee who can switch rapidly between communication modes and mechanisms—knowing which to use when—is able to keep communication personal and individualized to meet stakeholder needs.

Communication preferences among customers and other stakeholders are different, and the need for the employee to identify or discern those preferences and to adapt to different stakeholder needs is important.

Employees must also be adept at communicating while using the different modes of communication.

The ability to make the complex (large amounts of information) simple or clear for the client is needed. One specific example noted is that more people are moving to technology; in banking, away from in-person banking.

Skills Needed

- Emotional intelligence: Awareness of communication preferences—ability to ‘read’ the customer. Nonverbal communication is important.
- Adaptability: Fluidly adapt to different stakeholder communication needs
- Flexibility with technology: Adept at using different technology and ability to stylistically communicate differently depending on type of technology used
- Make the complex simple: communicate clearly and concisely; ability to translate and condense large amounts of information for simplicity and clarity

Trend: Speed of Acquiring Data and Information Consumption

This was a discussion about the overwhelming amount of data that everyone has access to today (both businesses and consumers) and that making decisions with little depth of understanding is a trend but not a positive one.

Using marketing (especially social media and digital marketing) simply as a feedback loop to customers is problematic from an ethical standpoint if the information lacks depth, is inaccurate, or doesn’t provide value for the customer.

“Business is acquiring data on people to feed it back to them [and this] solidifies their opinions. How do you help employees think more deeply?”

“Information doesn’t equal knowledge; knowledge doesn’t equal wisdom.”

This trend discussion had a cautionary tone, implying that we need to be more disciplined, judicious, and accountable in using data. We should not use data simply because we have so much of it readily available to us. Using data to support our subjective opinions is causing us to become more polarized. Further research and processing of information is recommended before sharing or using in marketing and business decision-making.

Skills Needed

- Processing of data into intelligent information that delivers value—not redistributing raw (and therefore possibly flawed or invalid) data
- Judicious and ethical uses of data; not acting too quickly after acquiring data and not feeding data back to consumers to confirm interests and beliefs based on data gleaned from those same sources

- Measured and thoughtful application of data in marketing and business decision-making
- Resisting use of unprocessed data to support radical ideas and/or ideologies
- Willingness and open-mindedness to find additional information to support other perspectives on an issue
- The need to look for more depth of data and from trusted sources

Trend: Growing Need for Data Analysis

The discussion points around data analysis were that the availability of data continues to grow and data analysis, therefore, is important in any business occupation. The needs center around the ability to process information and use critical thinking skills. Employees need to understand how to read data, comprehend it, and interpret it for others. The ability to prioritize data (due to the volume available) and make it concise and actionable are also parts of the data analysis process.

Skills Needed

- Ability to process data/critical thinking skills
- Ability to read the data: comprehend it; interpret it for others, distill it down or make it actionable, and then prioritization skills to determine best actions to take based on the distilled information
- Ability to find or create efficiencies— understanding why something is done and how best to do it

Trend: Increased Drive To Automate

Automation is creating efficiencies in many settings. More bots are being used, for example, to automate taxes. Making the output of information digestible for the client is important i.e., translating complexities into understandable information.

Skills Needed

- Ability to find efficiencies; understanding the why [we are doing something]
- Ability to make the complex simple
- Problem-solving

Trend: Increasing Need for Agility

There is a need for flexibility and responding quickly to change i.e., the ability to pivot and knowing how to get to the desired end result. There should be a growing comfort with ambiguity and making quick decisions sometimes based on incomplete information.

Skills Needed

- Ability to provide feedback that's solution-oriented
- Flexibility with technology
- Decision-making and the ability to pivot

Trend: Remote Work and Remote Education Technology Skills

The discussions around remote work included changes in program delivery in education. Educators are receiving information and being trained differently as well as delivering content (teaching) their students differently due to advancements in remote technology and online learning. Even with all of these changes, educators are also continuing with face-to-face teaching.

There are opportunities to reach more people with remote learning.

Professional development is now integrated into the workday for many people.

Remote work is seen as being mutually beneficial when structures are in place to engage the employee and the employee is well-suited for remote work.

Skills Needed

- Systemic delivery of programming
- Self-motivation; less hands-on management/direction/guidance for the employee
- Time management skills
- Overall flexibility—not rigid or unable to adapt
- Professional development integrated into the workday
- Communication skills and comfort with the different tech for communicating remotely; using the one that best suits any given situation
- Accountability
- Engagement; still participating as a member of a team
- Management skills—to motivate and engage others
 - Motivation techniques for managers to engage remote employees
 - Team building to address isolation and a lack of connectedness

Trend: Increasing Spotlight on Mental Health and Well-Being

The discussion about mental health was that businesses are dealing with mental health issues with their employees and with their customers. The topic of mental health was once not discussed in the workplace and now it is becoming commonplace. It is a necessity to address the issues of mental health directly and to engage in discussions and support plans for employee health and safety.

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Possible emerging occupations in this area of mental health were mentioned. Training, awareness, and support for mental health in the workplace are becoming necessary. Businesses will need employees to support these emerging needs and to conduct training and development in the future.

“We have to be ready to take care of our people.”

Some of the reasons noted for mental health coming to the forefront are:

- Work-life balance due to remote fatigue
- The effects of the pandemic on people across the entire spectrum of roles
 - Students, teachers, workers, frontline staff, parents, caregivers of elderly parents or disabled family members, nursing home staff
- The effects of the social and political upheaval around DEI issues

Skills Needed

- Work-life balance and self-care: Knowing how to care for oneself to prevent burnout
- Time management

Trend: Greater Attention on Diversity, Cultural Sensitivity, and Inclusion in the Workplace

Governance, communication, who we're hiring, who we're doing business with, customers, etc., are all shaping the need for workers to come with a grounding in cultural sensitivity and an awareness of others that is inclusive, respectful of differences, and embraces diversity for what it brings to the table.

The world is more global and diverse. Students need to be able to communicate with people who are different from them. They need to realize that different perspectives (other than their own) can also be true.

Communication of policies and policy changes is important.

Skills Needed

- Cultural sensitivity and awareness
- Acceptance and embracing of differences
- Understanding bias: Implicit and explicit

Additional BMM Trends Identified and Related Discussion

Trend: Income and Wealth Gap Increasing

It is important to equip people to function financially in the world. Students need to know how the economic system works. Basic financial literacy is important for employees to function in their jobs. Financial literacy at every stage of one's life and career is important.

Trend: More Rapid Pace of Change (Driving Adaptability and Innovation)

COVID-19 and other recent large-scale disruptions (climate change, social and political activism) have impacted every part of business. Being able to adapt to the next big challenge has become important for survival of businesses. Innovation is being driven by these large-scale changes in society, the environment, and the global economy. There is a need for employees to figure out what the end result needs to be and how to get to the end result. Learning new skills to adapt to new needs e.g., people becoming certified immunizers at Walgreen's.

Skills Needed

- Adaptability and comfortable with change
- Innovation
- Decision-making and the ability to pivot quickly under pressure
- Problem-solving
- Professional development for long-time employees (re-skilling/upskilling)

Trend: Going Green/Sustainability

It is important to make students aware of the opportunities in this growing area. Solar farms were one example that was mentioned.

Trend: Students Dropping Out of College—Not Completing 4-Year Degrees

Certifications are available for many careers or as career stepping-stones while deciding whether to complete a 2-year or 4-year degree program. There is a need for educating parents that there are other career opportunities that do not require a 4-year degree. People are starting to diversify their education by looking at and participating in experiences rather than at a specific educational path. CNA and Journeymen were both cited as examples of certifications/apprenticeships that are increasing.

Trend: Labor Shortages/Robotics

This trend was discussed specifically within the restaurant and food industry but there was some agreement across industries as well. Employers are desperate for employees and will work with diverse skill sets.

There was a discussion about more robotics being used in this area and that it is somewhat being driven by the labor shortage but also by customers expecting a certain degree of convenience.

It was acknowledged that bringing employees back will require marketing and incentives, and that these are most successful when providing tuition reimbursements or scholarships for education.

Skills Needed

- The ability to adapt to change, and do it quickly—sometimes only five minutes involved in decision-making
- Addressing the demand for more convenience
- Automation

Trend: Changing Regulatory/Legal Considerations in the Workplace

Regulations build on other regulations so it's important for employees to come in with a base knowledge of regulations in their chosen career field so that they are able to see the big picture once they are employed and working in specific industries. They need to be able to cross-reference the content. It is important to stay abreast of changes in regulations once they are in their career—ongoing professional development is necessary.

Skills Needed

- Ongoing professional development to stay up to date with regulations.

Trend: Greater Drive for Teamwork and Collaboration

Communication is critical when working on a team and collaborating with others. One needs to be able to prioritize important ideas and information and share those with one's team members.

Trend: The Rise of Cryptocurrency

There was a consensus that cryptocurrencies will change a great deal of business interaction in the near future. There will be a need to hire people who can articulate a discussion with artificial intelligence. Communication and inclusion will be a need in this area.

Skills Needed

- Understanding block chain technology and the use of block chain methods
- Artificial Intelligence
- Communication and inclusion (computer language) will be a need

Trend: Continued Need for Digital Responsibility

This was a brief discussion about the ongoing need for students to use social media in responsible ways because of its lasting imprint on their reputation and therefore, the impact it can have on their future careers. One of the first things a hiring manager does (when screening applicants) is to look up the applicant on social media to view their activity on different platforms.

Trend: Continued Growth of Digital Marketing

The discussion for this trend focused on the immediacy of consumer needs/connecting in real time/delivering information, products, and services in an on-demand environment as customer expectations for immediacy continue to grow.

There was some discussion about the need for communicating value versus cost so that customers are not only comparing prices online but also considering quality. It's important to convey that quality materials, products, and service matter. All of these elements contribute to overall value and have related costs associated with them.

"Communicating the value of value. Price is what you pay, value is what you get."

Skills Needed

- Ability to make metric-driven decisions
- Ability to Communicate value
- Connecting with people where they are and delivering (literally and figuratively)
- Responding to what the consumer wants in the moment

Trends Panel: Communication and Information Systems (April 28, 2021)

Business and Industry Participants

1. Bob Herrera, Mutual of Omaha
2. Shubhra Kejriwal, Gallup
3. Gray Knowlton, Compass Group, Omaha
4. Keegan Korf, AIM Institute
5. Jona Van Deun, Nebraska Tech Collaborative
6. Bryan Kuntz, Kearney, Intelecon
7. Mark Leonard, NET
8. Kyle Murphy, Hudl
9. Brain Sterud, Health Services in Norfolk
10. Jessican Barry, Conagra
11. Michelle Friend, UNO
12. Paul Feilmeier, Northeast Community College
13. Molly Curnyn, Wayne State College

Overall Trends Discussion Points

The Communication and Information Systems Futuring Panel opened up almost immediately with a conversation about a lack of workforce pipeline, specifically in Information Technology (IT). The pipeline discussions continued throughout the course of the panel and were woven into nearly every identified trend that followed as if the pipeline shortage could not be viewed separately from other IT trends.

