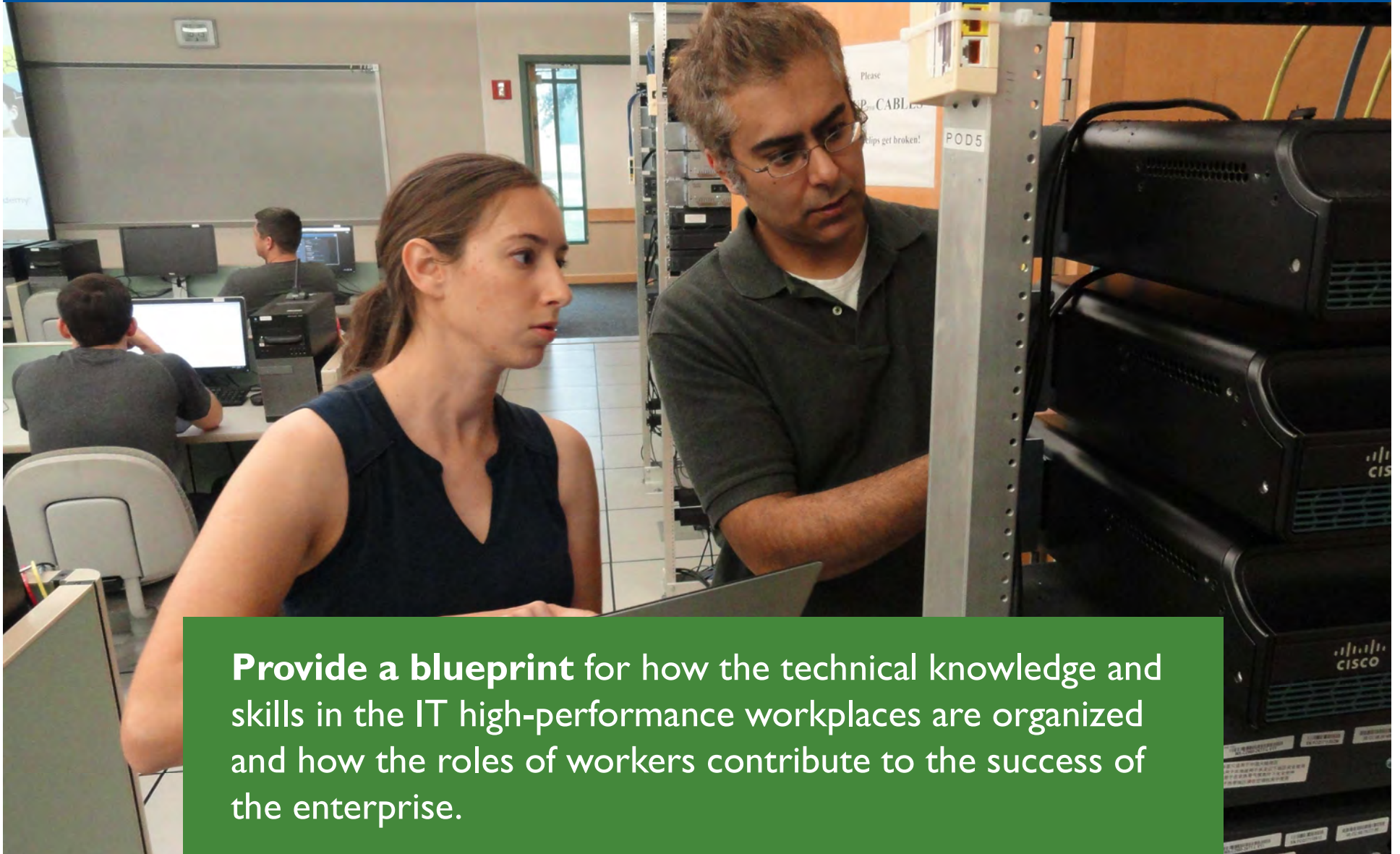


Collaborating with Employers to Create Future-Facing Technician Skill Standards

HITEC July 2024



WHY ARE SKILL STANDARDS IMPORTANT?



Provide a blueprint for how the technical knowledge and skills in the IT high-performance workplaces are organized and how the roles of workers contribute to the success of the enterprise.

WHY ARE SKILL STANDARDS IMPORTANT?



They make IT careers more accessible to students and employers because they provide transparency regarding the knowledge, skills, and abilities (KSAs) as well as the performance needed for success in the job market.

WHY ARE SKILL STANDARDS IMPORTANT?



Business and Industry want to hire students who can integrate products, not just one-vendor experts.

WHY ARE SKILL STANDARDS IMPORTANT?



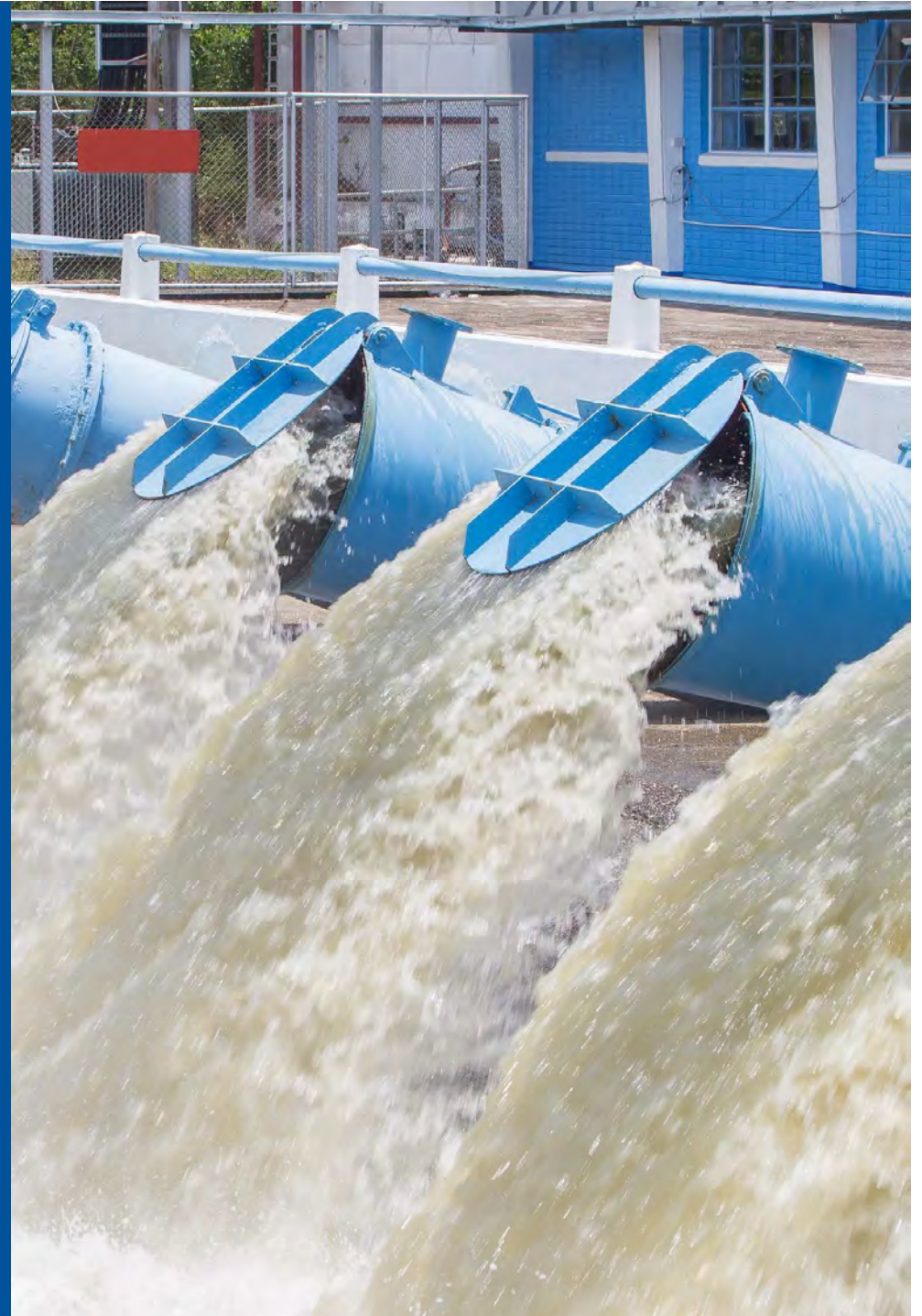
EDUCATORS use skill standards to create curriculum that is relevant, current, and future-facing to better prepare students to meet employers' job requirements.

