Final Report

Standards Alignment to Industry Clusters Initiative

Texas Workforce Commission Mission:

To promote and support a workforce system that creates value and offers employers, individuals, and communities the opportunity to achieve and sustain economic prosperity.

Contents

I. DESCRIPTION OF THE PROJECT

The Standards Alignment to Industry Clusters (SAIC) project is an initiative of the Texas Workforce Commission. The project was conducted from June 2017 to August 2018. The SAIC initiative's objective is to align Texas Adult Education and Literacy Content Standards with knowledge, skills, and abilities required for success in high-demand entry- and intermediate-level jobs that have career potential. There are four target industry clusters:

- Advanced Manufacturing
- Construction and Extraction
- Healthcare Sciences
- Transportation, Distribution, Logistics

The methodology used to focus on high-demand jobs in the four target industry clusters can be applied to other sectors through the use of an online database for career exploration and job analysis, O*NET (the Occupational Information Network sponsored by the U.S. Department of Labor). More information about O*NET and the process that was used is provided in Section II (Review of SAIC Activities).

The SAIC initiative is designed to help educators, workforce development specialists, and other stakeholders better target and contextualize instruction and career counseling to prepare students for successful employment. There are no changes to the standards in the three Content Areas.

- English Language Arts and Literacy
- Mathematics
- English as a Second Language

PARTNERS AND TEAMS

There are four primary partners in the SAIC initiative.

- **Literacy Texas** – the statewide literacy coalition, connecting and equipping literacy providers through resources, training, networking, and advocacy.

- **Educational Testing Service (ETS)** – the world's largest educational assessment and research organization.

- **National Center for Construction Education and Research (NCCER)** – dedicated to developing "a safe and productive workforce [through a] standardized training and credentialing program for the industry."

- **Haigler Enterprises International, Inc.** – a consulting firm with extensive experience in adult literacy, workforce analysis, public-private partnerships, and academic and skills standards.

The SAIC work was supported and validated by more than three dozen industry and adult educators and literacy (AEL) subject matter experts. The SAIC experts met in person and virtually during the SAIC initiative. A timeline of the project milestones is below.

Timeline and Milestones

- June 2017 – Project Launch
- October 2017 - January 2018 – Industry Cluster Meetings
- February 2018 – Build Bridge for Adult Educators & Literacy Providers
- March 1, 2018 – Adult Education and Literacy Providers 1st meeting
- March 22 – 23, 2018 – AEL Virtual Meetings
- April 17, 2018 – Adult Educators & IC Workshop
- May – June 2018 – Draft Reports Developed

SAIC RESEARCH

The Educational Testing Service (ETS) led the research effort to identify high-demand occupations in the four target industry clusters and related critical characteristics across the jobs. Additional job-related information was provided by the Industry Cluster and AEL subject matter experts.

The main components and activities involved in SAIC research are summarized below.

O*NET. O*NET (www.onetonline.org) is a primary source of occupational information in the United States. The O*NET database includes hundreds of standardized, occupation-specific descriptors on more than 900 jobs.

High-demand Jobs. ETS identified high-demand jobs for each of the four industry clusters based on data from Texas Workforce Commission reports (2015/2016) and jobs in O*NET that show positive growth projections in Texas (15% or more) from 2014-2024.

Critical Characteristics. ETS used O*NET to conduct research on every knowledge, skill, ability, work activity, and workstyle for Texas high-demand jobs for each of, and across, the four industry clusters. ETS calculated the mean (to show overall high level of importance) and Standard Deviation (to represent the range spread of characteristic importance). ETS used these to identify the critical characteristics that were focused on high importance across the majority of the jobs.

Examples of critical characteristics across jobs and sectors include:

Active Listening	Reading Comprehension
Adaptability/Flexibility	Speaking
Cooperation	Writing
Mathematics	Written Comprehension
Oral Comprehension	Written Expression

Real-world Work Examples. The Industry Cluster experts provided specific work-related examples tied to positions and tasks in their sectors. The AEL experts conducted research about high-demand entry- and intermediate-level jobs in O*NET to confirm these critical characteristics.

The project team developed draft documents that aligned the standards with the work-related information. The subject matter experts provided feedback and validated the information.

Here is an example of an alignment of a standard and benchmark with O*NET elements, O*NET detailed work activities and industry examples:

ENGLISH AS A SECOND LANGUAGE

Subarea 1.2 – Reading

D. Comprehension of a Variety of Informational Texts. Describe, analyze, and evaluate diverse informational texts, and identify supporting evidence from the text to support understanding.