The pipeline conversation dovetailed into many discussions about diversity both as part of the solution to some of the pipeline issues and as a challenge that needs to be addressed in the current workplace. Panelists identified that workplace culture needs to change in order to attract and retain a diverse workforce.

There was much call for systemic change in trying to solve the pipeline shortages and to address the lack of diversity, equity, and inclusivity in IT careers. Because pipeline was such a big trend discussed throughout the panel, many of the comments naturally lent themselves to also being applicable to work-based learning feedback.

The other two trends that were emphasized throughout the discussion across trends were communication skills and ethics skills that are currently needed in the workforce and for career readiness.

In terms of trends requiring technical skills, it was noted that the top discussions happening with CIOs today are the need for people who understand cloud, cyber security, and data science.

Finally, quite a bit of complementary conversation occurred in the Zoom Chat. There we captured book title recommendations in response to DEI discussions, emerging occupations in tech, and additional technical skills as they related to the emerging technical trends.

The Communications career field was not as fully represented as IT, so we followed up with Mark Leonard at NET to help us better understand some of the feedback that he provided during the panel. This additional information helped to round out the information in this area.

Top Trends and Related Skill Sets

Trend: Shortage of Talent in the Workforce Pipeline

There is a huge demand and therefore much opportunity for employment in technology careers as the existing pipeline is not meeting the needs.

There was a good amount of conversation around marketing and ways to better communicate about the availability of jobs in this area and how to communicate that Tech exists across all career clusters. One example was in a food company. But other examples included healthcare, business, music, sports, etc.

Also, they stressed the need for broadening the understanding about the types of roles available. In addition to coders, developers and engineers are needed.

“There are a lot of coders but abstract and complex problem solvers who work in development and infrastructure are much harder to find.”

The ability to provide accredited certifications for web developers is there but the workforce also wants additional experience and internships, so there is a gap. When asked whether industry is giving feedback, it was noted that there is a need for the conversations to be happening but they’re not quite there yet. Some professional development is being provided at the industry level but knowing where to find those skills is important (for employees).

Smaller teams/companies/organizations still need entry-level workers to have tactical and technical skills coming into the jobs—they don’t have the resources to teach those skills to new workers.

Experiential learning via internships was stressed as being the most important element to success in these career fields.

Feedback on Internships in IT

1. Internships are really important and there are not enough out there for students to take advantage of, especially in rural areas.
2. There are not enough students going into the pipeline in general; not being able to attract within the state in the same way that other states are able to do.
3. UNK is requiring a 460-hour internship with IT students and this is preparing them for the workforce but they don't have enough students entering the program; lack of marketing for getting into tech careers at the 9-12th grade level, especially in rural Nebraska.
4. Experiential learning, internships to gain experience in the workforce, are a must; many people mentioned internship requirements so that students would be engaged in seeking them out.

"We have good luck attracting interns from Nebraska schools, where we slowly introduce them to things like team-based development projects, contributing to code branches, etc. We start very small on simple configuration changes, and build people up through experiences. A required competency for senior developers in my organization is to mentor entry-level students."

Trend: Diversity Viewed as a Pipeline Solution

There was much discussion that there is not enough diversity/POC/women in the pipeline. There is a need for more inclusive marketing and policies to attract a more diverse pool of people.

There is not just one job title available for tech and we need to explain this better to make it more appealing to a more diverse pool of students.

There is a lack of diverse role models to encourage students to enter into this field. Young workers today really want to work for a company that they feel represents their values and is doing important things in the community. They aren't willing to put up with toxic work environments or companies that aren't aligned with their values.

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“The culture has to be truly welcoming of diverse people, not just people who look diverse but still need to act like the dominant (white male) culture.”

Issues around recruiting include LGBTQ+ and rural versus urban populations. There is a big opportunity to capture more and different communities but currently there’s a big disconnect to the students. How to communicate that there is a place for everyone in the ecosystem of tech jobs is the issue.

“We are leaving many kids behind in our own communities.”

Resource Recommendations Related to This Trend

1. <https://www.goodreads.com/book/show/38212110-technically-wrong> (Keegan Korf)
2. <https://www.amazon.com/Code-Debugging-Gender-Danielle-Feinberg/dp/B01M29SVPK> (Kyle Murphy)
3. Step Up Omaha: <https://stepupomaha.com/> (Shubhra Kejriwal)
4. FBLA and SkillsUSA offer Information Technology opportunities through competition for junior/senior high school and college students.

Trend: Need for Diversity, Equity, and Inclusion Changes in the Tech Work Culture

The world is changing and so are cultural norms. Inclusivity is necessary for companies to grow, to populate the workforce pipeline, and to retain that diversity in the workplace. Workplace culture needs to adapt to become more welcoming, less exclusionary, and have more opportunities for women and people of color to ascend into different roles and at higher ranks. If we only work on getting people into the pipeline but don’t change the workplace culture, the new talent will not be retained.

Women in Technology Careers Discussion

There is an ongoing ‘pink-collar’ trend happening for women in tech. The issue of who gets to be here, what roles they end up in, and how much money they make are all issues for women in tech careers. The messages they’re receiving once they’re in a tech position or company are not always encouraging or inclusive.

There is a lack of retention of women because they don't always feel welcome or comfortable, or have options for advancement. There are opportunities to get into tech but once they arrive, there's nowhere to go or they may be dealing with toxic work environments.

In hiring, the skills required for a job need to apply equitably to both genders. If a man can come into a tech position with foundational work skills and no technical skills, this needs to be the same for women in that same organization. Currently, more often, women need to prove both.

Large companies are able to invest more in talent; small companies need more employees with actual experience.

Trend: Increased Need for Skill Development in Cloud Computing

"The cloud is everything in IT right now." It's hard to find expertise in Cloud across all areas of IT at the moment (marketing, sales, IT, security, etc.). The curriculum for learning cloud computing is also new so there's not a lot of depth of knowledge or experience in new employees.

"It is hard to find employees knowledgeable in using, operating, and developing Cloud computing IT. Software engineering is also needed."

Tactically, cloud computing competencies revolve around three basic areas:

1. Operations Management (Business)
2. Development (Finance)
3. Security (Tech)

Adjacent skills to the above:

- Business analysis
- Product strategy
- Finance for tech

Trend: Transition from Legacy to Emerging Technologies

A big trend within cloud computing is the transition from legacy system admin roles (SysAdmin) to development operations (DevOps) roles, where most infrastructure management is now done in development tools rather than legacy IT management tools. And companies and organizations are in between these two places right now and need employees who are flexible to use and manage both.

Trend: Continued and Increasing Need for Cyber Security

Cyber security is not a new trend but it is a continuing trend and is growing in importance and availability of positions. Cyber security is a broad term that covers everything from how to protect data and infrastructure to what happens when something breaks or is exploited in any way. Cyber security experience does not happen without internships.

Trend: Continued Need for Data Analytics and The Rise of Data Scientists

The increase in data is creating a need for data scientists in all areas of employment.

Skills Needed

- The ability to tell a story with data continues to be a strong need; decisions are based on data.

Trend: Communication Styles Shifting as a Result of the Pandemic

Virtual communication (Zoom) and telepathy changed so much due to the shift to remote work. There is currently a lack of experience in this area (virtual communication) due to rapid changes brought on by the COVID-19 pandemic.

There is starting to be a lack of professionalism in virtual communication. Even though it's not face-to-face, it's still professional communication and needs to be taken more seriously.

Different channels are less formal (IMs) but still professional, especially when dealing with sensitive information. How can we maintain professionalism within these other channels?

Skills Needed

- Sensitivity/Professionalism/Respect
- Face-to-face communication still dictates success; it is still imperative that employees can communicate well in-person.
- Employees also need to know how and when to pick up the phone and communicate that way.
- Communication acumen in project management and teamwork
 - Knowing how to keep people informed and how to prioritize information and changes to work orders, etc.
 - Tech has its own language that people need to learn and understand: What is the problem? What is the solution? And being able to communicate to those questions. Also, literally, the language or specific terminology that is used in IT. This is why internships and experiential learning are so important.

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It was acknowledged that communication skills are always important in any/all areas of study/workplace. The skills that were mentioned generally with regard to communication were:

- Writing (basic writing skills)
- Professional ‘voice’
- Specificity in change requests—being as detailed as possible to convey all the relevant information, especially when working on a team
- Understanding the language of the business/ability to speak in the common parlance
- Project management skills
- Accountable to stakeholders

Trend: Increasing Need for Ethics Skill Sets

- Personal and professional/Critical reasoning/Responsibility
- Discerning sensitive information
- Security/Confidentiality/Honesty/judgment
- Taking responsibility/Accountability/Failure is okay

Additional CIS Trends With Related Discussion Points and Skill Sets

Trend: Increase in the Diversification of Media/Tech/Journalism

The media/tech/and journalism areas are in a dynamic and changing place. Access to content is continuing to diversify across multiple content distribution platforms with things like video streaming (OTT), podcasts, augmented reality, virtual reality applications, and gaming.

The days of broadcasting TV and radio with each having only one stream of content are over.

Now, media producers are programming and broadcasting content for TV multi-casting (sometimes with four or more separate streams of television programming) and two or more distinct program streams for radio.

“With this explosion of distribution platforms, audiences have remarkable access and control, but monetizing the audience becomes more challenging.”

Media is also experiencing the changes that we noted earlier in a top trend with regard to legacy systems moving to emerging and developing technologies. The needs of the workforce are continually evolving in media; therefore, adaptability and ongoing learning will be required.

“Finding people who understand the legacy technologies while mastering emerging applications will be a challenge.”

Trend: A Lack of Fact-Based Journalism Creates Problems for Our Democracy

A lack of understanding and discernment around fact-based journalism (differentiating fact from opinion) is putting our democracy at risk. The growing amount of and easy access to disinformation without a fundamental understanding of fact-based journalism is causing harm to our democracy and to our democratic processes.

News and journalism are at inflection points in our country as a result of changes to the business model for news content. The loss of [the fairness doctrine](#) in the 1980s and the expectation that news divisions be profitable have led to serious declines in both broadcast news and newspapers.

The expansion of nonprofit journalism offers some hope, as does blockchain technology enabling subscriptions to trusted content providers and independent journalists.

“A free press serves as the surrogate for the public, asking the hard questions of public officials on behalf of citizens.”

Skills Needed

- Critical media literacy skills
- Learning journalism from a civics perspective

Trend: Emerging Need for Overall CRM Literacy

All roles need this knowledge now as CRM emphasis continues to evolve and grow. Every type of business is using a CRM now and so the demand for these skills is high in almost every area of business.

- Sales/Service/Customer service/Fundraising

“What a game changer it would be if every student knew how to use a CRM right away. It’s in everything we do; that’s how companies are evolving.”