EMPLOYERS use skill standards to improve communications about job openings so they hire the most qualified candidates to address their current and emerging needs, and to improve their internal training and development.



PURPOSE

- **WIDEN** the pipeline of qualified IT workers.
- **CREATE** a contemporary and future-facing set of IT Skill Standards.
- **ASSIST** both employers and educators to more easily apply the standards.





PRODUCTS

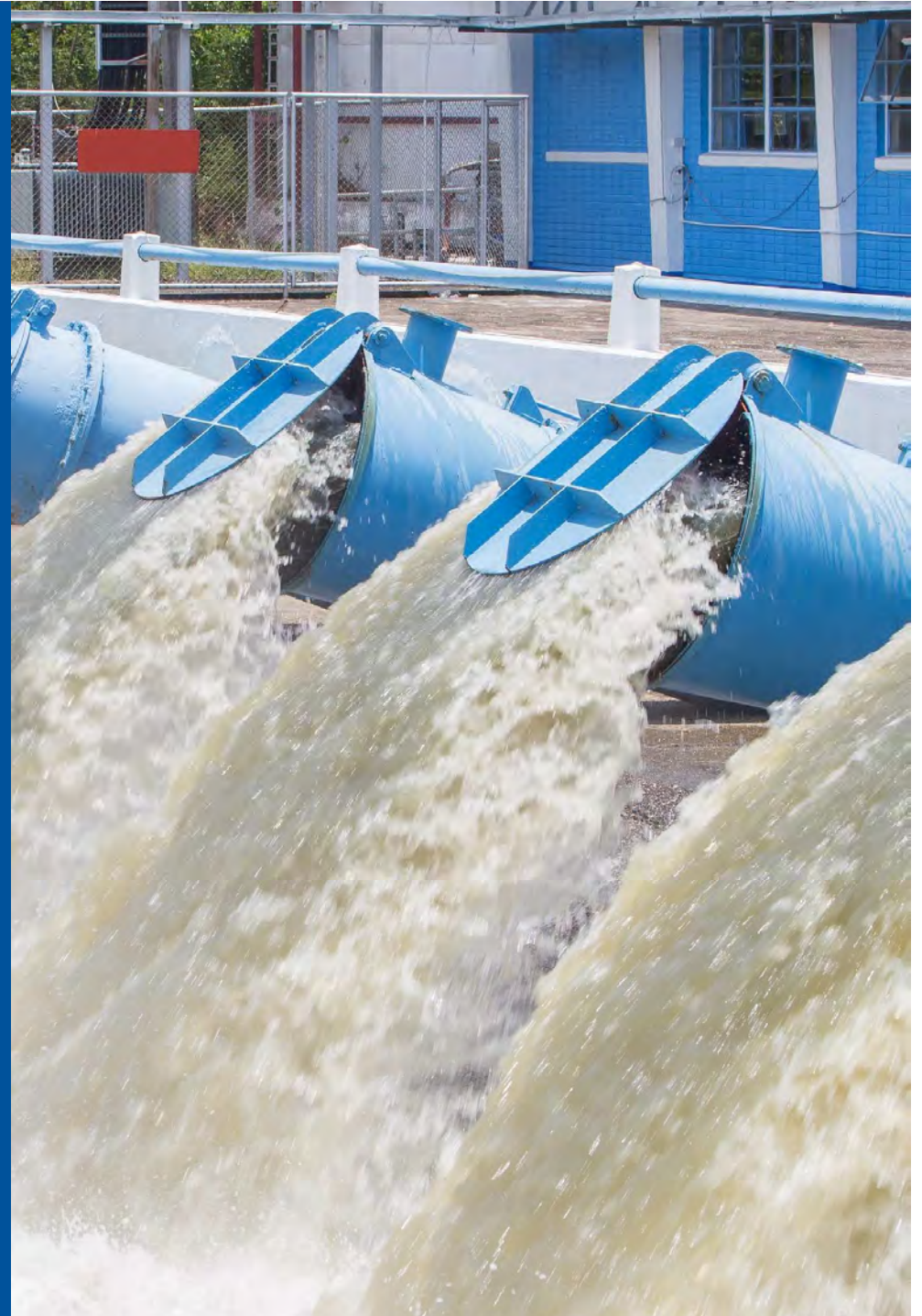
Four skill standard products

Created by Employer SMEs

1. Tasks + KSAs with numerical average of votes
2. Key Performance Indicators (KPIs) for Tasks
3. Levels of Key Employability Skills

Created by Educator SMEs
(building on Employer SME work)

4. Student Learning Outcomes to help create/update curriculum





ENGAGES EMPLOYERS

- **BUSINESS AND INDUSTRY LEADERSHIP TEAM (BILT)** process is the basis for work with employers to identify what they want graduates to know 12-36 month into the future.
- **EMPLOYERS CO-LEAD** the work, not just advise.



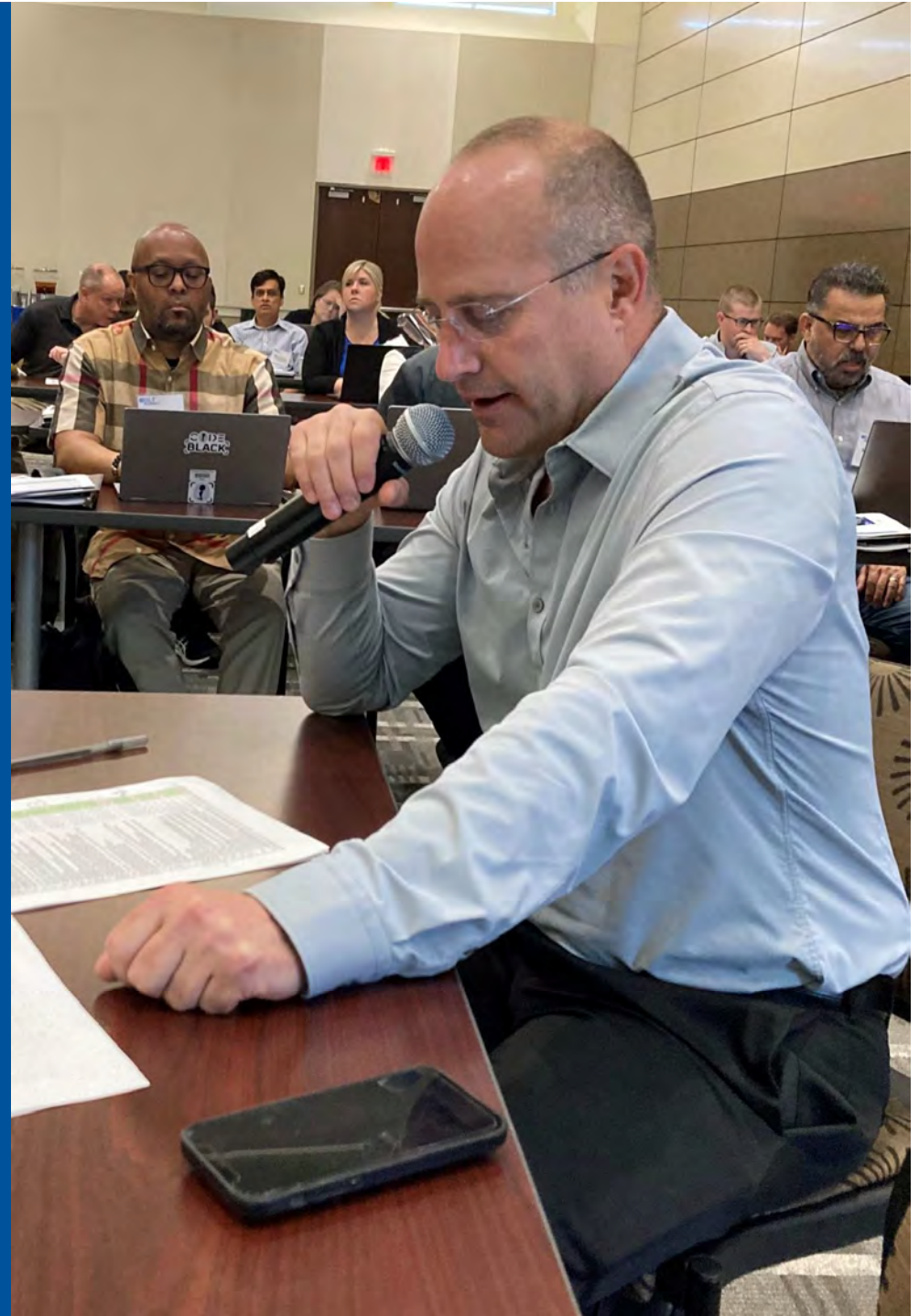


ENGAGES EMPLOYERS

Employers have reported they are more likely to hire graduates from programs for which they have **curricular co-leadership** responsibility.