Benchmark	O*NET Elements	O*NET Detailed Work Activity	Industry Examples
1. Identify and distinguish differences in structure and purpose for a range of informational texts, regardless of print or digital presentation mode (e.g., textbooks, biographical sketches, letters, diaries, **directions, procedures,** magazines, essays, primary source historical documents, editorials, news stories, periodicals, catalogs**, manuals, procedures and other job-related materials, schedules**, speeches, memoranda, public documents, and maps).	**Reading Comprehension.** Understand written sentences and paragraphs in work-related documents. **Attention to Detail.** Be careful about detail and thorough in completing work tasks.	Interpret blueprints, specifications, or diagrams to inform development of operation activities. Read work orders or other instructions to determine product specifications or materials requirements. Stay informed about current developments in field of specialization.	**Industry: Construction and Extraction** **Position: First-line Supervisor,** **Example:** Reads specifications, such as blueprints, to determine construction requirements or to plan procedures. **Industry: Construction and Extraction** **Position: HVAC Technician** **Example:** Reads to understand manufacturer's detailed instructions for installation of equipment, safety procedures and material data sheets (MDS). **Industry: Transportation, Distribution, Logistics** **Position: General Warehouse, all functions** **Example:** General Warehouse – Drivers, all clerks, and management at every level must have reading comprehension for basic items such as handbooks or policy. More deductive can be standard operating procedures for specific tasks.

Additional information about the ETS research methodology is provided in an Appendix to this document.

SAIC REPORTS

Texas Adult Education & Literacy Content Standards 2.0

The primary SAIC deliverable is the Standards 2.0 document.

It is designed for educators, workforce development specialists, and other stakeholders dedicated to preparing students for successful jobs and careers. It aligns the standards, subareas, and benchmarks with work-related information as in the example provided above. The work-related information includes O*NET knowledge, skills, abilities, work styles, and detailed work activities. It also includes specific examples from the four target industry clusters that were provided by industry cluster experts or identified in O*NET.

Final Report. This report is written for those interested in the background, process, and findings of the SAIC initiative. Audiences may include employers, workforce development organizations and specialists, policy makers, researchers, educators, and others with a focus on preparing adult learners for successful employment and strengthening the Texas economy. The report includes information on SAIC purpose and activities, research, participants, project outcomes, and related best practices.

PowerPoint Presentations. The project deliverables include two PowerPoint presentations – one for each of the reports.

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From the early days of the SAIC initiative, participants – particularly employers – said that the SAIC initiative should not result in "a report that just sits on a shelf." This belief underscores the sense of urgency expressed by employers and adult educators that this is a timely opportunity to help students achieve jobs and careers that match their interests, talents, and experiences.

This ongoing effort can help achieve the Texas Workforce Commission's mission "to promote and support a workforce system that creates value and offers employers, individuals, and communities the opportunity to achieve and sustain economic prosperity."

Background and the Challenge

It may be useful to policymakers, researches, and others to review the phases that preceded the Standards Alignment to Industry Cluster initiative.

Texas has long recognized the critical contribution that literacy makes in the lives of its citizens and especially to the success of entry-level workers in finding jobs that have career potential. The development of Texas Adult Education and Literacy Content Standards 2.0 to guide adult educators and literacy providers is designed to bring consistency and quality to academic and career preparation. The SAIC initiative reflects this long-standing commitment of the Texas Workforce Commission to bring together the education and employer communities in ensuring that the state's education and training programs are meeting the needs of students and employers across the state.

For example, in 2007 The Texas Workforce Commission, recognizing the importance of the Limited English Proficient workforce to the state's economy, produced an **LEP Guide for Workforce Professionals.** The Guide defined literacy as: "An individual's ability to (1) read, write, and speak in English, and (2) compute and solve problems, at levels of proficiency necessary to function on the job, in the family, and in society." The **LEP Guide** was intended to assist Workforce Development Boards in

defining the skill needs of learners in occupationally-specific terms, laying out a series of "scorecard" criteria that included:

- Engaging local businesses in labor market analysis documenting job demand courses in occupational areas that are in the Workforce Board's cluster industries or occupations;
- Designing English language curriculum that is aligned to competencies identified in occupational task analysis; and
- Aligning occupational training curriculum to competencies, skills, and industry requirements and certifications identified in a job task analysis.

Texas Workforce Commission Strategic Plan 2015-2020

More recently, TWC's **Strategic Plan for Adult Education and Literacy 2015-2020** highlights the need to have the employer's voice heard in the development and delivery of services for students.

Among the plan's strategic goals and objectives is the following:

Objective: Increase employer and business community roles in AEL.

> **Tactic 1:** Engage businesses, chambers of commerce, and the Texas Association of Business.
>
> **Tactic 2:** Fund and support with technical assistance work-based projects with employers to support business expansion and build employers as AEL allies.
>
> **Tactic 3:** Engage employers and employer organizations, and expand investments that have proven effective within the 28 Local Workforce Development Boards in efforts **to align AEL levels to occupationally specific skills and work-readiness requirements, including industry-recognized certifications [emphasis added].**

These forerunners to the SAIC initiative contributed to the high quality of discussion that was prevalent among both the educators/workforce development specialists and Industry Cluster subject matter experts during workshops that were held as part of the initiative. The dimensions and nature of the literacy challenge in Texas were subjects of discussion they relate to job-related levels of proficiency, for instance, regardless of educational credential.