Trend: Pace of Change and Worker Ability to Stay Current

Inexperienced developers seem to be having difficulties keeping up with new technologies. Businesses don’t have time to hand-hold new employees to keep them engaged and working on their skills. And if they don’t stay up to date, it’s easy to fall behind quickly due to the increased pace of change with new and emerging technologies.

There is a curiosity missing from the workforce that is coming in. Businesses are asking what their responsibility is for upskilling and reskilling people.

Businesses are offering some ongoing professional development but people need to explore other options like using Coursera, which is more independent learning.

Because technology is by its very nature always changing, the people who are most successful in this field are those who have a genuine desire to learn the ‘next’ thing. They are naturally curious and interested in staying current and doing some of the work themselves to learn new skills and to try to keep up with the changes in tech.

Skills Needed

- Self-motivated drive
- Curiosity-driven for continuous learning
- Strong work ethic

Trend: Increased Use of Digital Portfolios for Hiring

Proof of digital assets to assess candidates are more important than résumés. GitHub Portfolios was mentioned. Examples of assets include:

- Websites
- Open-sourced code
- Volunteer time
- Internship
- Tangible artifacts

Someone noted that digital portfolios are problematic for DEI issues, since in order to have those digital assets, one would need to have had those experiences and be in the environments to develop those assets. If minorities and women aren't getting those opportunities, requiring or prioritizing digital portfolios becomes another barrier to entry for these individuals and increases the likelihood of pipeline issues and a lack of diversity. (See also: Diversity/Women in Technology Careers)

Trend: Need for Mentoring the Younger Generation (School to Work Transition)

The younger generation wants more frequent and specific feedback on performance. Giving them true feedback will go a long way toward keeping them engaged and developing them to continue successfully in this career area.

On the other side, it is necessary for early career workers to understand the transition from being in school to the world of work. Work involves more experiential learning rather than a checklist of accomplishments that one is stepping through and expecting affirmation for each milestone. Individuals need to develop their own sense of accomplishment and satisfaction based on their work ethic rather than always looking for positive reinforcement. And businesses need to give more regular feedback, understanding that this generation is looking for mentoring and regular connection/feedback to understand how to improve.

Trend: Increased Need for Soft Skills in Healthcare Tech

There is a need for soft skills in healthcare because of all of the sensitivity involved and need for privacy. Healthcare prioritizes those skills and is more willing to train for hard skills if they can determine a basic aptitude for technology. Sometimes there is a lack of understanding around confidentiality in handling personal information or in dealing with varying cultural norms. This area (of Nebraska) may need to catch up in this area in terms of training.

Skills Needed

- Ethics and ethical behavior
- Cultural sensitivity
- Respect for privacy and confidentiality

Skill Sets That Cut Across All Occupational Areas in Communication and Information Systems

- Logic/Reasoning/Problem-solving skills
- Willingness to be a continuous learner/Self-motivated/Natural curiosity
- Not expecting extensive knowledge in cloud for entry workers. Interest in this area is good but some of the foundational work skills are more important (in larger companies)
 - Gender perspective: Women may need to show they have more concrete skills in addition to the soft skills
- Understanding some of the evolution of tech will assist employees in their careers.
- Having a grounding in history or philosophy allows students to be good at synthesizing information that comes up in the workplace.
- Persistence in using logic to solve a problem
- Risk-taking ability/Decision-making/Independent thinkers
- Willing to make mistakes/take accountability/have experience with failure
 - Gender perspective: There can be a double standard for women and diverse populations with regard to making mistakes/being able to fail safely
- Customer service and stakeholder accountability

Emerging Occupations

- Machine Learning
- Cloud Architects
- Data Management/Data Governance professionals
- Scrum Masters
- Project Management Product Owners/Portfolio Managers
- Business Intelligence Analyst

Certifications

- AWS Certifications
- Azure
- Kubernetes

Curriculum Resource

- <https://dschool.stanford.edu/resources/getting-started-with-design-thinking> (recommended by Kyle Murphy regarding principles and practices of human centered design)

Trends Panel: Human Sciences—Human Services; Education and Training (April 29, 2021)

Business and Industry Participants

1. Carol Erwin, Wayne State College
2. Jeanne Bietz, NE DHHS, Public Health
3. Sharon Obasi, UNK Family Science
4. Peg Ogea-Ginsburg, DHHS
5. Lisa Schulze, Women’s Fund of Omaha
6. Katorra Enoch-Longshore, Nonprofit Early Childhood
7. Mike Feeken, First Five Nebraska, Early Childhood
8. Joe Harari, Windows Wear (grant research company)
9. Wendy McCarty, UNK Transitional Program Director
10. Jennifer Johnson Jorgenson, UNL Consumer Behavior
11. Sherry McCraine, Nebraska Restaurant Association
12. Kay Reed, Dibble Institute
13. Kelsey Andrews, All About U Adoptions
14. Krystal Kolb, Consultant

Top Trends and Related Skill Sets

Three of the top trends that follow (inclusive leadership, mental health, and designing work for well-being) all had overlap with one another even though people named them differently or referred to them as separate trends. The discussion points and related skill sets that were raised for each individual trend blend and cut across all three areas and can apply to multiple trends. Bearing this in mind, we chose to report on and present them as they were stated and discussed in the panel. Skill sets cited under each individual trend, therefore, reflect some redundancy across trends.

Trend: A Move Toward Inclusive Leadership

There is a need for ethical and inclusive leadership and for agencies to explicitly state and publish their core values. It is imperative that organizations define and strategically place their core values for maximum visibility.

Skill Needed

- **Accountability:** Are the core values aligned and being used consistently in interactions with all stakeholders?

Trend: Increased Need for Mental Health To Be Addressed in the Workplace

In response to the dual public health crises of the pandemic and race equity, there is starting to be an awareness of (and response to) integrating mental health and wellness in the workplace. There was an observation that women in leadership are driving or fulfilling the response to this trend.

Skills Needed

- Leading with emotional intelligence
- Operationalize workplace flexibility
 - Paid family medical leave for all genders
 - Unlimited PTO (IT and Tech are creating remote work flexibility)
 - Managers have to encourage employees to take leave
 - Providing autonomy for staff
 - Leading the way in nonprofits
 - Paid medical leave for families
- Women in Leadership are addressing racism, discrimination, working with others
 - Pandemic of COVID-19
 - Pandemic of Racism
 - Decentering 'white-ness' and binary thinking; black/white thinking dismantled
 - Self-compassion in a toxic world
- Prevention tactics and skills
- Trauma recognition and response (ACEs was mentioned; see trend in 'Additional Trends' section)
- Understanding biases
- Cultural sensitivity
- Creating space for bringing one's authentic self to work, acknowledging that everything is interconnected
 - Employers need to think about making the environment reflective of the needs of their employees
 - Giving space to encourage self-care and self-advocacy; a need to de-stigmatize these issues
 - Moving away from work-life balance to a fuller integration of wellness
 - Emotional support for educators so they can then support students

Trend: Designing Work for the Well-Being of Workers

There is a move towards designing work and workplace policies to recognize the need for the overall well-being of workers.

The primary issues center around family-friendly policies, and personal work-life balance, establishing appropriate boundaries and support for the personal and the professional.

There was a question about work-life balance being possible and why we have expectations of this or when we have seen this actually happen in our history. The answer was that it existed before the big shift to both parents working outside the home. It is a financial necessity now in most families to have two full-time incomes and this makes work-life balance difficult or impossible so companies are stepping up to help define or redefine this.

The pandemic highlighted the need for businesses to solve some of these issues until they can be supplemented or resolved through legislation around issues like universal childcare, eldercare support, and the adoption of a living wage versus minimum wage.

Trend: The Impact of Technology on Communication

The shift from in-person learning and working to virtual and remote has caused some breakdowns in communication. Students are so reliant on and immersed in their technology, it is causing some decline in collaborative and interactive skill sets with fellow students. Additionally, educators are struggling to engage students and to maintain their attention in this tech-dominated learning environment.

Career-readiness skills are lacking around virtual communication. Communication in this area traditionally comes with higher expectations since it's human services, so this is definitely a trend that needs to be addressed.

A level of professionalism has been lost in moving to virtual and remote. There are varying tech tools that require different styles of communication. This all leads to a need for adaptability. Tone, interpretation, and conveyance are all pieces of this new communication environment that need to be addressed.

Sensitive information is now being handled online and there is a need for privacy, safety, and sensitivity to handling the information itself and safeguarding personal data.

Communication needs to have clarity, and now often, needs to have visuals created to supplement the writing and speaking.

Skills Needed

- Collaboration and interactivity (teamwork) skills
- Online engagement skills in a tech-heavy environment
- Adaptability: Navigating formal versus informal tech tools/communication styles
- Navigating sensitive information online: Safeguarding data and information
- Emotional intelligence: Cultural sensitivity and awareness—comfort in a multi-generational workforce
- Business writing is important: Clear and concise
- Visuals (content creation) to supplement written and spoken communication

Additional HSET Trends, Discussion Points, and Related Skill Sets

Trend: Technology Shifting from Optional to Necessary—Remote Work Is Here To Stay

The proliferation of technology in our lives was discussed in many different contexts. Technology is impacting all of us, in both positive and negative ways, across all areas of our work, education, and personal/home lives. Because technology is being used for everything from work, to education, to entertainment and personal use, there are some challenges in knowing how to manage it. Trying to keep things separate may no longer be viable but we may be able to teach students and employees how to find a balance with regard to tech tools usage.

There may be a need to address the juggling of roles when using tech as a consumer, as an employee, as a teacher, as a student, etc.

Other Tech Observations

There can be assumptions about skills based on age and these are often incorrect.

Data and access to information is ubiquitous to everyone. Using social media as a source of education and news can be problematic. Understanding how to identify trusted sources in the online world is important.

Positively, the increase of online learning has created high-quality experiences and some elimination of barriers to further education. Collaboration to serve language learners, increased professional development, and equitable pathways are all positive outcomes to this trend.

Skills Needed

- Comfort with remote technologies for work and education
- Navigating work-life balance while working/learning from home
- Discernment of trusted online sources
- Self-care and personal/family issues (AEP)—teaching these in schools
- Self-management, self-motivation, asking for help
- Confidentiality ensuring sensitive information is private and secure

Trend: Outdated State Regulations Impacting Human Services and Communities They Serve

There were delayed updates and delays in prioritizing adoption or FCS. Childcare licensing is not up to date due to this, and this affected student placements and eligibility in internship placements. The regulations are not reflecting or keeping pace with today's world.

There is carry-over for this topic into the political world. It depends on the current administration in terms of which issues they focus on. There is a need for students to understand how government works. There is a disconnect between knowing how government works and what local businesses can do to update the regulations.

Regulations and laws affect, for example, students with disabilities, children in foster care, juvenile delinquency, etc. The advocacy space is important with this topic but the decision-makers (legislators) aren't always listening to the advocacy groups. They want to hear directly from constituents but constituents don't always understand the policies or have time and access to give feedback to elected officials.

There is a need for a policy leadership academy to help people identify where to find data and how to create messaging.

There is a need for teaching civics and how government works.