Employers will assume this role because...

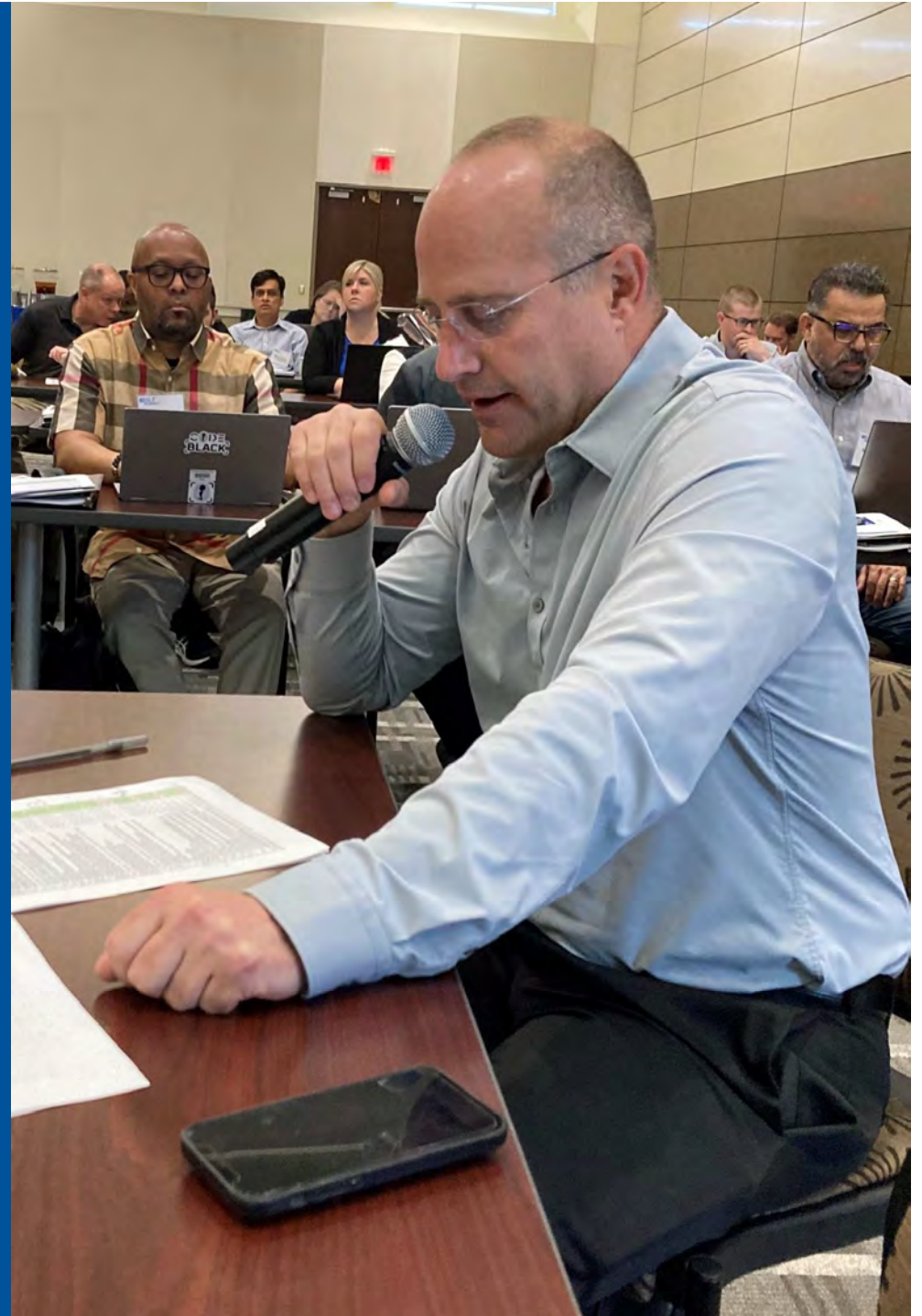
- Their time is respected
- There is a method for ensuring their input is consistently and seriously considered by faculty members
- They consistently receive feedback on their recommendations





ENGAGES EMPLOYERS

BILT Model created by the
National Convergence Technology
Center



DIFFERENCES BETWEEN BACs and BILTs

Business Advisory Council

May meet once or twice a year

May “rubber stamp” existing program

Faculty may drive meeting agenda

May only give advice and suggestions

Job skills recommendations delivered through discussions

May not be highly invested in success of the program

May not be kept in the loop on how suggestions implemented

BILT

Meets quarterly

Actively helps faculty improve the program

Employers help develop agenda – especially sharing trends

Co-leads

Job skills recommendations created through voting process

Feels an ownership in the program and its students

Regularly informed on how suggestions implemented

BILT

ANNUAL CYCLE

Two goals of a BILT

- Build relationships
- Align curriculum to workforce needs



BILT

ANNUAL CYCLE

- Building and maintaining a thriving BILT is a **high-touch activity** with frequent **two-way communication**.
- Know your BILT members' "WIIFM" – what's it in for me?
- Emphasis on growing a pipeline of right-skilled job candidates.



BILT

ANNUAL CYCLE

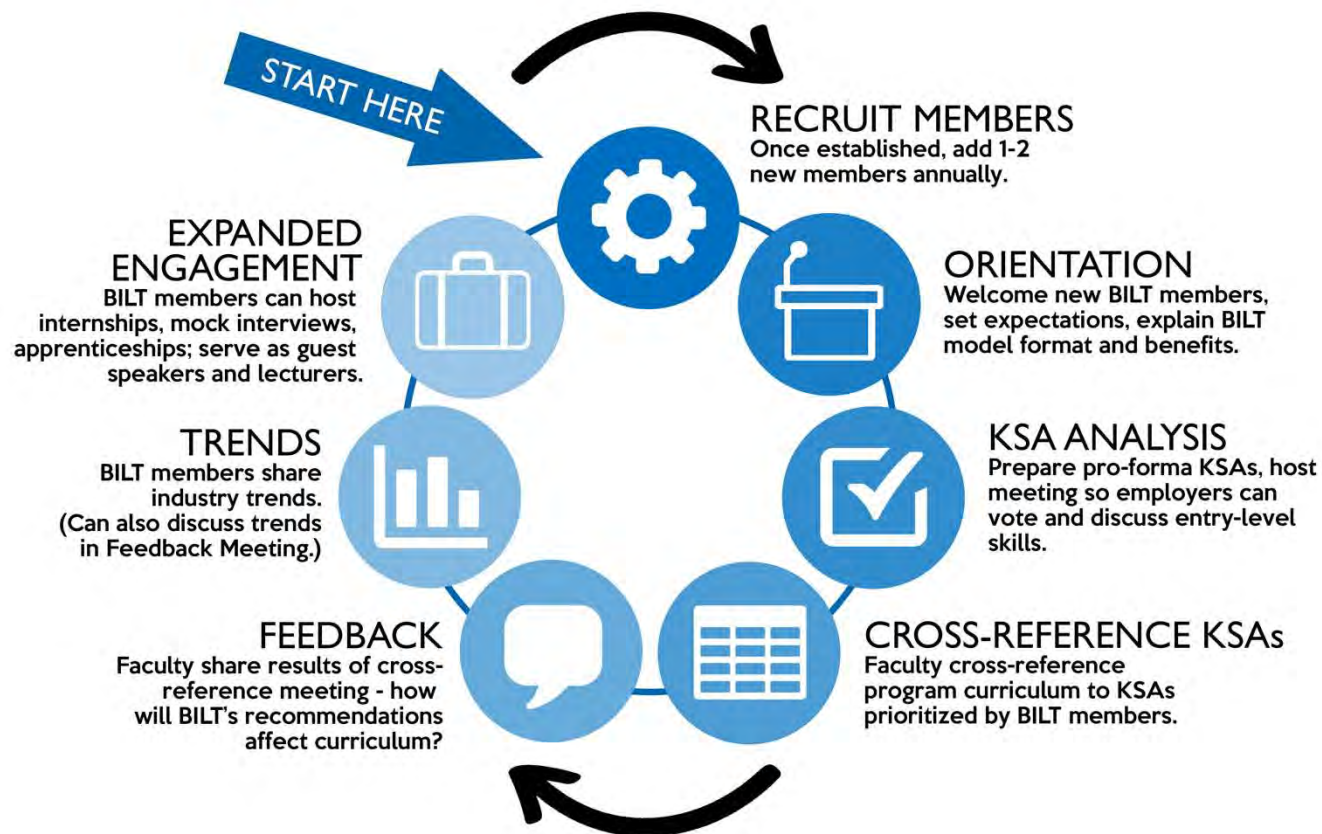
- **KSA analysis** meetings (Initial and annually, single 2-2½ hour meeting).
- **Industry Trends/ Feedback** meetings are held 2 times per year via web-meeting software to get ahead on the updates.