Adults without high school diplomas are likely to be important contributors to the Texas workforce, as entry- and intermediate level (including incumbent) employees, for the foreseeable future. Increasing their ability to perform on the job—in tasks that call on knowledge, skills, abilities, and workstyles—should be seen as an opportunity to providers of adult education and literacy services in meeting the needs of the state's employers and serving students.

II. REVIEW OF SAIC ACTIVITIES

The primary activities of the SAIC between June 2017 and June 2018 initiative included:

- Defining a process
- Recruiting industry cluster and educator/workforce development specialist subject matter experts
- Holding team meetings
- Conducting research on entry-level and intermediate-level jobs in the four target industry clusters
- Aligning the standards with work-related information

Defining a Process

The SAIC process steps and the lead SAIC partner for implementation are provided in the table below.

Process Step	Tasks	Lead
1. Identify high-demand jobs	Conduct research using: • TWC Labor Market Information • U.S. Department of Labor's O*NET	Educational Testing Service
2. Collect information from Industry Cluster working groups	• Job descriptions • Proficiency levels of entry-level and intermediate-level jobs • Real-world task examples tied to relevant O*NET elements (e.g., active listening, reading comprehension)	Industry subject matter experts
3. Analyze O*NET and industry working group data	• Find the best match between knowledge, skills, and other relevant occupational requirements for high-demand entry- level and intermediate-level occupations	Educational Testing Service Project staff Industry subject matter experts AEL subject matter experts
4. Create detailed skill descriptions of entry-level and intermediate jobs	• Align the industry information and the results of the O*NET analysis	Project staff
5. Create Standards 2.0 overlays for 3 Content Areas (e.g., English and Language Arts, Mathematics, English as a Second Language)	• Align skill descriptions and the Texas AEL standards and benchmarks	Project staff Validated by subject matter experts

Recruiting Subject Matter Experts

The key to the SAIC project's success was work with its Industry Cluster and Adult Education and Literacy subject matter experts.

Industry Cluster Recruitment. Recruitment of the SAIC project Industry Cluster subject matter experts was accomplished in a variety of ways. Connections with a couple of employer associations and Workforce Development Boards, combined with drafting volunteers who used their network of contacts within their industry, resulted in the engagement of employers and educators. Their names and affiliations are provided in Section V of this document (Key Stakeholders).

Adult Educator and Literacy Provider Recruitment. The Texas Workforce Commission took the lead in recruiting AEL team members. The primary vehicle was an email invitation from Anson Green (State Director, Adult Education and Literacy of the Texas Workforce Commission) to a list of qualified candidates.

Using the research mentioned in the Project Overview section as a starting point, the SAIC partnership brought together groups of these SMEs, starting in October of 2017 to validate the critical skills and to corroborate—through experience and job-specific documentation—the knowledge and skill requirements of entry- and intermediate-level jobs.

Subject Matter Expert Workshops

Industry Cluster SME Workshops

Industry Cluster	Workshop 1 (date and location)	Workshop 2 (date and location)
Construction/Extraction	October 25, 2017 San Antonio	December 8 Virtual meeting
Healthcare Science	October 26, 2017 San Antonio	December 5 Arlington
Transportation/Distribution/Logistics	November 6 Austin	December 7 Virtual meeting
Advanced Manufacturing	December 5 Arlington	January 8 Virtual meeting

There were a number of follow-up meetings that addressed discrete issues related to certification, credentialing, and licensing. In addition, virtual meetings yielded additional input from SMEs on the overlays that were developed prior to sharing data with the AEL SMEs.

Adult Educator and Literacy Provider SME Workshops

Workshops	Date/Location
AEL Team	March 1, 2018 Austin
AEL Sub-group: English Language	Virtual
AEL Sub-group: Mathematics	Virtual
AEL Sub-group: English as a Second Language	Virtual

Industry Cluster and AEL Combined Workshops

The most powerful interactions took place when the AEL and Industry Cluster teams met together.

Workshops	Location
Industry Cluster and AEL Combined Meeting	April 17, 2018 Pearland
Industry Cluster and AEL Sub-group Meeting	May 4, 2018 Austin

RESEARCH

O*NET as Research Basis

As noted in the Project Overview (Section 1), the Educational Testing Service led the SAIC research effort. O*NET was a primary source for job-related analysis supplemented by Texas-specific resources.