"This is where civics meets CTE."

Skill Needed

- Civics understanding—as it relates to regulations/advocacy with government officials and agencies

Trend: Financial Accountability and Changes in Processes in Remote Work

The process of applying for grants is now all online, meaning more people and processes are involved now than ever before. Partnering on the front and back end of projects and processes involves a lot of complexity now. There's a need for project and process management skills to organize everything and to stay on track with deadlines.

Skills Needed

- Collaboration and coordination of complex processes as a team
- Project and processes management
- Organization
- Time management—meeting deadlines
- Networking with people

Trend: Increasing Focus on Health Equity and Diversity

It is important to ensure that we're addressing equity, inclusion, and uplifting women and women of color, reducing barriers for women to thrive. CTE work is happening in this area and is igniting these equitable pathways for these diverse populations.

- Collaborating more intentionally with ESL, and FT workers

Trend: Knowledge and Awareness of ACEs

Trauma-informed care recognizes and responds to the signs, symptoms, and risks of trauma in the general population to better support the health needs of patients who have experienced Adverse Childhood Experiences (ACEs) and toxic stress.

Trend: Creating Equitable Pathways To Join the Industry/Talent Pipeline

- Empowering underserved and underrepresented people
- Increase around talent recruitment and retention
- Multi-generational talent recruitment
- Working parents in the workforce
- Accessibility and affordability of Early Childhood Facilities
- Getting children involved in WBL so that they're ready
- Family-friendly work policies
 - E.g., in manufacturing—more flexible schedules for employees to switch off for family-related obligations
 - Not scheduled before 9am or after 3pm for meetings
- Early-childhood education involves multi-generational policies and principles—COVID-19 accelerated these issues and thoughts; childcare and early childhood are important for working parents so they can be more productive and present in their jobs and at home

Trend: Increase in Data and Access to Information

The increase in available data and access to information applies to so many areas and will continue to proliferate. There was not much discussion on this topic other than this one statement. The implications for this increase in data and access to information as they relate to HSET occupations were unclear.

Trend: Demand for Adoption Outpacing Available Birth Mothers

This trend has ethical implications that are cause for supporting and protecting the birth mothers who are choosing adoption. There are variations in regulations from state to state. It is important to manage access to resources for mothers deciding to choose adoption. Placements saw a record year last year due to everything moving to online but other agencies did not respond or deliver resources accordingly and it slowed down many processes. One example is that training and orientation courses are typically conducted in-person and some agencies were not able to pivot and make these services available.

Another example was of expectant mothers needing housing while there is currently a housing shortage. There is a need for allocations of resources and there are issues of being unable to provide those resources.

Social service programs are expanding to support families staying together but finances are cause for considering adoption. Financial support can help families stay together.

Families could expand their networking to other states but there are not enough resources nor good access to those resources.

There are ethical dilemmas with attorneys, birth families, and other stakeholders who are all operating under different ethical standards. For example, some states don't require the education of adoptive parents.

Nebraska's child-placement legislation is not up to date. Regulations play a heavy hand in the process and they are not current. All of these issues make operating in the field challenging. Financial support and advocacy for standardizing regulations would support both sides of the adoption process—birth mothers and adoptive parents.

- Navigating uneven allocation of resources
- Race issues and support for birth mothers
- Navigating differing state regulations
- Navigating outdated regulations
- Advocacy and financial resource distribution

Trend: Teacher Recruitment Is Low

There have been hiring difficulties, especially hard in the rural CTE areas but also in the urban areas.

They want to encourage recruitment from the business community rather than only brand-new teacher candidates or from other school districts.

“Look in your own backyard” for people who are interested in a career pivot or who want to “give back to their community.”

Other states reach out to early retirees of corporations. The corporation will help fund the courses required to teach. Second-career people coming into the district face some biases but that needs to change. Older candidates are less likely to move out of the community and/or job. Many are interested in staying for the next 10-15 years.

Trend: Sustainability Interest

Sustainable practices are lacking in this space. Younger generations are interested in sustainability but there is a lack of education around this topic.

Recommended Resource

- Leading with VUCA volatile, uncertain, complex, and ambiguous (“To meet the moment”)
 - VUCA: <https://www.edweek.org/leadership/video-vuca-what-it-is-and-why-it-matters-to-schools/2021/04>

Emerging Occupations

- Marketing/CRM Database Manager: Engaging individuals with a target market—every business now has that function
- Data Officers: Every business now has these functions
- Google Ad Managers
- Social Media Coordinator (also Influencers—maybe freelance; ensuring online presence)
- DEI Officers
- Transformative Justice/Director of People Power—centralizing power in the community rather than traditional top-down or hierarchical leadership model
- Coaching jobs: personal, accountability, career, executive, leadership, health, nutrition (different areas of people’s lives/life skills)

Trends Panel: Human Sciences—Government and Public Administration; Law, Public Safety, Corrections and Security (May 4, 2021)

Business and Industry Participants

1. Randy Kissinger, Labor Department
2. Sean Minahan, Law Firm

Top Trends and Related Skill Sets

Trend: Changes in Employment and Training/Recruitment and Retention

This discussion related to decreases in population in the rural areas and a fleeing of young people to the cities for work. This is causing changes in employment and training as well as changes in recruitment and retention as they look to stem the flow of young people leaving the rural areas or entice them to return. Because there is a more mobile workforce coming in who can keep transitioning to better opportunities, there is a need to invest experience, time, and effort to retain good talent.

“Grow our own; Keep our own.”

The high level of turnover can have adverse effects on work culture. Virtual work is creating some of these same negative effects on work culture.

Staffing with manufacturing is way behind in hiring. Even with “just in time training,” they cannot find enough workers. There is a recognition that partnering with local school districts is important for direct access to the labor pool.

Recruiting Ideas

- Communicating/Marketing the opportunities available for high demand/high wage roles
- Exploring career occupations within a field
- Student expectations of the work world is somewhat disconnected from reality. Need to give students more exposure to the business world in order to engage them and maintain those connections with them.

Employment and Training

- Moving towards apprenticeships, direct internships, giving students experience, credentialing
- Offering jobs before they take the Bar Examination

Retention Ideas

- Professional development committee with younger employees—group learning in teams
- Social bonding at after-work events to create a sense of loyalty to the company
- More of a team approach to projects—younger people want engagement and to feel they're involved in the whole team process
 - This has been a struggle with people who were happy with how things were
- Capitalizing on the tech skills, education, and ideas of young people
- Two by two communication: Builds rapport and relationships among older and younger professionals to give them the freedom so that they'll stay
 - Mentorship
 - Multi-generational communication

Mental health was discussed briefly in relation to this topic.

Skills Needed

- Ability to develop a supportive group among peers to discuss problems
- Ability to ask for help and direction or to be able to voice needs and concerns to superiors for feedback

Trend: Changes in Management Structure Affecting Communication

Communication is important now because of changes in how management is structured. There is less middle-management which requires a person to have more self-discipline and self-motivation.

The ability to communicate on multiple platforms with multiple partners and multiple teams is also a trend. The skills needed are in relation to how one interacts in that changing environment and is able to work in various teams across the work world.

Skills Needed

- Adaptability
- Self-discipline
- Self-motivation
- Decision-making

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- Multi-language, multi-cultural awareness
- Communication across age groups
- Maintaining skill sets in the older population

Trend: Increased Use of Social Media To Conduct Investigations and Research

There is opportunity for those with social media skills to fulfill the need for these types of investigations.

Skills Needed

- Social media skills related to investigation and research

Trend: Quick Adoption of Online Technology in Remote Work

The discussion around this trend related to changes that were probably already underway but then were accelerated due to the pandemic.

Formal court hearings went virtual, however; judges like having people in their courtrooms. Less office space is being used with people working remotely. Less travel is saving on attorney bills for clients. Because of these benefits, hearings most likely will continue via Zoom.

The benefits of virtual court hearings:

- Flexibility
- Greater access to legal help outside of clients' local areas

The negatives of virtual court hearings:

- No longer need attorneys (law practices) to be physically located in rural areas; this will continue to progress
 - In order to bring these professions to the smaller towns, it's foreseeable that larger or mid-size firms will create satellite offices in rural areas.
- Will see more consolidation of larger firms taking over smaller firms

Trend: Areas of Law That Are Growing Due to Tech Expansion

Cases brought on by social media:

- Libel, slander, defamation, cyberbullying
- Plaintiffs' bar—see an opportunity with individuals who feel they've been wronged by social media and personal injury (direct causation to emotional and physical harm)
 - Cyberbullying causing someone to harm themselves
 - Privacy issues around security breaches
 - Negative review campaign employing bots to destroy a business' reputation

Contract disputes due to contracts now being signed online:

- IP investigations to see when and where a contract was signed
- Verification of those things and who controls this information

Additional Trends and Related Skill Sets

Trend: Big Data Causing Us To Work Differently

Big data is creating efficiencies and saving resources if employees have enough tech savvy to find the databases, use Google and other search engines for internet research, cell phone data, social media research, etc.

Big data is making everything ROI-driven in companies.

Skills Needed

- Entering data into a data system—data management/administration
- Futuristic planning: Data-driven forecasting
- Metrics on the services performed
 - Reporting out on these efforts
- Math applied to real-world opportunities
 - Interpretation of data and communicating it out to persuade people (across multiple platforms)

Trend: Continued Increase in Marketing RevOps

Skills Needed

- Per-quarter reporting on targeted marketing—calculating the results of marketing efforts (RevOps)
- Analysis and reporting on social media and website metrics to see where you're doing well

Trend: Increasing Need To Support Self-Teaching and Self-Learning

Behaviors

These behaviors are happening already in the current workforce/generation and there is a need for making the work environment conducive for employees to have the freedom to learn on their own. This should be encouraged or they'll leave to look for it in other places.

Trend: More Laws and Regulations Around Social Interactions

The discussion around this trend stated that these laws and regulations are on the horizon due to the increasing number of cases and issues that they are seeing in these areas.

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- More cases are being brought on by social media interactions will prompt more laws and regulations for social media use and for social media companies.
 - Libel and slander with Yelp
 - Cyberbullying: Direct personal injury
 - Privacy issues
 - Bots directly harming businesses
 - Contract disputes via IP address—who controls that information?
- Social and civil rights
- LGBTQ+ rights

Trend: Increase in Environmental Laws

Due to more consumer acceptance and change, there is a bigger push for sustainability. This will create an increase in environmental laws and regulations. One example is that companies going paperless could roll over as a regulatory change.

Because of these changes on the horizon, certain businesses won't be around due to sustainability changes.

Trend: Increase in Ethical Business Practices and Policies

Discussion included questions around how businesses ought to respond to ethical issues. The example given was that most companies now have or are developing and adopting social media policies for their employee handbooks. This is in response to unethical social media posts by employees that do not represent the company.

Trend: High Demand for Paralegals

There was not much discussion about this; just a mention that paralegals are now high demand/high wage because there are not enough people with these skills.