BILT

ANNUAL CYCLE

Annual BILT Cycle





APPLYING BILT TO THE ITSS PROCESS

- Thought Leaders
- Employer SMEs
- Educator SMEs
- Product





THOUGHT LEADERS

Identified Critical Job Clusters

- Approximately 100 Thought Leaders were recruited and vetted to identify the first set of project Job Clusters
- Thought Leaders are typically CTOs, CIOs, CISOs or other individuals responsible for “seeing the future” to keep their companies in business.





THOUGHT LEADERS

Identified Critical Job Clusters

- Goal was to identify 8-10 of the most critical and difficult to fill job clusters for the future through four facilitated meetings
- Project team synthesized results





THOUGHT LEADERS

Identified Critical Job Clusters

- Employer consensus was obtained for 7 job clusters initially
- A second set of Thought Leader meetings were held to identify remaining 2 to 3 clusters





THOUGHT LEADERS

Job Cluster Definition - The Thought Leaders defined what each job cluster included

“Technical Project Management comprises the planning and management of a technical initiative from concept through to a concrete deliverable. This includes overall responsibility for outcomes and requires specific knowledge of technologies, applied methodologies and development models to ensure success in planning, managing budget, estimation and execution of the project. Additionally, this area is responsible for change management. The Technical Project Management serves as the liaison between the business and technical experts. This definition was adapted from Iasa Global with input from national IT Thought Leaders.”



FIRST SEVEN CLUSTERS IDENTIFIED

Skill standards completed

1. Infrastructure Connectivity Administration and Engineering
2. Technical Support
3. Technical Project Management
4. Software Development Engineering
5. Data Management and Engineering (the IT side of Data)
6. Data Analytics and Predictive Modeling

Skill set completed

1. Cybersecurity



EMPLOYER SMEs

- **The Project Team compiled pro forma KSAs and Tasks** for employer evaluation using a variety of existing skill standards (e.g. NICE and NIST, ACM, various state standards) – no reinvention of the wheel





EMPLOYER SMEs

- **Employer SMEs voted** on the pro forma KSAs and Tasks they want workforce ready grads to do/have in the future using the structured, repeatable process from the BILT, followed by discussion
- **Employer SMEs could add, change, and delete** items during the 2-3 meetings per job cluster that were held





EMPLOYER SMEs

- **Employers identified the appropriate level of Employability Skills needed per job cluster**
- **ITSS worked with ~250 different business SMEs over first 6 job clusters**





WHAT IS A PRO FORMA KSA LIST?

Do not start with a blank wall

- A starting point that provides metrics for discussion – a best estimate of knowledge/skills
- Approximately 70-120 of mostly knowledge and skills (abilities will be discussed later)
- BILT members vote electronically on each item regarding importance for curriculum
- Prioritized results are automatically tabulated and displayed for purposes of discussion
- Employers may add, subtract, or modify items on the list
- Synchronous discussion is **extremely important** and is based on prioritized knowledge and skills as well as distribution of votes

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	C	D	E	F	G	H	I
1	Technical Project/Program Management						
		<i># votes</i>					
		<i>(4 = most important)</i>					
2	ic	4	3	2	1	Avg	Comments
4	Develop project plans, including defining scope and time requirements.	22	6	2	0	3.67	
5	Identify information technology project resource requirements.	19	9	2	0	3.57	
6	Develop guidelines for system implementation.	6	10	11	3	2.63	
7	Follow methods to monitor and measure risk, compliance, and assurance efforts.	13	10	6	1	3.17	
8	Perform needs analysis to determine opportunities for new and improved business process solutions and participate in determining opportunities for new and improved business process solutions.	13	12	3	2	3.20	
9	Contribute contingency plans regarding project risks.	13	12	5	0	3.27	
10	Identify interdependencies.	20	6	4	0	3.53	
11	Identify and track critical milestones.	24	6	0	0	3.80	
12	Report project status.	28	1	1	0	3.90	
13	Participate in project phase review.	26	3	0	1	3.80	
14	Coordinate and manage the overall expectations provided to a customer/project stakeholder end-to-end as it relates to the project.	13	4	9	4	2.87	
15	Gather feedback on customer satisfaction and internal service performance to foster continual improvement.	19	7	4	0	3.50	



KSAs and TASKS

This is a snippet of a KSA and Task list.

The entire list contain a minimum of 100 items across all sections.

We will do a live demo later in this presentation.

Technical Support Tasks and KSAs		
		Avg
Tasks		
SPECIFIC THINGS an entry level person would BE EXPECTED TO PERFORM on the job WITH LITTLE SUPERVISION.		
Install, Configure, Update, Maintain		
T-1	Install and maintain network infrastructure device operating system software (e.g., IOS, firmware).	3.0
T-2	Install and configure hardware, software, and peripheral equipment for system users in accordance with organizational standards.	3.7
T-3	Manage changes/updates for both internal and external customers when policies and procedures change.	3.4
T-4	Maintain computer hardware.	3.6
T-5	Provide technical support for software maintenance or use.	3.7
Knowledge		
Knowledge focuses on the understanding of concepts. It is theoretical. An individual may have an understanding of a topic or tool or some textbook knowledge of it but have no experience applying it. For example, someone might have read hundreds of articles on health and nutrition, many of them in scientific journals, but that doesn't make that person qualified to dispense advice on nutrition.		
K-1	Knowledge of the basic operation of computers.	3.9
K-2	Knowledge of computer networking concepts and protocols, and network security methodologies.	3.5
K-3	Knowledge of operating environments, organizational software and applications.	3.6
K-4	Knowledge of practices of internal, external, and global customers (as applicable).	3.2
K-5	Knowledge of internal organizational communication processes.	3.3
Skills		
The capabilities or proficiencies developed through training or hands-on experience. Skills are the practical application of theoretical knowledge. Someone can take a course to gain knowledge of concepts without developing the skills to apply those concepts. Development of skills requires hands-on application of the concepts.		
S-1	Skill in identifying possible causes of degradation of system performance or availability as well as skill in initiating actions needed to mitigate this degradation.	3.3
S-2	Skill in using the appropriate tools for repairing software, hardware, and peripheral equipment of a system.	3.4
S-3	Skill in conducting research for troubleshooting novel client-level problems.	3.1
S-4	Skill in configuring and validating network workstations and peripherals in accordance with approved standards and/or specifications.	3.4



EMPLOYABILITY SKILLS

Three possible levels

Focuses on these 11 areas

- Workplace Professionalism & Work Ethics
- Written Communication
- Oral Communication
- Teamwork
- Problem Solving & Critical Thinking
- Organization & Planning
- Adaptability & Flexibility
- Initiative
- Accuracy
- Cultural Competence
- Self Development & Career Development



EMPLOYABILITY SKILLS

Technical Support Employability Skills

Workplace Professionalism & Work Ethics	<p>Level 1 - Employee learns expectations of workplace environment (professional behavior and ethics) and adheres to practices with some guidance.</p> <p>Level 2 - Employee exhibits sound professionalism, judgment, and integrity and accepts responsibility for own behavior. Employee exhibits these qualities without guidance but occasionally refers to policies as needed.</p>
Written Communication	<p>Level 1 - Employee understands written instructions and executes tasks with guidance and feedback from supervisor. Employee clearly communicates concepts in writing.</p> <p>Level 2 - Employee comprehends and executes written instructions with minimal guidance. Employee composes well-organized written documents.</p>
Oral Communication	<p>Level 1 - Employee understands oral instructions and executes tasks with guidance and feedback from supervisor. Employee communicates concepts orally while clarifying for meaning. Employee develops listening skills.</p> <p>Level 2 - Employee comprehends and executes oral instructions with minimal guidance and exhibits good listening skills. Employee clarifies for meaning without needing prompting from supervisor.</p>
Teamwork	<p>Level 1 - With guidance and feedback from supervisor, employee obeys team rules and understands team member roles. Employee actively participates in team activities, volunteers for special tasks, and establishes rapport with co-workers.</p> <p>Level 2 - Employee demonstrates commitment, enthusiasm and supports team members. Employee follows up on assigned tasks and leads by example.</p>



AFTER CLUSTER MEETINGS

Project team synthesized data across meetings (votes + discussion)





AFTER CLUSTER MEETINGS

Employer SMEs at follow-up meeting...