The rationale for using O*NET in this work includes the following. The database:

- Provides standardized language around critical components of jobs.
- Serves as a resource for identifying jobs within an industry sector.
- Uses subject matter experts to rate the importance of different characteristics (knowledge, skills, abilities, work styles) for jobs.
- Incorporates labor market information at the state level (employment trends, certifications) and wages at the regional level (Workforce Development Area).
- Allows for comparative analysis of “local wisdom” in Texas WDA plans around wages and targeted occupations.

Texas Employer Data on Employability Skills

The project research included results of contemporary surveys of Texas employers such as the Interlink “Future Trends” surveys of businesses in the Dallas area. This data provided corroboration of data that surfaced from the ETS identification of O*NET “Critical Characteristics” for entry- and intermediate-level jobs as found below when over a thousand employers were asked to identify the “workplace basic skills and attributes” needed by their entry level workforces.

As part of the Interlink research, employer subject matter experts worked in focus groups during Fall 2017 to identify critical skills and attributes. The list below includes those items that 70% or more of the employers identified as critical:

Interlink Survey Results

Skill	%	N = 1020	O*NET Element
Teamwork	91%	929	Cooperation, Adaptability/Flexibility
Work Ethic	88%	902	Dependability, Independence
Following Directions	80%	811	Reading Comprehension, Active Listening
Pride in Work	80%	811	No relevant match
Integrity	77%	788	Integrity
Attention to Detail	76%	780	Attention to Detail
Problem-solving	72%	732	Critical Thinking
Oral Communication	70%	719	Oral Comprehension, Speaking

SAIC Employers Research

SAIC employers identified levels of proficiency for entry- and intermediate-level jobs. To assist in identifying these levels in basic skills for specific entry- and intermediate-level jobs, the employers were provided a document from the U.S. Department of Education's Implementation Guidelines, the Educational Functional Level Table for Adult Basic Education—"Outcome Measures Definitions." Each of these levels highlighted Basic Reading and Writing, Numeracy Skills, and Functional and Workplace Skills. The results of the employer ratings for both Adult Basic Education and English as a Second Language.

They are summarized in the table below.

Report on Levels of Proficiency:

Findings for Entry and Intermediate Level Jobs – Across Sectors

ABE	# of Jobs (Total: 54)	ESL	# of Jobs (Total: 52)
Beginning ABE Literacy	0	Beginning ESL Literacy	3
Beginning Basic Education	14	Low Beginning ESL	6
Low-Intermediate Basic Education	11	High Beginning ESL	15
High-Intermediate Basic Education	19	Low-Intermediate ESL	5
Low Adult Secondary Education	8	High-Intermediate ESL	18
High Adult Secondary Education	2	Advanced ESL	5
Source: Educational Functional Level Table		NRS Implementation Guide	

An advantage of this holistic approach is that it provided employers with a way of seeing basic skills in a workplace (as opposed to academic) context. There is a column in the U.S. Department of Education

document on “Functional and Workplace Skills,” for instance, for both ABE and ESL sections that also includes (along with reading, writing, math and communication) the relative proficiency of computer use needed for each level.

The results of this data collection effort across the industry groups were reviewed by a team of Educational Testing Service experts in literacy and workplace education in preparation for the work of the AEL subject matter experts in February 2018. The intent of this review was to present these data on levels of proficiency in conjunction with the 2016 standards.

AEL Input

As part of the research effort, AEL subject matter experts identified the top skills, abilities, and workstyles for high-demand jobs. O*NET was used as the basis for this activity.

Top 10	Skills/Abilities/Workstyles	O*NET Definition
98%	Dependability	Job requires being reliable, responsible, and dependable, and fulfilling obligations.
88%	Attention to Detail	Job requires being careful about detail and thorough in completing work tasks.
65%	Critical Thinking	Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
65%	Near Vision	The ability to see details at close range (within a few feet of the observer).
63%	Integrity	Job requires being honest and ethical.
65%	Active Listening	Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
60%	Cooperation	Job requires being pleasant with others on the job and displaying a good-natured, cooperative attitude.
55%	Problem Sensitivity	The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.
53%	Oral Comprehension	The ability to listen to and understand information and ideas presented through spoken words and sentences.
48%	Monitoring	Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

Aligning the Standards with Work-related Information

After the research was conducted, a major activity focus was developing the Overlays for each of the 3 content areas:

- English and Language Arts
- Mathematics
- English as a Second Language

The industry representatives reviewed each standard and benchmark to determine whether it was relevant to the target jobs. The consensus was that the majority of the items are relevant.

For each relevant standard and benchmark, the project team identified:

- Relevant O*NET elements (e.g., oral expression, writing, written expression)
- Relevant O*NET Detailed Work Activity. NOTE: In the case of the English as a Second Language section, work activities from the Global Scale of English (GSE) were also used. The GSE is an online resource designed to help educators more easily and accurately assess the progress of students.
- Industry Examples – either from O*NET or from the industry team members.