Trends Panel: Agriculture, Food, and Natural Resources (April 29, 2021)

Business and Industry Participants

1. Jon Brabec, Frontier Cooperative
2. Kevin Sagehorn, Aurora Cooperative
3. Pernell Toney, Farm Credit Services
4. Stephan Becerra, Corteva Agriscience
5. Steve Wellman, Director of Department of Agriculture and Syracuse Farmer

Top Trends and Related Skill Sets

Macro Trend: Changing Demographics of Farmers and Consumers in Nebraska

The participants described a large demographic shift happening in customers and farmers nearing retirement age. Commodity prices may accelerate this transition. This is causing farms to change hands and seeing fewer farms overall. In some cases, larger farms take over smaller farms. Needs are shifting to larger farming operations and expectations around production and more needs (financial and otherwise) around further consolidation. It is capital-intensive to be involved in farming now, and this is making it hard for the smaller farms to continue or not financially viable for beginner farmers to start up.

The other issues contributing to the changing demographics relate to the aging of customers (local residents) and the movement of the younger generation out of rural areas to the bigger cities in Nebraska or out of state. The participants feel it is detrimental to agriculture to continue developing the urban areas (a small overall percentage of the state) to the neglect of the rural areas. It is difficult to save every small (150+ population) community, but hub solution seems to be working. A hub strategy helps bring people back to the rural areas with housing, employment, and other amenities. There is some partnering happening with chambers of commerce and help in fundraising drives around certain needs such as bringing in broadband internet to the rural areas.

Workforce development initiatives are focused on attracting employees to the rural communities. They are investing in development that offers the lifestyles and opportunities found in urban areas, i.e., getting people to see the value of rural life while providing them with some amenities of the city.

There is an overall lack of trade workers (hands-on skilled trade roles).

Labor constraints are leading to finding efficiencies to manage farming. Technology is assisting and will continue to assist with labor constraints. Tech/Autonomous will be even more important in treating site specific rather than broadcast. This trend will be environmentally friendly as well.

There is bias around what agriculture is and most people don't realize it involves technology and science, therefore it's hard to recruit for those roles. There is a need to educate the younger generation that technology is being used/is a high need in agriculture.

Trend: Accelerated Need for Financial Acumen in Agriculture

Because of the high startup costs and other costs associated with agriculture, and the entrepreneurial nature of farming, strong financial skills are a must.

Skills Needed

- Personal finance
- Strong business plan; marketing and business acumen
- Risk-management skills
- Entrepreneurship skills

Trend: Technology's Role in Agriculture Is Everywhere Now

There is a great need for technology-oriented and tech savvy employees in agriculture. Students need to be able to adopt technology and be able to adapt quickly to changes.

The perception is that tech isn't a part of day-to-day agriculture. Students (potential employees) don't realize or see agriculture as being high-tech. This needs to change to attract workers for these roles.

Producers are starting to prefer digital communication to in-person. Employees need to be adaptable to this preference.

The following are ways in which technology is being used in agriculture today:

- Finding solutions before the problems surface. Precision farming is utilizing technology to identify potential problems and fix them to prevent downtime (preventive maintenance).
- Paper is outdated, no longer relevant; communication needs to be timely/immediate
- Agriculture uses technology to track the product from beginning to end
- Drones: Security of the animals in a feed lot; software to see movement patterns of the animals; find issues in the field early to correct them; sprayer technology;

applicators being more prescriptive and precise; helping producers raise better crops

- Both large and small farms are using drone technology.
- Robotics and autonomy are helping with labor constraints
- Tech is addressing sustainability and environmental issues with targeted/site-specific treatments rather than broadcast treatments
- Radio (high and low) frequency with tags on individual animals—regulates diet on a more specific level; monitors health/wellness of animals on an individual basis; tracks movement, body temperature, etc. This technology will continue to improve and increase in broader applications.

Skills Needed

- Data analytics and modeling
- Continuous learning/Adaptability/Flexibility to respond to pace of change
- Computer science with a base in agriculture/agriculture
- Software: Developing and writing code
 - Smaller startups currently coming from outside Nebraska mean there is opportunity for local creation. “Where’s your passion/How can you contribute?”
- Identification and problem-solving
- Critical thinking

Trend: Continued Application of Science Skills in Agriculture

Need Like technology, agriculture needs workers who are steeped in STEM abilities. The participants mentioned that the world of AFNR will struggle with finding enough people to fill these roles because this career field area isn’t necessarily the focus of STEM students. There is a need for attracting students with a background in STEM. There is a need to find people who can make the connections from science to production.

Skills Needed

- Genetics, biologicals, CRISPR technology (plant and livestock)
- Anatomy, veterinary medicine, zoology
- Chemistry (to analyze/study soil, water, nutrients, fertilizer)
- Math
- Identification and problem-solving
- Critical thinking

Trend: Increase in Marketing: Local Workforce Development and Global Relationship Development

Technical jobs are becoming harder to fill and harder to retain.

There is a need to create opportunities for people to see the benefits of living in a rural community. Amenities need to be created to supplement the work-life balance benefits.

There is also a need to create a diverse workforce (in terms of skills; not ethnicity necessarily). The workforce is depleted of hands-on skilled trade workers, and the adoption of technology is paramount as well, ensuring that they understand the amount of technology involved and have skills to adapt to this tech-enabled field.

There is a current challenge of exposure; there are too few agriculture programs in Nebraska. There is a need to continue to expand the exposure of students in urban areas to the diverse array of agriculture occupations.

The other skills that are needed are around global relationship building. Nebraska agriculture is marketed and exported to 90 countries worldwide. The political environment plays a part in the trends in agriculture (international, national, and local) and the relationships around the world. Sometimes there is a need to be face-to-face to build the relationships and trust. Southeast Asia requires this face-to-face communication. Some of the export countries include Japan, China, and South Korea, in addition to Mexico and Canada. Retaining these top export partners means our products must be trusted with food from the U.S.

Relationship building is hard to learn so the right personality/approach is needed to connect with potential customers. Business ethics is key.

Agriculture in the U.S. is very productive; 96% of the population resides outside of the United States and Nebraska helps to feed much of it. There must be trust around high-quality products and safety standards in order for these relationships to continue.

Skills Needed

- Sales, relationship-building, and communication skills (multi-language/multi-cultural)
- Good business ethics (quality and safety)
- Agriculture promotion and development
- Promotion in the U.S.
 - Promotion internationally
 - Local recruiting of farmers to the area
 - Recruitment
- Risk analytics, data scientists

Trend: Increased Awareness and Action on Environmental/Sustainability Issues

There is an awareness of food waste and a greater social awareness around environmental and sustainability issues. Company values and communication of those values matter. Students are more aware of where companies stand on these values and this is important to them as well in terms of where they want to work.

Skills Needed

- Water management, conservation, agronomy, production
- Chemistry—nutrients and contaminants
- Water filtration
- Flood control
- Water usage: Efficiency and regulations; impact upon the urban sectors (irrigation)
- Fertilizer application and impact on farming
 - Nitrogen-use efficiency
- Managing natural resources generally: Human use and consumption; recreation; balancing demand among different stakeholders
- Analysis and decision-making: In terms of business continuity
- Identification and problem-solving
- Critical thinking

Additional Trends and Related Skill Sets

Trend: Continued Rise in Consumer Interest in Their Food

Consumer interest in their food has expanded. Consumers are sometimes receiving misinformation (e.g., livestock production methods, organic vs. non-organic) or not hearing the whole story, and this can increase the cost of food. There is a need for this information to be fact-based for balanced decision-making for consumers. Some perceptions tend to drive certain markets so we need to look at that. The example given was organic products.

“Let’s buy it because we want to but not because it’s safer and more nutritious—there’s a cycle there as well.”

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“Knowledge is good but sometimes information is based on perceptions rather than facts.”

The trend of plant-based foods is increasing and will drive demand for other pulse crops. We must understand the environmental impact; water is becoming scarcer and we must consider watersheds and impacts on water.

There was some discussion around climate change and greenhouse gas emissions and what role livestock plays. The question was about the need to research what happens if we remove those animals from the system. This removal will impact something else so we need to look at the whole story.

There is generally more focus on how agriculture affects the environment. The management of fertilizers and maintaining of healthy watersheds and safe drinking water is a priority (waste management efficiency and fertilizer efficiency). There is an opportunity to tap into ongoing research at universities.

Trend: Increase in Food Safety/Regulatory Issues

Buying local/Buy from the farmer = less regulation on those products (yet many consumers prefer this). Large-scale production gets criticized but is incredibly efficient for getting food to consumers.

Trend: Continued Need for Communication, Connection, and Trust-Building With Consumers

The participant observed that they do a great job making plans with producers for this year but beyond that they lack in the area of communicating and connecting with the consumer. There's a need to add that connection to develop trust between the producers and the retail business.

“We need to communicate how good our producers are at feeding the world.”

Traditionally, agriculture was more face-to-face communication, but these norms are changing. Many are opting for text as opposed to on-farm meetings. Zoom is becoming rapidly accepted to overcome distances. Driving 2-3 hours for a 2-hour face-to-face meeting may not be necessary, saving face-to-face meetings for matters of key importance.

Communication must be more up to date and timelier than a hard copy magazine can provide. There is a move to more digital communication methods.

The move toward digital commerce, to research products and then to access and purchase, online is growing. Technology is speeding up the process in building relationships with both positive and negative results. The pandemic created broader range of connectivity options. There was discussion about resources to maximize communication.

Some Resources Given

- Cloverleaf: Integrating several different personality assessments into one application to understand someone's strengths and to maximize communication
- Social media: Pairing up with like-minded people
 - Positive: Speeds up relationship building
 - Negative: Leaves out people who are not like-minded/missed market opportunities
- Move to more digital commerce (online, digital, timelier)
 - People want to research, access, and purchase products online

Skills Needed

- Interpersonal relationships and relationship building
- Diversifying connections across different communication channels
- Digital communications and newsletter creation
- Employee mindset, psychology, and mental health—do people enjoy being a part of the bigger picture?

Trend: Continued Need for Ethics in Agriculture

Students need to be taught to do the right thing for the workers, for the animals, etc. This general awareness also needs to be communicated—that we are doing the right thing in agriculture.

We can trust our producers because they are so good with the animals. Land-management is becoming so efficient. There is a need to develop business values statements (“We Are Statements”) to let people know where we stand.

Trends Panel: Health Sciences (May 5, 2021)

Business and Industry Participants

1. Karen Weidner, NECC Technology and Tele-Health
2. Kari Fluckey, HR GI Med Center
3. Stacey Dam, Bryan Health Care Early HS Programs
4. Heidi Kaschke, UNMC HS Alliance Program
5. Jason Thomsen, LPS/CTE Coordinator
6. Rachel Buss, Pediatric Nurse
7. Stephanie Leonard, Interim Marketing Director, CHI Health

Top Trends and Related Skill Sets

Trend: Technology Solutions for Collaboration and Teamwork

Participants reported that they are seeing technology that is supporting more telehealth and more training scenarios. This is creating opportunities in tech and healthcare for collaboration with interdisciplinary fields and teamwork.