- **Verified** the synthesis done by the team and changed anything they did not approve
- **Voted** on Key Performance Indicators (KPIs) for Tasks

Employer SMEs additionally...

- Assisted with dissemination
- Provided ideas to sustain updates





AFTER CLUSTER MEETINGS

Educator SMEs also developed **Student Learning Outcomes** after the second employer SME meetings (huh?)

Educator SMEs additionally...

- Assisted with dissemination
- Participated in discussions regarding what can be reasonably expected to be covered in 2-yr and in 4-yr Applied Technology Degrees





PRODUCTS

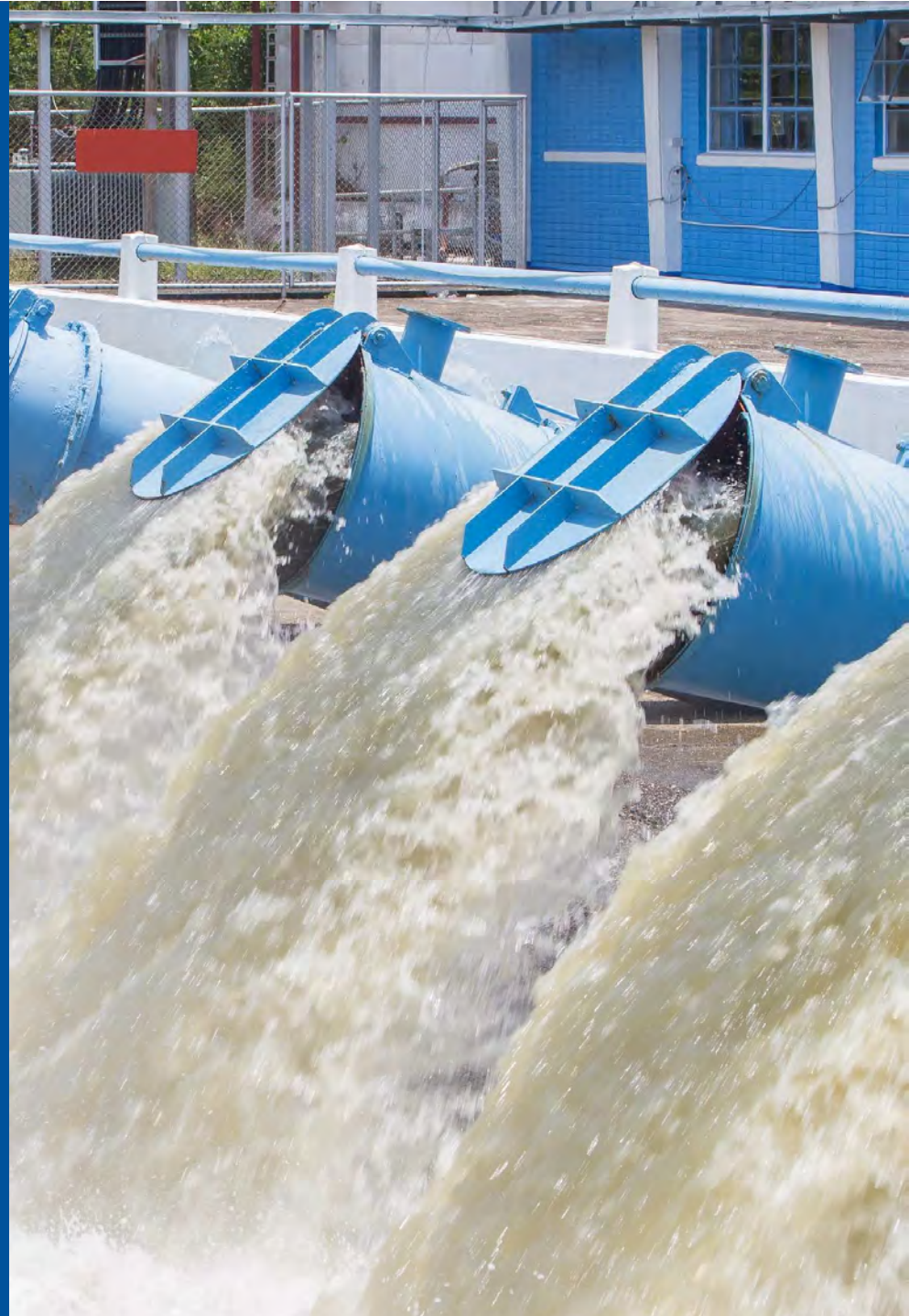
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PRODUCTS AVAILABLE PER CLUSTER

ITskillstandards.org

Provide name, school, and email to access content

NATIONAL CONVERGENCE TECHNOLOGY CENTER

Wiki Educators Students Businesses Resources About Media Subscribe ITSS 2020

SEARCH

IT SKILL STANDARDS BEYOND 2020

ACCESS IT SKILLS STANDARDS TO ENHANCE YOUR PROGRAM

Future-facing [skill standards](#) created in collaboration with IT thought leaders (mostly CIOs and CTOs) and other industry leaders for the most immediate and critical IT job clusters. To access the [skill standards](#) for a given cluster, click on the job cluster name in green. Additional [skill sets](#) coming soon.

- SOFTWARE DEVELOPMENT
- TECHNICAL PROJECT MANAGEMENT
- TECHNICAL SUPPORT
- DATA ANALYTICS & PREDICTIVE MODELING
- CYBERSECURITY SKILLSET
- DATA MANAGEMENT AND ENGINEERING
- INFRASTRUCTURE CONNECTIVITY MANAGEMENT AND ENGINEERING

JOIN A MEETING TO GET INVOLVED

EMPLOYERS & EDUCATORS | Skill Set Meetings

[REGISTER HERE](#)

EDUCATORS | Professional Development

ITSS Awareness Sessions

Tuesday, June 28th, 2:00 pm - 2:30 pm

Thursday, June 30th, 10:00 am - 10:30 am

[REGISTER HERE](#)

PRODUCTS AVAILABLE PER CLUSTER

ITskillstandards.org

Provide name, school, and email to access content

Please submit the form below to receive an email with the Technical Project Management Skill Standards.