III. PROJECT GOALS ACHIEVED

By design, the project goals achieved map to the SAIC activities described above

- **Engagement of Industry Cluster and AEL Team Members.** The success of this project depended on the participation of the subject matter experts who volunteered to participate in the project. From the beginning, the active engagement of team members exceeded expectations. Individuals volunteered information, ideas, and many would like to stay involved in implementation after the formal project concludes. Five employers, for example, have participated in webinars and conference panels explaining the importance of SAIC from their industry perspectives.

- **Recognition of O*NET as a Valuable Resource.** Only a few of the industry members had heard of O*NET before the meetings. After multiple meetings, all of which included exposure to O*NET, there was a consensus that the database is the right tool to anchor the SAIC research and that stakeholders could benefit if it were wider known and utilized.

  Almost all of the AEL team members were familiar with O*NET and many were actively using the tool in their work as educators and workforce development specialists.

- **Replicable Process.** An initial question from team members was about the SAIC's focus on the four target industries. These were specified in the Request for Proposal with a rationale that these sectors are important to the Texas economy and had job and career potential for students. The issue was whether an unintended consequence of SAIC would be sending the message that educators and students should focus on these four areas to the exclusion of other sectors that may be a better match for an individual's experience and interests.

  The solution was to ensure there was a process that could be replicated in other sectors. That process is defined in the Activities section (Section II) of this document.

- **Research on High-demand Jobs, Critical Characteristics, and Defining Real-world Industry Examples.** An initial unknown was whether the project would focus on general O*NET knowledge, skills, abilities, and workstyles that could align with the majority of high-demand jobs identified by the research, or whether the approach should be to align with industry- and job-specific examples. After much discussion, the consensus among the project team and subject matter experts was to focus on specific examples. The research and alignment that are the core of standards 2.0 is the result.

  An example of the results of the ETS's O*NET research (below) shows how the key skills and abilities, are associated with critical work tasks. The Industry Cluster SME's were asked to use task activities such as these to provide examples of how skills were applied on the job. It is from these examples that the project staff began to build the cross-walk between the Standards and the skills needed in entry- and intermediate level jobs. As can be seen in the table below, communication skills—active listening, oral expression and comprehension—play an important role across the four industry sectors.

Correlation of Skills & Abilities with Tasks Across 4 Industry Sectors

		TASKS					
		Communicating with Persons Outside Organization	Communicating with Supervisors, Peers, or Subordinates	Establishing & Maintaining Interpersonal Relationships	Making Decisions and Solving Problems	Organizing, Planning, and Prioritizing Work	Scheduling Work and Activities
SKILLS/ ABILITIES	(S) Active Listening	X	X	X	X	X	X
	(S) Critical Thinking	X	X		X	X	X
	(S) Reading Comprehension	X	X	X	X		X
	(S) Speaking	X	X	X			X
	(A) Oral Expression	X	X	X	X	X	X
	(A) Oral Comprehension	X	X	X			X
	(A) Written Expression	X	X		X	X	X
	(A) Written Comprehension	X	X	X	X	X	X

IV. OBSTACLES

There were no obstacles that fully obstructed progress or achievement or the SAIC goals. There were challenges, however, which are summarized below.

Challenge: Recruitment of Industry Subject Matter Experts

An early challenge was recruiting employers to participate as subject matter experts for the project. There were recruitment challenges given demands on employers' time and commitments due to the low unemployment rate and the resulting difficulty in finding qualified candidates.

- **Resolution:** As noted earlier, the project team worked though networks to identify employers with an interest in participating in the SAIC initiative. Anson Green (State Director, Adult Education and Literacy of the Texas Workforce Commission) also emailed and called individuals with industry contacts. The result was an adequate number of engaged employers dedicated to each of the target sectors.

Challenge: Common Mission

A question that came up in early meetings of both the industry representatives and the educators was, "what is the mission of the SAIC in terms that we can relate to?" It was apparent that investing time to answer this question would be important to ensuring the subject matter experts had a stake in the role they were to play in the project.

- **Resolution:** The working groups invested time to define the SAIC mission for their respective roles. As another example of engagement, early on in the process the industry representatives developed mission and vision statements, which are provided below.

Industry Cluster Vision & Mission Statements

Vision: Business and industry will increase opportunity for all Texans to contribute to their own success and to the state's growth and prosperity.

The result will drive the economic value of human capital for the state of Texas.

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Mission: Working with adult education and literacy partners, employers will deploy, measure and promote strategies that define how the mastery of critical skills (standards aligned with real-world job competencies) enables Texas workers to gain access to high-demand jobs that have career potential.

Several members volunteered to post these on social media along with pictures of team meetings.

Adult Educators and Literacy Provider Mission

The mission and purpose of the SAIC initiative is to provide areas of focus and contextualization for educators, workforce development specialists, and others who work with students to prepare them for additional education and career.