Skills Needed

- Telehealth has skyrocketed during the pandemic.
- Using simulation events for training: A need for gaming and scenario-creation online; need people with programming skills with a background in medicine or biology
- Residents using tech for practice scenarios; surgeons using mannequins to practice surgery skills
 - Tech is being used for training students in other/various healthcare delivery scenarios
- Using tech for remote learning
- Health information management—big databases: Need people who can use these systems effectively; dig into data and focus on coordinating care

Trend: Tech as Driver of Innovation and Other Trends Brought On By the Pandemic

Tech has been a big driver of innovation in healthcare and we saw that amplified during the pandemic.

It was noted that telehealth will stay in the rural areas to provide contact with specialists or for higher level care that cannot be met in these areas. Mental health professionals, for example, will continue using telehealth to provide care due to shortage of providers in the rural areas.

Along the lines of other trends brought on by the pandemic, an increased number of students became CNAs this past year as the time frame for certification was shortened to address this need. Some colleges are requiring an active CNA license as prerequisite to further medical studies.

“CNA is a gateway course for additional courses and health-care careers.”

Some colleges are requiring the active CNA license as a prerequisite to nursing studies.

Trend: As Technology Continues To Evolve It Creates Sophistication on the Clinical Side

The increase of tech comes with new concerns with regard to clinicians maintaining password security and more fully understanding privacy and security concerns (cloud versus server, etc.).

There is a need for clinicians to be able to recognize breaches in the system, phishing tactics, etc. Information technology compliance and understanding one’s role in keeping things secure is now part of the career training and responsibilities. There is random testing performed on team members and staff to detect problems and to train for these safety issues.

Accountability around access (in addition to understanding HIPAA) is now necessary because healthcare professionals have access to so much private information.

Additionally, when systems are down, there is a need for responding in order to secure the continuity of business and to maintain patient care.

Skills Needed

- Password security
- Understanding privacy and security concerns (cloud vs. server, etc.)
- Recognition of breaches in system
- Understanding information tech compliance
- Understanding one’s role—accountability around access (in addition to understanding HIPAA)

- Phishing testing
- Response when systems are down/continuity of business and keeping patient care going

Trend: Recognized Need for Innovation, Creativity, and Collaboration

Critical thinking in healthcare solutions is needed to find efficiencies to help patients and to keep costs down, especially in hospital management.

CMS (Centers for Medicare and Medicaid Services) regulations bring some additional need for creativity because rules keep changing.

Healthcare is inter-professional—there are many people who are working together to help the patient in any given situation. Collaboration is necessary, rather than autonomous action.

Skills Needed

- Critical thinking
- Creativity
- Collaboration

Trend: Need for Resiliency Amid Fallout from Pandemic

This past year, the pandemic put a spotlight on the stress and anxiety affecting healthcare providers and everyone in the healthcare professions. There is and will continue to be a need for teaching coping mechanisms and self-care for this industry.

Resources are now available, but knowing where to go and admitting that they need it (availing themselves of the resources) is challenging because it can be viewed as a stigma to accept help for people in helping careers. This messaging needs to change for people to feel encouraged to take care of themselves and to adopt resiliency methods so that they don't run into burnout.

Skills Needed

- Teaching resiliency and coping methods
- Highlighting importance of self-care
- Messaging to encourage people to take advantage of available resources

Trend: Ongoing Need for High-Level Customer Service

All levels of customer service that flow throughout the patient's experience (in a hospital, for example) are important and emphasized to assure best outcomes for patients and providers.

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Communication was identified as being the number one skill needed in this trend. Specifically, verbal communication—speaking in direct, face-to-face conversations are important to patient care. Face-to-face conversations seems to be a struggle for younger generations but it is a necessity in healthcare.

One example of a critically important conversation is providing patient or caregiver education in medically complex situations.

Another example was training future workers on how to have difficult conversations with patients/family members/caregivers. There is a need for empathy and communication in delivering difficult news or information about a person's health. Medical humanities programs are popping up to serve the need for this type of training.

Skills Needed

- Ability to overcome obstacles/challenges
- Dealing with ambiguity
 - What is the best process for the hospital/patient success? Finding a good solution in situations that are unclear or ambiguous.
- Resourcefulness/Adaptability—developing new processes with regard to internal and external resources
- Accountability/Dependability
- Commitment to the organization
- Core values and upholding the values of the institution—understanding the focus of the healthcare setting.
- Teamwork: Communication and coordination of different types of professionals and listening to other experts to improve patient care.
- Quality improvement/Quality assurance: Triple Aim
- Improving individual experience of care (patient satisfaction)
 - Improving the health of populations
 - Reducing the per capita costs of care for populations

Tech Tools Affecting Communication

- Telehealth leans into new ways to communicate
- SBAR, Pass the Baton, etc.

Additional Trends and Related Skill Sets for Health Sciences

Trend: Rise of Diversity, Equity, Inclusion, and Access (DEIA)

There is an increased need for cultural sensitivity and culturally appropriate healthcare (patient-centered care) delivery. Practitioners are needed to provide care that caters to multi-language and that recognizes and provides for a patient's cultural practices, norms, and beliefs.

When asked how organizations are currently providing some of these solutions, one answer was with "cultural time-outs."

Cultural time-outs are taking time out of regular procedures to address religious or cultural specificities to come together with resources that would be beneficial to the patient. It is time dedicated solely to considering the patient's needs. A case manager would coordinate these resources with the patient.

There are also needs with regard to gender identification differences and language e.g., using preferred names and pronouns, among other things.

Roles needed for these two areas include:

- Care coordinators (usually an RN background but also can be social workers) to coordinate care among the various providers needed
- Care navigators; patient advocates: To assist the patient with navigation of experiences through the different aspects of care

Skills Needed

- Patient-centered care
- DEIA awareness and sensitivity – understanding needs

"Patient-centered care is critical to rehabbing well."

Trend: Scope of Practice in Governance: Roles, Regulations, and Impact on Careers

Individual occupations have changed in terms of their scope of practice. Trends with regard to nursing (CNA, RN, Practitioners) were discussed, as well as other roles and the scope change impact.

Examples:

- Pharmacists are allowed to give injections now (to assist with COVID-19 vaccinations)
- Skills taught in CNA are not permitted in every hospital. People have to practice within their scope.
- Paramedics are different than EMTs (critical care)
 - EMTs are primarily interacting with a hospital ER.
 - Paramedics can complement the home community healthcare arena to help manage long-term healthcare needs such as diabetes, etc., in patients' homes.

Rural vs. urban settings are important to address different needs.

“Be prepared for transitions to different types of hospitals, different healthcare institutions, and even different departments within a hospital.”

Trend: Resource Networking—Rural and Urban Partnerships

Resource networking is the sharing of health systems records, resources, and buying and purchasing power between medical clinics, labs, and hospitals. Resource networks are important to the big health systems and are often happening between rural and urban partnerships.

Information and resource sharing also helps to ensure that the patient has a more seamless experience with filling out information, providing their medical story once rather than repeating it in multiple circumstances or locations.

Trend: Behavior-Based Interviewing Based on a Heightened Need for Awareness of Ethical Issues in Health Care

Ethics and integrity-based questions are embedded into the behavior-based interviewing and training process for healthcare programs. They have been included in those programs and continue to be an important part of the process due to the ethics involved in medicine and healthcare.

Trends Panel: Skilled Technical Sciences—Architecture and Construction; Energy and Engineering; Manufacturing (May 6, 2021)

Business and Industry Participants

1. David Madcharo, SECC, Energy Program Director
2. Ann Boeson, MUD, Employment
3. Jim Wolfe, SkillsUSA Coordinator
4. Cale Stolle, Assistant Professor
5. Jeff Dolezal, Tack Architecture, Principal/Owner

Top Trends and Related Skill Sets

Trend: Increase in Automation—Robotics, Drones, and AI

Facilities are shrinking their overall workforce, somewhat due to automation but also in response to a decline in available workers to do this technical work. Automation will be big in the industry and in training going forward. Some hybrid (cross-professional) roles will develop as another way to adapt to smaller workforces.

- Automation replacing some workforce
- Automation used for training
- Eliminating more dangerous jobs with robotics
- Hybrid engineer and technician role e.g., an engineer with welding capabilities

Robotics

It is important to give students exposure to robots and robotics. There are different types of robots available but robotics was defined basically as any mechanized system that is intelligently programmed. Therefore, experience with basic programming is part of the process. UI for robots is easier than ever today which means that students can start to do simple processes with robots with little or no prior knowledge or skills.

Increase in Drones and ROVs (Remotely Operated Vehicles)

There is an increase in types and uses for drones/ROVs. Drones and ROVs are basically mobile robotics. They are being used in Nebraska to help with cattle and crops. The coast guard is using them underwater to detect drug running. Alaska has a growing underwater ROVs trend due to needing to operate in dangerous environments.

Drones are being used in the sky (including space with the drone helicopter recently on Mars), on the ground, and underwater.

Artificial Intelligence

Machine learning/Artificial intelligence (AI) is improving—this is where technology is trending right now. Machine learning involves robots that can respond to or predict human movements.

Due to safety concerns with larger robots, there is a trend toward creating a type of robot called cobots. Cobots are collaborative robots that have the ability to interact with people on a safer level. Robots are still injuring (even fatally sometimes) people today. The development of cobots has somewhat taken a step back in robotics in terms of speed and force to reduce the danger to humans. They are intended to be used on assembly lines near or working alongside people. They are much simpler in terms of initial programming but tend to be more expensive due to more moving components, and thus, the potential for failure.

Skills Needed

- Any exposure or experience with robots/robotics
- Mechanization
- Programming

Trend: Advancements in Technology Changing How Work Is Performed

Technology is changing the way we hire and train workers. The “what” isn’t changing so much as the “how.” The participants cited that the same work is being done but how it’s happening is different due to advancements in technology and, therefore, different technical skills are needed now. Many employees are laborers (at OPPD), and they need to develop a level of competence with iPads and computers. Technology is being used much more with utilities. Therefore, there is also a need for data analysis.

The training of individuals has also been changed by technology advancements. Virtual reality has made it possible to train without the danger.

Skills Needed

- Comfort/Familiarity with using computers and iPads
- Specific systems experience (data programs) instead of just manual processes; working with computers versus doing things manually as they were trained to do
- Data analysis
- Some office workers (in utilities) are now remote; plans are to continue to use a hybrid workforce.

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3D modeling was one example given and was described as a form of communication itself. It is quick enough to develop ideas, model something in hours, and share with a team for review. It also allows for looking at dimensions within a site by using GIS to virtually situate in prospective locations.