* indicates required fields

Name *

First

Last

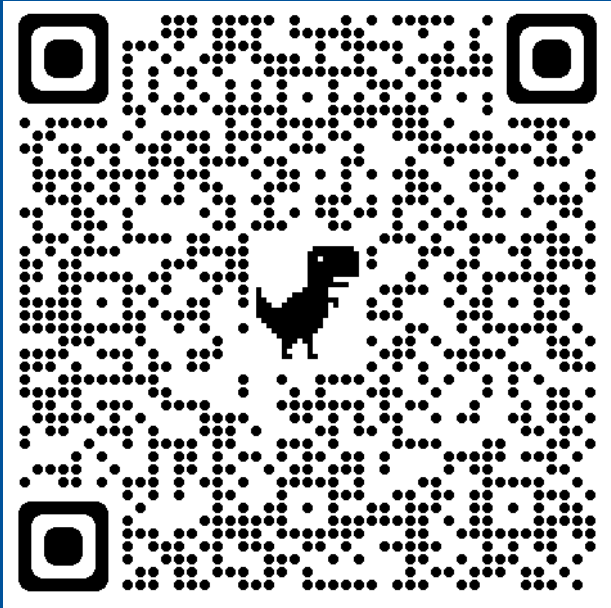
Organization *

Email *

SUBMIT

IT SKILL 2020
STANDARDS AND BEYOND

KSA VOTING DEMO





USING THE ITSS PRODUCTS

- Gap analysis

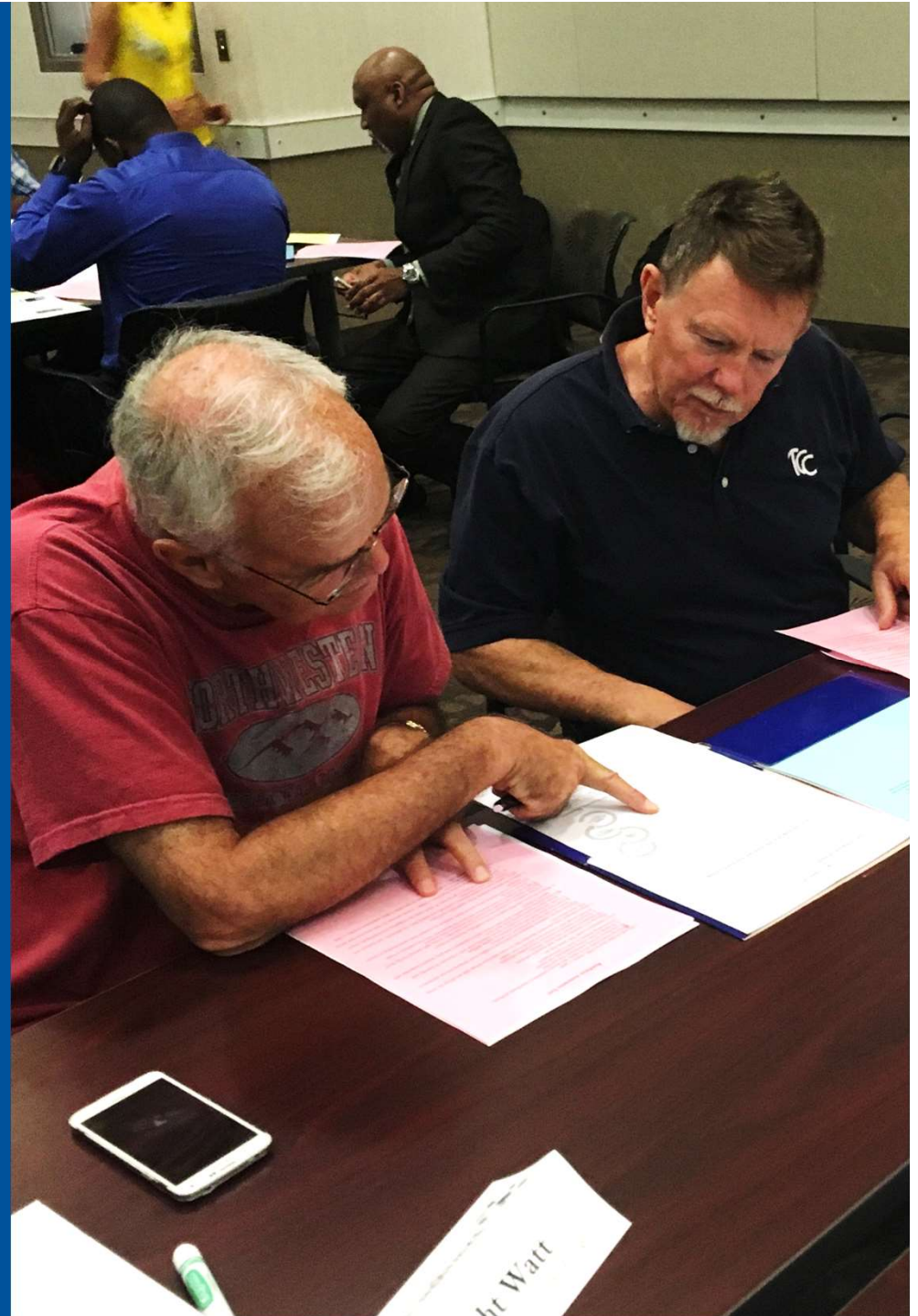




GAP ANALYSIS

Conduct a Gap Analysis

- Identification of the gaps with consideration for how to fill the gaps
- Identification of the items with just exposure coverage



GAP ANALYSIS

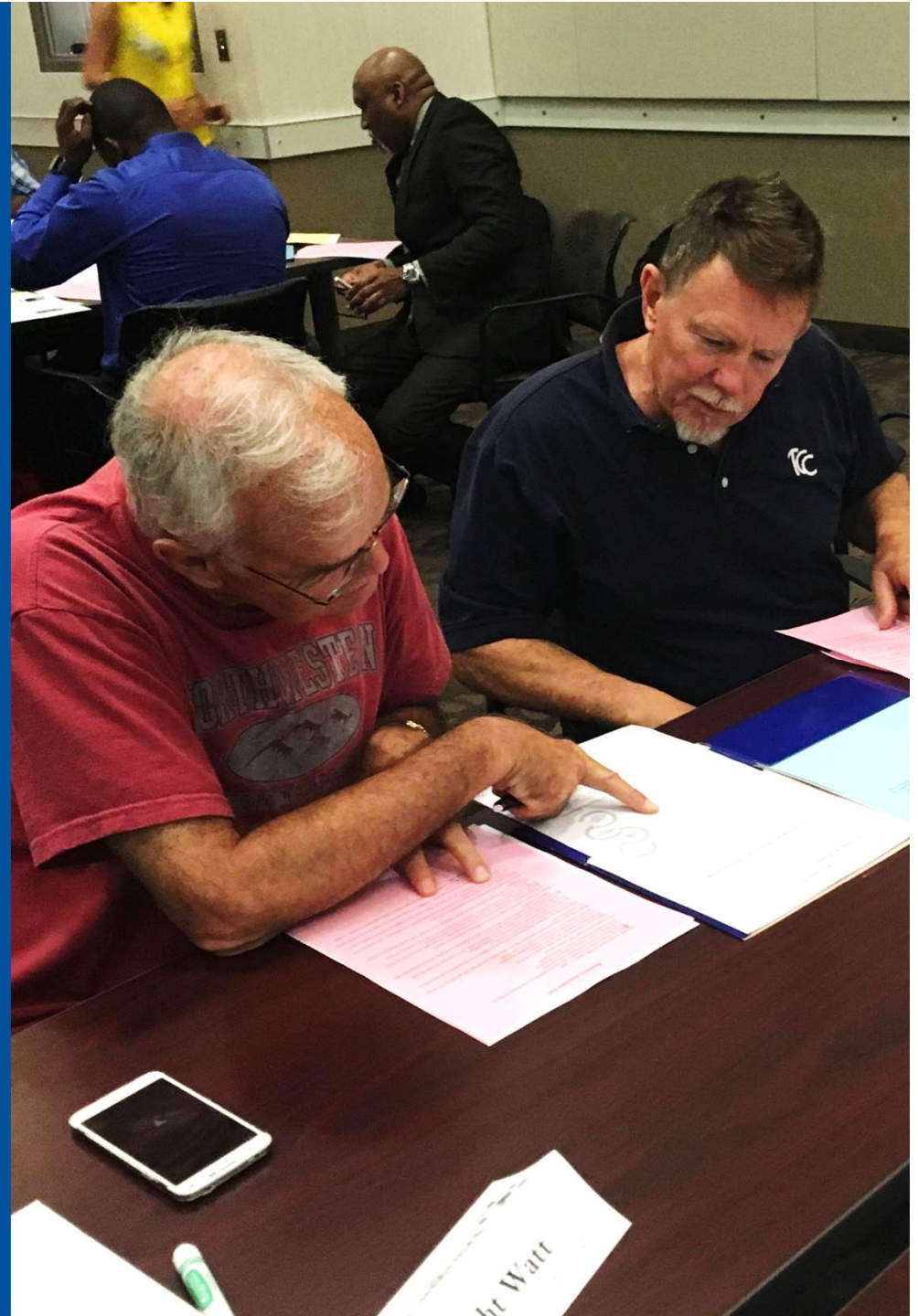
Ks		Avg	Course A	Course B	Course C	Course D	Course E	Course F	Course G	Es
K-41	Knowledge of risks associated with storing various types of data in different physical locations.	2.64	E	E		E		T		
K-42	Knowledge of infrastructure data storage capabilities and storage clusters.	2.91				E			E	
K-43	Knowledge of IoT end devices and connectivity.	2.82	E	E		E		T		
K-44	Knowledge of Software Defined Networking concepts.	3.18			E					
K-45	Knowledge of database theory.	2.18								
K-46	Knowledge of Continuous Quality Improvement Principles (of particular value: Lean and Agile).	2.36				E	E	T		
K-47	Knowledge of how to balance organization goals with system architecture (i.e. know your business).	2.82	E	E				T		
K-48	Knowledge of Python or other scripting languages.	2.82	E	E		T			E	