Challenge: Limited Real-world Content in 2016 Standards

As the employers studied the individual standards and benchmarks, they concluded that some were more relevant to the world of work than others. The employers did not identify a real-world item, for example, where "Quadratic Equations and Functions" (Mathematics, Subarea II.6, A, page 30) is used in entry-level or intermediate-level jobs. In contrast, the Pythagorean Theorem (Mathematics, Subarea II. 3, B. page 27) is used in construction jobs when angles come into play.

There were other content areas – e.g., critical thinking, problem solving, teamwork, communication – that employers believed were under-represented in the standards.

- **Resolution:** Standards that the employers determined are not relevant to high-demand entry-level and intermediate-level jobs are described as relevant for academic and potentially higher-level occupations. These standards are not aligned with O*NET and real-world examples. Standards that are relevant are aligned with O*NET elements (e.g., Active Listening, Critical Thinking), Detailed Work Activities, and the real-world examples.

Challenge: Technology Under-represented in the 2016 Standards

Another area that employers and educators determined is under-represented in the 2016 standards is technology which is relevant for most jobs today and is likely to be more so in the future.

- **Resolution:** A sub-group of educators working on the Mathematics standards identified the International Society for Technology and Education (ISTE), a group which has developed a set of technology-related standards as "a framework for students, educators, administrators, coaches, and computer science educators to rethink education and create innovative learning environments." A consensus of the subject matter experts was to recommend the ISTE standards as a best-practice approach to help integrate work-relevant technology into adult

V. KEY STAKEHOLDERS

The tables below provide the names and affiliations of the Subject Matter Expert Working Groups, Informal Advisors, Texas Workforce Commission Staff, and Project Staff.

WORKING GROUPS

Industry Cluster Team Members

Cluster	Member	Affiliation
Advanced Manufacturing	JR Gambill	Klein Tools
	Frank Green	Bell Helicopter
	Sarah Haskins	Mother Parkers Tea & Coffee
	Candy Slocum	InterLink
	Pat Tarver	APICS San Antonio
	Keith Bell	Intex Electrical Contractors, Inc.
Construction & Extraction	Scott Bland	Jim Bland Construction
	Jane B. Hanna	Construction Education Foundation
	Jay Jones	Lincoln Electric
	David Lindsay *	LyondellBasell (retired)
	Todd McAlister	Texas Air Conditioning Contractors Assoc.
	Mike Sandroussi	Craft Training Center of the Coastal Bend
	Natalie Smith	KBR
Healthcare Science	Kathryn Biediger	University Health System
	Jacque Burandt	Award-winning Results
	Gerard Camacho	Parkland Health & Hospital System
	Valerie Esparza	Seton Healthcare Family
	Seleria Fletcher	Memorial Hermann Health System
	Daniel Gandarilla	Texas Health Resources
	Beena Joseph	Memorial Hermann Health System
	Lee Webster	Healthcare Management Institute – UTMB
Transportation, Logistics, Distribution	Jim Bloess	Phillips Distribution
	Ronnie Brannon	Palo Alto College
	Diana Contreras	Dollar General
	Pat Tarver	APICS San Antonio
	Joseph Zambrano	Seasonal Living

***** David Lindsay also served as a Special Advisor to the SAIC Initiative. He is affiliated with the National Center for Construction Education and Research (NCCER), a primary SAIC partner.

Adult Education and Literacy Provider Team Members

Name	Title	Affiliation
Ashley Trevino	Director of Adult Education	Grayson College
Glenda L. Rose	Program Manager for PD Needs Assessment and Evaluation	Train PD @ TCALL, Texas A&M University
Cheryl Smith	Career Navigator, Assistant Director, and IET CMA Instructor	Howard College - Concho Valley
Mechelle Marler	Career Pathways Supervisor, Adult Education Division	Austin Community College
Elizabeth "Liz" Moya	Instructional Specialist; PD coordinator	Ysleta Community Learning Center; FWAEC
Delia Watley	Program Director	Irving ISD - Dallas County Consortium
Beth Ponder	Program Manager for PD field services	Train PD @ TCALL, Texas A&M University
Annemarie Molinari-Sanders	Professional Development Center Content Specialist	Train PD @ TCALL, Texas A&M University
Karen Condit	Academic Facilitator/ Instructional Coach	North East ISD Adult Education/ Region 20 Consortium
Debbie Janysek	Instructional Coach/ Lead Instructor/ Professional Development Coordinator	Victoria College Adult Education
Kelli Rhodes	Executive Director	Restore Education
Denise Johnson	Professional Development Coordinator	Harris County Department of Education
David Garza		

INFORMAL ADVISORS

Name	Title	Affiliation
Jeff Holcomb	Former CEO and President	Altus Traffic
Jeff Hall	Workflow Advisor	Chevron