3D modeling is a large market for young engineers and technicians with 2D, 3D, and CAD skills to produce solid works. It is being used as follows:

- Virtual reality and computer animation
- Renderings: To document ideas; modeling, and sharing within hours
- Integrating with Google Maps to look at modeling within the site
- Huge market for young engineers and technicians who know the following programs:
 - CAD
 - RevIt (more expensive)
 - Rhino (cheaper, older software; better renderings with Enscape)—still being used for basic renderings; then move to RevIt for final product

More information on the above software was shared as follows:

- Rhino is being used because it is more intuitive and not as difficult to use as Revit; industry Rhino is basic.
- Revit is used for construction documentation side of things.
- Rhino is also more affordable (\$800-900) than Revit (\$7,000 for industry).
- Enscape is being used as a modeling engine for virtual reality software.

“Rhino file to STL into a CNC machine for cutting is simple.”

Core competencies are still needed in design, creativity, and 2D hand drawing because software changes over time but 2D skills remain. Without the 2D skills, it can be “garbage in, garbage out” when using the 3D software without initial drawings or ideas that are solid or well executed.

Back to basics of hand drafting, creative problem-solving in addition to understanding computer software—the rigor of these skills has been lost a bit.

“There needs to a back to basics of hand drafting and creative problem-solving.”

*“If you don’t teach creativity with their hands first,
they will not be creative with the software.”*

Skills Needed

- Creativity with hands first (hand-drawing skills) is a must!
- Design competencies
- Creative problem-solving

Trend: 3D Printing Becoming More Affordable

Transferring a 3D model into a 3D printer and CNC makes it easier to bridge the gap between a virtual design and a physical design. This gives more power to the designer. 3D printing is much cheaper today than it has been, and this is making it possible to have these printers in schools and workplaces. As the costs go down, we are seeing more integration of using it in the design process. Small CNC machines are \$5,000.

Trend: Communication and Project-Based Work Is Important for This Field

Communication is the cornerstone of architecture and design—visualizing ideas and selling those ideas to clients, contractors, and bankers is paramount.

Skills Needed

- Communicating with the various stakeholders is so important
- Visual design and communication skills—helping people understand abstract ideas

There is a substantial push to include PBL for development teamwork capabilities—communication at various levels is extraordinarily important, and substantially more valuable right now. Workers still need individual responsibility and to showcase skills before advancing into working in a team environment. But once there, the communication skills are important.

Teamwork capabilities are critical to this field. PBL gives students this industry-like experience. Companies are seeing students coming in without these teamwork skills. Students must know how to communicate with superiors and peers and understand the differences there.

“Over-the-wall” manufacturing i.e., passing a design to creation without going back and forth to communicate (just passing the problem on) is not a good working methodology.

Technicians communicating with engineers and engineers understanding what technicians do—having some base level of skills so that they are on the same page in terms of what is possible/what they’re asking the technicians to do. Engineers are better when they understand real skills. Some companies have been addressing this issue by having engineers out on the shop floor working on technician tasks to help with this understanding.

Other Important Skills

- How to cut wall sections
- Line type
- Line thicknesses
- Industrial design and visual literacy
- Architectural design documents—how they are documented legally
- Critical thinking
- Real-world problem-solving

Trend: Continued and Increased Safety

Safety is always a concern in this industry because high-energy process systems are coupled with human operation and maintenance. There is a need for employers to come in with a safety mindset.

Automation escalates safety issues sometimes but automation can also alleviate safety concerns around things like fabrication.

The ability to operate independently and in a team is important for coordination of safe operations. The process for managing is getting bigger and bigger.

Software allows them to see where clashes might occur between systems; technology has advanced the ability to alleviate some of the danger that can happen in the field traditionally.

Other discussion points on safety:

- Different standards of safety
 - Seeing an increased requirement to be at the highest standard even if the lower levels are accepted—falls on the field workers to have safety standard experience
 - Seeing an increase in safety occupations
 - Safety specialist

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- Safety regulator
- Safety as business continuity team—creates different work tasks when a higher level of safety is wanted to be employed
- Distributed control and sensors are giving organizations a history of events—will see a lot more analysis of these safety events as more data is available for people to analyze
 - Skill: Data analytics
- Internet of Things—integration of seeing a certain bandwidth for wireless transfer of information
 - Water, energy, HVAC monitoring
 - Proactive addressing of potential safety concerns
 - Safety and maintenance teams being replaced by data analytics teams
- How they train is/will be changing with the advent of using AR and VR to train for a job, and this removes the danger.
 - E.g., virtual welding, virtual surgeries
- Cyber security
 - More data and accessibility will create more vulnerabilities.
 - Need security and control around access to these control systems—in some cases, systems are being removed from the internet for safety/prevention from hackers
 - Skill: Cyber security understanding needs to be deepened

Additional Trends and Related Skill Sets

Trend: Remote Work Now and Looking Forward

The remote workforce has some benefits; however, interns need more direct experience. Without the in-person experience, there is some stagnation with the growth of young talent so there's been some pushback with regard to remote work in this regard. There is a recognized need for workers to be present for communication around workflow, culture, and to experience the overall spontaneity that occurs with in-person work in this field.

However, there were some identified advantages and benefits of being remote this year and some changes will most likely continue.

Pandemic Changes That Will Continue

- Childcare arrangements have been easier with increased flexibility around remote work.

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- Software now allows for hybrid remote work to continue e.g., sending renderings to clients via email; communicating with remote tools is definitely happening in architecture and design work.
 - Blue Beam and Enscape were both cited as software that is used for communicating ideas virtually.
- Will be keeping a portion of office and clerical workers remote
- New recruiting is now including hybrid options for remote/in-person
- Critical infrastructure roles will remain on-site
 - Water treatment
 - Power generation
 - Moving these systems off-line to protect them from hacking and to limit remote access

Trend: Environmental and Sustainability Practices Becoming Regular Practice

LEED was big in the 2000s. The requirement to get LEED certified tapered but the principles that it included have become common practice:

- Working with low-emitting materials (low VOCs—volatile organic compounds)
- Relying more on clean energy sources: Solar, wind, geothermal, hydroelectric
- Working with sun exposure/building orientation
- Eliminating waste/using built-in efficiency
 - CNC fabrication eliminates waste due to getting more out of materials.
- Operating systems running on schedules
- Processes are now in general practice—sustainable, low-energy, low-waste buildings are now a trend.

Trend: Unique Ethical Issues or Dilemmas Happening in These Fields

Copyright infringement is an issue with companies taking designs created by one firm to be executed by other contractors. People want quicker business and will cut corners to get there. In response, design fees are being moved into the overall project cost of the job to hold clients accountable.

- How to instill value in the creative process—to be compensated appropriately
 - This issue is growing due to the client expectation of rapid development.
 - Being smarter about demanding fees upfront for designs

Other ethical issues that were cited were those taking place in larger processes.

- Camera and video recordings posted on social media (by workers or customers)—safety and environmental practices being made accessible to the public
 - E.g., Meat and poultry industry practices

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- Recording incidences of workers—seeing things in real-time as issues develop
 - Having a formal record of every event that takes place now (camera and data recordings)
 - Affects both the employer and the worker
- Skill implication: Personal responsibility and professionalism are becoming so important

Regulatory

This was not necessarily a trend but just a reminder that codes shift every couple of years and there's a need to keep track of them. Also, practicing in different states and learning/awareness of those different codes is important.

DEI

This also was not necessarily listed as a trend so much as an acknowledgment that companies are looking to diversify and not finding enough qualified candidates who've attended college.

- Minority students not making it to college/opportunity at the high school counseling level that needs to be addressed to reach these students and better prepare them for college and beyond

Trends Panel: Skilled Technical Sciences—Transportation, Distribution, and Logistics (May 6, 2021)

Business and Industry Participants

1. Patrick Needham, Pilot, Silverhawk Aviation
2. Emily Workman, HR, B Street Collision

Top Trends and Related Skill Sets

Trend: Costs To Be Trained in Aviation—Can Be a Barrier to Entry

- JTEG program gave them their ground school and would pay for a year of college.
- ROTC also a good resource: Learn to Fly.
- UAV Training
 - Using different types of solar panels to scan for dead spots—started a business doing this
- United Airlines just bought their first flight program this year.
 - Focus on women and minorities
 - Also need mechanics
 - Air-frame and power plant mechanics are a big niche for airplane maintenance

Skills Needed

“Pilots are semi-professional weather men.”

- Being able to tell and understand:
 - Temperatures
 - High-pressure, low-pressure systems
 - Surfaces
 - Headwind/Fuel burn/Ground speed—a lot of math use
 - Take-off speed
 - Length of runway
- Interpreting charts; mental math
- 3P model: Proceed, process, and perform
- 3 to 1 rule for every thousand feet need 3 miles

“Anyone can learn to fly a plane, but we teach them for that one-time emergency that they can encounter. [You] can use ground simulators to teach students to make quick decisions in emergency conditions.”

Trend: Technology Has Changed in Aviation

- Technology has changed in the aircraft.
 - Redundancy systems now to back up digital systems
- Voice patterns and voice recognition
- ATC has changed a lot.
- Used to teach phonetic alphabet but don't do that anymore
- Tend to fly more with instrumentation and automation now
- Shorter routes with GPS
- Safety has increased with automation.
- Amazon
 - Buying their own airplanes
 - Experimenting with drones

Skills Needed

- Need to understand systems.
 - Have weather transmission but it's on a 6-minute delay
- Muscle memory and repetition are really important in flying.
- Aeronautical decision-making
- Reasoning/Correlation application—putting things together and getting a big picture
- Situational awareness is important and sometimes hard to learn.
- Physics
- Have to always exceed Federal Aviation Administration (FAA) regulatory requirements

Trend: Evolution of Vehicles

- Continuing education as vehicles continue to change
- Certifications and staying relevant

Trend: Equipment Changes

- Repair and customer service
 - Getting vehicles back to customers quickly
- Updating to new materials—aluminum, etc.
- Educating technicians on the materials we're using
- Electric cars
 - Being more hands-off e.g., working with a wireless Tesla technician
- Updating their physical locations (building layouts) in response to these changes

Skills Needed

- Tooling—comfortable with tools and mechanics
- Vehicle knowledge
- Mechanical knowledge
- Working consistently at a consistent pace
- Coming in with hands-on knowledge

Additional Discussion Point

Business Sustainability

- Business is booming (chartered flights).
- Flying charter is more affordable than they thought.
 - \$3500 across eight seats
 - Shorter time requirements
 - No TSA

Regulations

- Federal Aviation Administration (FAA) regulatory requirements
 - FAA spells out what everyone needs to learn
 - 40 hours total but usually requires more
 - 2 hours of night time 2 hours of instrument
 - TSA

Work-Based Learning Discussion Across Career Fields

Overview of Work-Based Learning Discussion

We asked participants if their business or company is currently participating in work-based learning (WBL), and if so, what are the general experiences that are happening.

We then asked what would increase their business' participation and/or what are the barriers to participation in WBL.

Finally, we asked panelists what needs to be in place for WBL experiences to be successful and what qualities are important for students to possess in order to get the most out of the WBL experience.

What are your experiences with WBL? Is your company or business participating? What do you generally know or understand about WBL? If you have had positive experiences, what elements were in place to make it a quality work-based learning experience for students and your business?