GAP ANALYSIS

For **existing** programs

- Compare the KSAs, Tasks, and SLOs from the ITSS website to your own curriculum content and outcomes



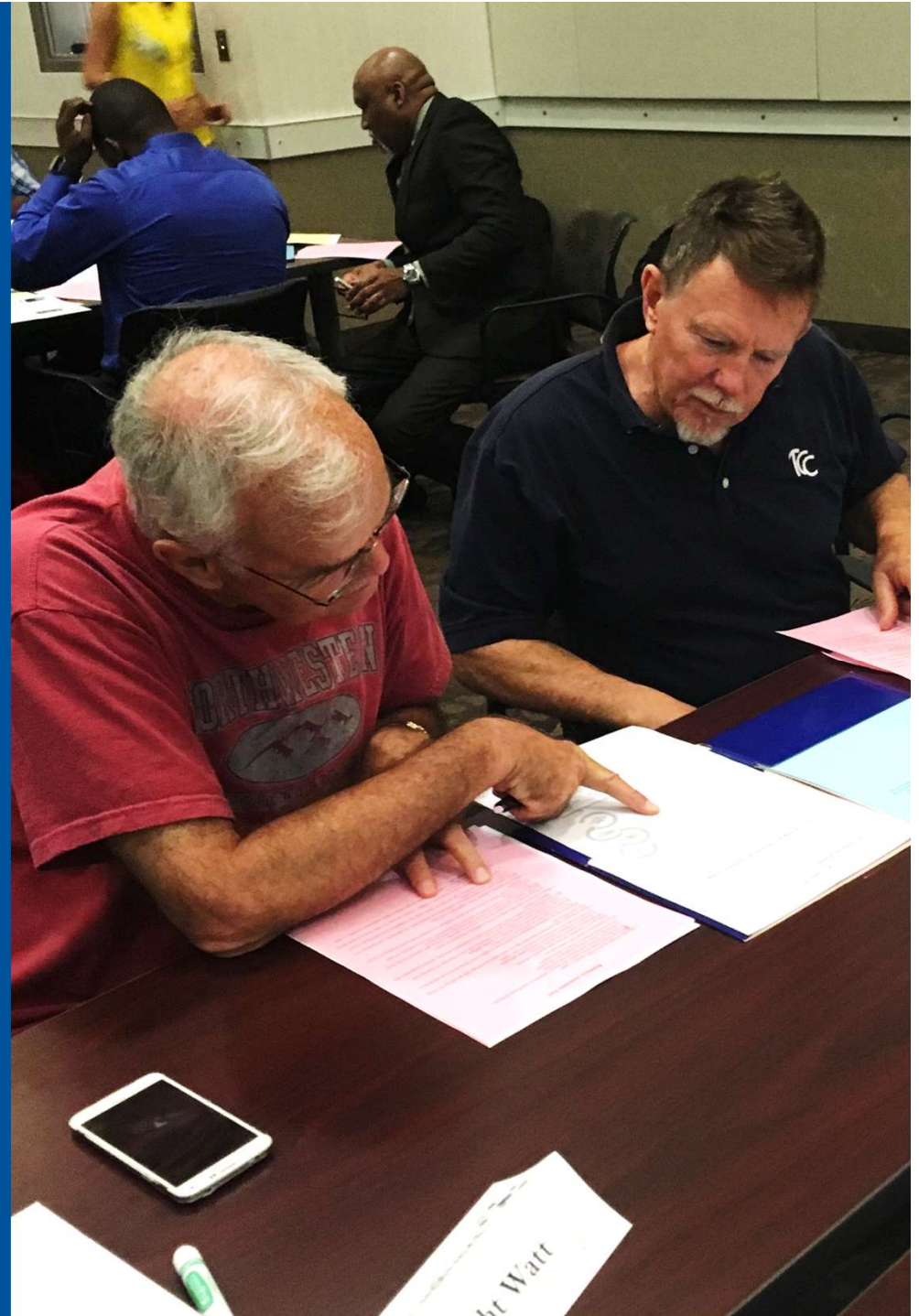


GAP ANALYSIS

For **existing** programs

- Use the comparison as fuel for discussion for the next faculty meeting

Note: some changes may require new modules or tweaks to existing modules, not whole new courses and may be able to be rapidly implemented.

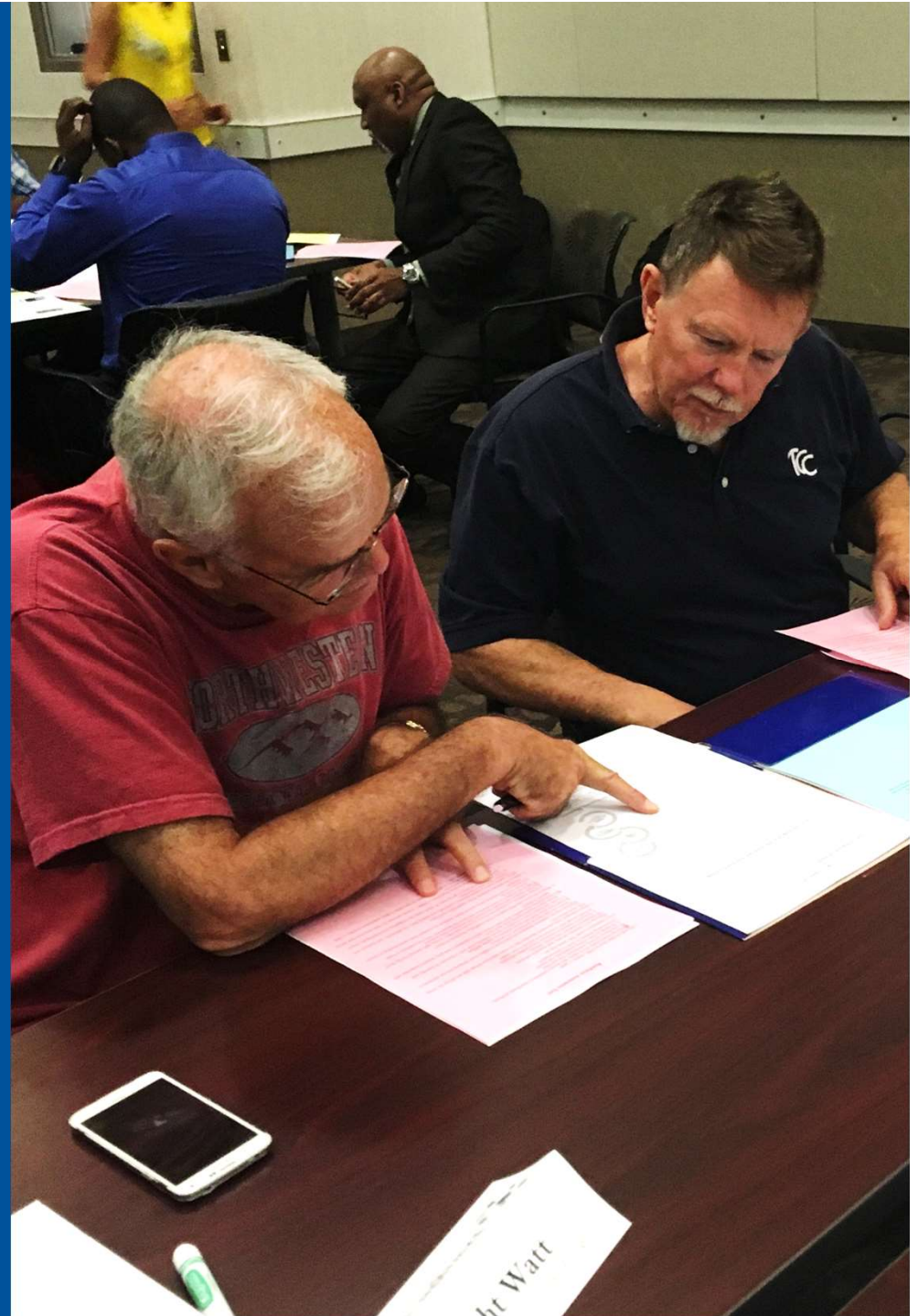




GAP ANALYSIS

For **existing** programs

- Use the comparison information working with your next BILT meeting to consider curricular updates.