TEXAS WORKFORCE COMMISSION STAFF

Name	Title	Affiliation
Anson Green	State Director, Adult Education and Literacy	Texas Workforce Commission
John Stevenson	Program Specialist	Texas Workforce Commission

PROJECT STAFF

Name	Title	Affiliation
Jennifer Edwards	Chief Executive Officer	Literacy Texas
Federico Salas-Isnardi	Acting Chief Executive Officer	Literacy Texas
Dale Pillow	Board of Directors	Literacy Texas
Bridgett Krienke	Community Coordinator	Literacy Texas
Sasha Khalifeh	Program Manager	Literacy Texas
Dan Hawthorne, Ph.D.	Director of Industrial/Organizational Solutions	Educational Testing Service
Maria Elena (Malena) Oliveri, Ph.D.	Research Scientists	Educational Testing Service
David Lindsay	Retired	LyondellBasell
Karl Haigler	President	Haigler Enterprises International, Inc.
Rae Nelson	Associate	Haigler Enterprises International, Inc

VI. POSITIVE OUTCOMES

Positive outcomes from the SAIC are provided below.

- **Linking Standards with Real-world Work Examples.** The SAIC Initiative provides a bridge to the gap between academic standards and "real world" demands for workplace performance. This is the key to contextualization, which will be a strategy for educators to help communicates Standards 2.0 in a meaningful way for students.

- **Contextualization Resources.** Through the SAIC, resources were identified that that can help educators and workforce development specialists facilitate more contextual instruction in the classroom. These include O*NET, the Global Scale of English, NCCER publications, the International Society for Technology and Education technology standards, and the Contextualization Toolkit for Instructors. NOTE: More about these resources is provided in the next section.

- **Research-based Model.** The SAIC project resulted in a research-based model (using O*NET, GSE, and ISTE) for use by educators and workforce development specialists.

  For example, from O*NET, ETS research scientists used the work activities questionnaire that describes the underlying behavioral components of tasks ranging from more general (i.e., General Work Activities) to more specific (i.e., Detailed Work Activities) descriptors of performance across occupations. The creation of the descriptors was meant to be general enough to allow for cross-occupational matching and specific enough to differentiate across jobs. The SAIC team used descriptors from the DWAs, which are viewed as offering the greatest potential for use as a common language or bridge among employer hiring needs, the capabilities of displaced workers or new labor force entrants.

- **Disseminating Research.** A core outcome of the project was Introducing occupational research (e.g., O*NET findings from the Educational Testing Service) both employers and educators.

- **Employer-Educator Connections.** A positive outcome of the project was the collaboration among educators and employers in developing Standards 2.0. This resulted in a greater appreciation of respective roles and resources, and built a common purpose in helping students succeed in further education and at work. This included greater appreciation the roles of certification, credentialing, and licensure can serve in career progression for students.

- **Value of Certification, Credentialing, and Licensing. Certification, Credentials, Licensing**

  The topic of career progression throughout the SAIC project involved the value of additional education and training courses related to certification in specific career fields. Based on the discussions and surveys of the Industry Cluster members, the Construction industry and Healthcare fields were the areas where certification played the most prominent, clearly articulated roles. The Workforce and Innovation Opportunities Act (WIOA) Guidelines below

provide guidance in showing that in some cases (as in Construction careers) the goal of certification programs may be the award of a license in a specific trade.

Credentials, Certificates, Certifications, and Licenses: WIOA Guidelines Revisions, TWC, July 2018

- **Credential** is an all-encompassing term used to describe any type of traditional or non-traditional award within the context of education, training, workforce, and employment development. Credentials are awarded by third-party entities that have relevant authority to issue such credentials after individuals demonstrate proficiency or competency in a given occupation or field. Credentials can be earned from a variety of sources, including, but not limited to, educational institutions, industry associations, and government agencies.

- **Certificates** are awarded by independent education and training providers associated with specific programs of study, or educational institutions, such as universities, as a result of education focused on one topic (but separate from a degree program). Course content is developed by faculty committees, academic leaders, and instructors, or occasionally through defensible analysis of the topic area—that is, course content and subject matter that can be justified, through testing that leads to certification, and is taught by an instructor for a particular purpose or benefit to an individual. Certificate programs are generally created, taught, and assessed directly by the provider of a program. **A certificate demonstrates an understanding of course content at a specific period in time, demonstrates proficiency through provider-administered exams, and is often listed on a résumé as evidence of knowledge for prospective employers. While obtaining a certificate generally signifies the end of the instructional program, earning a certificate may also provide a gateway for achieving a degree.**

- **Certification** is a type of non-traditional award to an individual that demonstrates proficiency and knowledge, through examination, in a specific industry or trade. Obtaining a certification award is not dependent on any actual education or training program. Instead, evaluating candidates for certification relies on independent, third-party professional and industry-based groups. These national organizations develop and maintain relevant proficiency standards that are assessed and sanctioned by industry-approved examinations facilities, independent of any educational institution or training program. Certifications often have an expiration date, requiring individuals to participate in continuing education or reexamination to stay current. Additionally, certifications are not associated in any way with higher education or degrees and typically require that the potential recipient have some level of professional experience before beginning the process.