Most participants across all sectors had a general understanding and appreciation for work-based learning and all of its different iterations, including career exploration, field trips, job shadowing, informational interviews, internships, co-ops or apprenticeships, and externships.

Sometimes, an industry would identify which types of WBL were more conducive to their business or industry and why. Often, it had to do with the amount of time needed or amount of time available (on both sides) and the amount of time invested in relation to ROI.

Generally speaking, longer periods of WBL experiences seemed to be preferred in order to ground students in the culture, give them genuine experience in the real-world workings of the business, and to create relationships that might lead to future employment opportunities with that employer. These types of experiences include internships, apprenticeships, and co-ops. They also explained that these types of WBL are time-intensive for businesses and the ability to manage it is not always feasible.

Career exploration and exposure were also cited often as being an important part of the overall objective of getting students familiar with occupations that they may not know exist within a field or that certain occupations exist in industries that students may not have considered. These career exploration experiences include business and industry panels (on-site at school or virtual), field trips to businesses to meet career leaders, mock interviews with industry professionals, informational interviews, and job shadowing.

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Job shadowing was one type of WBL that several panels commented on as needing more curriculum support or preparation for the student prior to arrival and more guidance for the businessperson to know what to do in a job shadow situation. It was the one option that yielded the most mixed feedback in terms of comfort with the process for businesspeople.

Since the following two questions were shorter and more informal with shout-outs and comments in the chat room, we chose to capture the feedback as bullets under each section heading rather than as full-blown discussion points. When warranted, we added additional information, or made clear if/when a comment was industry-specific.

What would increase participation in WBL or what are the barriers to participation?

- Financial privacy is a barrier (banking).
- Entry-level isn't what it used to be—it's more complex, and this is incompatible with the length of most internships (banking, but other industries concurred).
- There are amazing opportunities for students to start their professional careers first as an intern (4–5-year training program for a new employee). There needs to be a balancing of expectations due to the length of time allowed for internships (law).
- Increased participation: Comparative education in other cultures is built into the system; need both sides of the economy to make it work/systemic change to fix this emphasis on 4-year college and to get students into certification and internship programs that focus on good careers with or without a 4-year college degree.
- Big time commitment from the employer to do it right and do it well—presents a big challenge for the employer especially as business has to become more nimble with advanced technology, etc. (Pace of change has affected availability of staff to work on this.)
- Legal age requirements for licenses (18 to deliver medicines or to be a pharm tech)
- Transportation
- Access to health care related training: Camps, job shadowing on the weekends
- Volume of requests are sometimes overwhelming (health)
- Making sure students have different and continuous experiences so they can see many different types of careers within the field
- Prioritization of interns and nursing students—a lot of competition for the space to get high schoolers into the hospitals
 - Coordination with HOSA
 - Hospitals trying to mitigate their risks
 - Career information around other options besides nurses and doctors—routinely encourage them about these other options

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- Trying to expose students to the new equipment in health care
- Job shadowing:
 - Students need more grounding information coming in.
 - Employer didn't understand what to do with students in this scenario.
 - Six hours is not enough time to really learn anything.
 - Introductions prior to the job shadow—career exploration first
- Marketing and communication of needs: The ability to reach students and parents to communicate opportunities that are available and how impactful those opportunities are for students. Also, to communicate the need for future workforce development, particularly in the rural areas where students might be fleeing for bigger cities.
- The desire to communicate the needs and the opportunities to have a good work-life balance while staying in the rural areas was mentioned in multiple sessions.
- Time commitments, especially in high school; competing with all the extracurricular activities
 - Two-hour blocks are great but it's a big ask for schools.
- Age restrictions can be a barrier.
- WBL schedules being out of alignment with the school schedule (class times) and “real-world work” schedules (HSET)
- Job shadowing doesn't give the full picture of the job. (HSET)
- Need a structured WBL curriculum.
- Supervision is important.
- Have the students get really involved, not just doing research or updates.
- Companies need to get to know the students in order to retain them.
- Job shadowing for high schoolers? Not really, but maybe in smaller firms (law practice).
- Tours and open house are now real-world driven.
- School or dual-credit opportunities
- Summer work: Three years in a row sets them up for a future employment at that organization (law).
 - Summer clerk program hiring straight from law school
 - Offer jobs before they take the Bar Examination

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- National companies need to be reassured that it's safe to bring those younger ages into the potentially hazardous occupations.
 - E.g., Aeronautics exposure and partnerships—how do we do that at the national level to ease the litigation fears for large organizations?
- Media mentorships: Have been limited to teaching some of the basics; it's high-touch so scale is limited, but excited to continue to build it (media literacy/recording/student reporting labs). (NETC)
- Marketing/Communication: Connecting the pipeline of students to the opportunities/companies that need them is critical and isn't happening currently. (IT)
- Relationships with smaller school districts but smaller companies don't have the bandwidth to do this
- Panels of professionals for students around career exploration and "Q&A" (Gallup organizes)—great opportunity for students to meet professionals in different areas of tech: developers, project managers, product managers, IT managers

"At Gallup, we have a summer internship program. Teachers and students are invited to come and talk with us."

"The current priority for business is college and apprenticeships; there needs to be a shift to high school and job shadow."

- High school ideas: Summer, 9-month program, career rockets, developers doing presentations at the schools (IT)
- Hands-on activities are much needed for high school students. Bringing the workplace to school through project-based learning is needed. Those projects could be authentic challenges/tasks from local industry partners for students to experience real world problems and scenarios. (IT)
- Needs to be built into the curriculum in high school and then evolve into job shadows and then to internships
- Teacher externships probably need some attention/focus.

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- Internships: A lot of discussion happened around internships, even prior to getting to the WBL conversation. Some feedback is that they need to be mandatory, they need to be more accessible, especially in rural areas, and that they need to be paid in order to attract a more diverse group of people. The people we need to attract cannot afford to do a free internship because that person is probably working a paying job (in high school and college). (CIS)
- Strong success happens when schools have hands-on activities, lab work, contests, and project-based learning. Experience in the classroom embedded into the curriculum translates to being ready to jump in once they're in the workplace.
- Branding/Exposure around government jobs—career exploration opportunities so students can see the variety of work that exists in these areas
- Students genuinely interested in health care
- Presenters genuinely interested in education and working with students
- More hands on the better—cooler, grosser the better (health sciences)
- FAA constraints like 1,500 hours of training (aviation)
- Cost restraints: Financing (aviation)
- Lack of study skills (aviation)
- Mentoring around dealing with personal life issues
- Weather can be a barrier in flight; need to switch to simulations

Opportunities and Barriers in High School (ACM)

- Job shadowing more meaningful than internships at first to see what interests them
 - Less time, more examples of different career fields and occupations
- Internships are more difficult for the employer at this level

Opportunities and Barriers in Post-secondary (ACM)

- Internships: “Education only goes so far; experience is usually a better teacher.”
- Struggle to bridge that gap between theoretical and real-world performance (math and physical systems; how to trust themselves to make decisions)
- Encourage kids to explore so they can get in there and critically think, make risks, and have no long-term implications on their education or careers. Maybe a bad experience would steer them in the right direction, away from something that they didn't enjoy.
 - Corporate vs. government environments or small vs. big companies
- Design, research, and presentation: Getting real-world experience

What are the readiness expectations for students?

- Students need to come with the mindset of what they are contributing to the WBL experience, not just focused on what they're receiving from the experience.
- Intellectually curious, looking for the why, looking deeper than just the immediate WBL experience
- There is a research or educational component for the student so that they understand what a particular department does or what an organization does—some base knowledge—before they arrive at the internship. This shows the employer that they're engaged and ready to work.
- Balance expectations of students so they know it takes time to become an industry professional.
- Students need to know how to ask for help so they don't spin their wheels for weeks and not accomplish anything. It's a different environment than school, and students need to be prepared to speak up and be proactive.
- Work well on a team/Social-emotional skills
- Willing to learn, humble, curious, motivated
- Active-listening skills
- Creative thinking skills; Brainstorming; problem-solving
- Some base technical skills do help or at least some level of interest prior to showing up (Skilled Technical Sciences and CIS)
- Basic employability skills: Showing up, communicating if/when late or unable to show, confirming expectations, checking in, closing the loop on projects
- WBL classroom—worked with students who were going out/portfolio-based
 - They were pleased with the preparations of the students.
- Creativity with regard to entrepreneurship: services, products, disruption of current systems, empowering students to do this now/work can be anywhere/using creativity to reinvent and solve problems—can this be done in the classroom to solve real-world projects happening in the workplace?
- Interested students who really want to participate (This comment was repeated in several sessions; they don't have time for students who don't have an interest in being there; there is a ROI interest for business.)
- Commitment to the organization and to the process
- Students need to create opportunities for themselves as well; be assertive in finding and asking for the work. "If you get the opportunity, make sure you take advantage of everything while you're there."
- Occupation-driven, interest-driven; student choice; compensate them
- Helping them understand their why and to define that purpose—often they don't know

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- Be ready to dive in and learn many different aspects of the agriculture industry—open-mindedness is important (AFNR)
 - Sales, agronomy, software development, marketing, finance—giving different experiences and looking broad scale
 - Crossover days: Be flexible to get more exposure.
- Setting expectations for the students around attire/how to arrive to the experience

“Young workers think it’s a badge of failure if they ask for help.”

““Be honest and tell the truth. You are going to fail and we want you to grow and learn from it.”

Nebraska Career-Readiness Skills Review and Validation

We asked the participants in each panel to do a quick review and validation of Nebraska’s Career-Readiness Skills. They were asked if there was anything in the skills list that they felt no longer applied and/or if there was anything missing with regard to the rapidly changing work environment as identified in the trends. The following are the combined suggestions from all eight Futuring Panels:

- Convey that professional development needs to continue once a student is in a job. Students can be good at applying for a job but then not always successful at continuing to grow professionally once they are in the job.
- Emotional intelligence
- Help students understand that each job they have is one step in building a career. The different jobs that they hold will eventually amount to a career. It is necessary to manage expectations that they are probably not going to walk into their first role and right away be in upper management.
- Underscore the importance of these as skills for life-long career success. These are areas that employees will use and develop for the rest of their work lives.
- Explain to students that these skills have been vetted by business and industry and therefore are important to their future careers.
- Expand the innovation and creativity areas with more concrete language around why those things matter to business.
 - Resource cited: <https://dschool.stanford.edu/about/#about-8-core-abilities> (Provided by Kyle Murphy, Hudl)
- Personal wellness section is thin.
- “Appropriate communication” as a term, can be value-laden (white-culture dominant)
- Leadership and teamwork: A question about whether those were present in the document.
- Personal well-being
 - Mental health and well-being in the job and how that affects family, friends, coworkers, etc.
- Managing their social media presence; digital responsibility and career/legal consequences
- Teamwork and teambuilding are critical; conflict resolution is also really important.
- Accountability is huge—teams are a more fluid type of management system that many companies are moving toward.

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