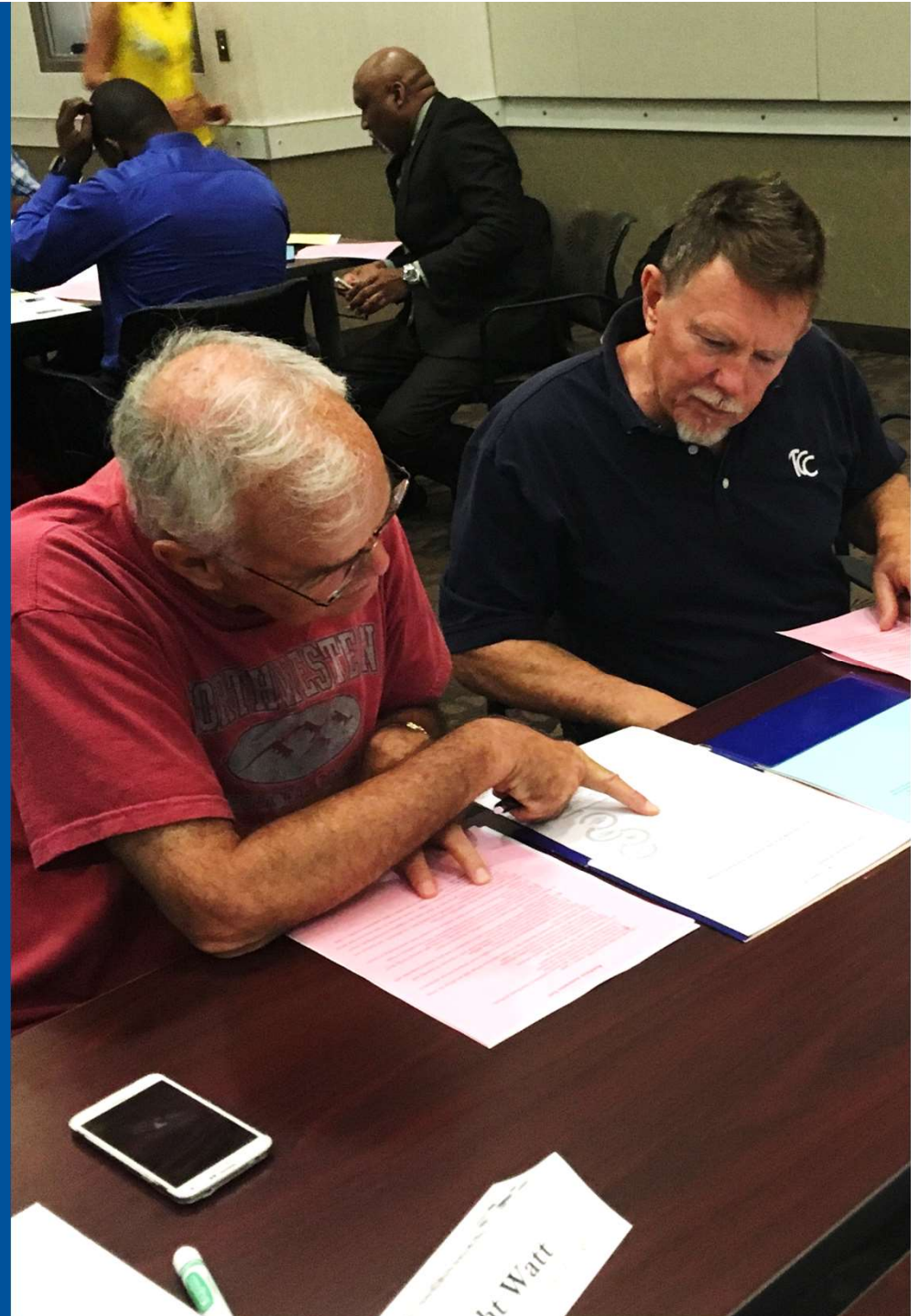




GAP ANALYSIS

For **new** programs

- Validate/clarify the KSAs and Tasks from the ITSS website with your employers at your next meeting, and use the KSA process to determine how curriculum might be created (adapted) to implement a new program

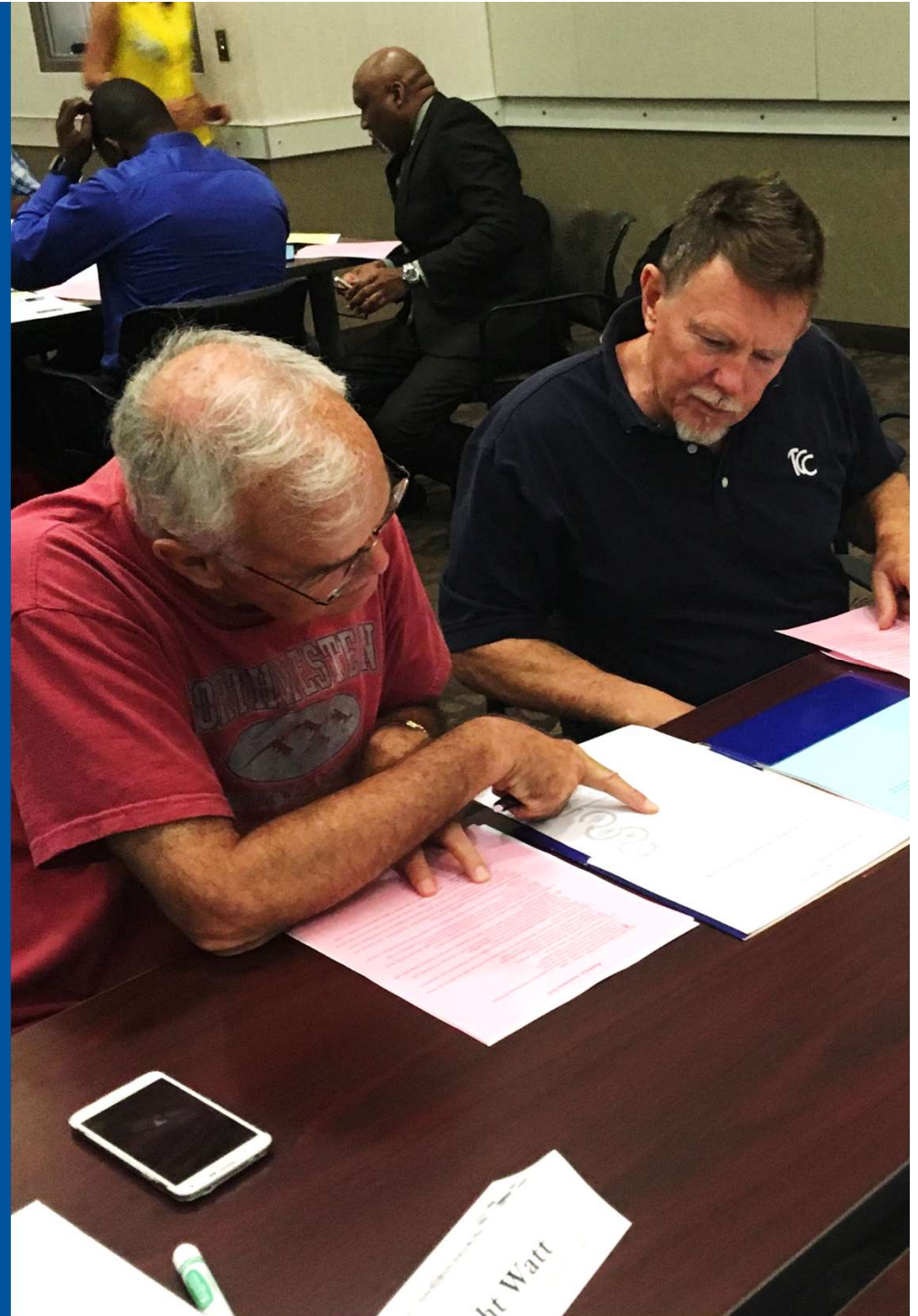




GAP ANALYSIS

For new programs

- Be sure to consider labor market demand into the future as new programs take time to construct and obtain approval.





FINAL STEPS

Last steps for developing skill standards

- SME verification meeting
- Creation of KPIs (Key Performance Indicators)
- Creation of SLOs (Student Learning Outcomes)





NITIC

National Information Technology
Innovation Center

www.NITIC.org

- * Clearinghouse for IT educator curriculum and resources
- * Employer-led job skills and industry trends
- * National IT educator community of practice
- * “Train the trainer” faculty professional development
- * Best practices for recruiting and supporting underserved populations

[Join the mailing list](#)



CONTACT US

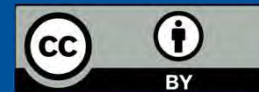
ITSS website
www.ITskillstandards.org

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Legacy Resources



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