- **License** is a type of non-traditional credential that is generally awarded by a government-regulated agency. Licenses are granted by federal or state government, but usually by state government, and they are mandatory for professional practice in their jurisdiction. A license is more heavily regulated and restrictive due to its governmental association, and it signals that an individual has completed or achieved certain standards. Licenses are often required for health, public education, legal and financial careers. Some examples of occupations that require an individual to have a valid license include plumbers, electricians, real estate brokers, and nurses.

Licensing was also mentioned prominently in the case of the Transportation, Distribution, and Logistics sector in the case of truck drivers, an occupation in high demand across the state. Here licensing (the award of a Commercial Driver's License) plays a prominent role in programs, both public and private, that support students who may not have a high school diploma in acquiring the skills necessary to operate tractor-trailers safely and efficiently.

TWC surveys provide examples of how AEL programs across the state are supporting industry-specific certificate and licensing programs. These include Integrated Education and Training (IET) programs in which students receive up to 96 hours of basic skills instruction in the following career fields:

- Healthcare: Certified Nursing Assistant; Medical Assistant; Medical Records/Billing Clerk
- Advanced Manufacturing: Auto CAD and Drafting Technician
- Construction/Extraction: Millwright; Welder; HVAC Technician
- Transportation Distribution Logistics: Truck Driver's Commercial Drivers' License Preparation

VII. BEST PRACTICES

The item below are best practices that occurred as a result of SAIC implementation or were used in the SAIC process.

Preparing Students for Further Education and Careers. A primary goal of the SAIC initiative is stakeholders' understanding that a best practice is to prepare students for further education and career options. This creates a "win-win-win" outcome for students, employers, and the economy.

Employer and Educator Interactions and Partnerships. During the SAIC project, the interactions among industry representatives and educators/workforce development specialist benefited both parties through deepening the understanding of their respective goals, capabilities, and needs. The result is an increased likelihood of helping students achieve the knowledge and skills needed for success in jobs and careers.

Contextualization. A best practice in adult learning which is important for SAIC implementation is ensuring that students understand the relevance of learning content to their professional and personal lives. Standards 2.0 is designed to help educators communicate standards and benchmarks in meaningful and real contexts for students.

Proficiency and Credentials. There was a consensus among SAIC subject matter experts, particularly employers, that focusing on students' proficiency can be a better predictor of success on the job that strictly requiring a credential. Focusing on proficiency is seen as a way to screen people in, rather than screen people out, of professional opportunities.

Open Source Online Repository and Forum. "We don't want to reinvent the wheel." This was a sentiment among educators and workforce development specialists as they exchanged examples of curricula, exercises, and other materials they have developed. It was noted that there are part-time educators, for example, who could best invest their time working with students as opposed to developing materials that may already exist.

For the SAIC project, the Texas Center for the Advancement of Literacy and Learning at Texas A&M University set up folders in the online Communities of Practice. Literacy Texas also offers online materials for educators. For the SAIC initiative implementation, it may be valuable to identify appropriate online open source models and actively encourage stakeholders to share materials. Two examples of model are from Minnesota:

- Minnesota Literacy Council – Educators' Resources Page: https://mnliteracy.org/educators
- ACES Resources: Tools to help Adult Basic Education practitioners integrate the Transitions Integration Framework (TIF) skills into lessons, including materials that can be used directly with their learners: http://atlasabe.org/resources/aces

Resources. During the course of the SAIC project, several resources were used and discovered that may serve as best practice assets for others. These include:

O*NET. As referenced earlier, the O*NET database is a best practice research tool for workforce development. It includes an interest inventory and career navigation tool, My Next Move, which can be used by educators and workforce development specialists working with students

on job and career options. The databased and My Next Move are available in Spanish. There also is a My Next Move for veterans.

Global Scale of English. This online resource is designed to help educators more easily and accurately assess the progress of students. As a free resource, it offers a GSE Teacher Toolkit that contains a searchable database of:

- more than 2,000 learning objectives
- more than 450 grammar objectives
- 39,000 vocabulary items
- more than 200 jobs linked to learning objectives (NOTE: These map to jobs in the O*NET databased)

Educators can use the GSE toolkit to Develop rubrics across job families within an industry or across sectors to identify
"transferable skills"

- Solicit examples of how skills are applied in a variety of workplaces
- Develop contextualized assessment and instructional approaches geared to local workforce development needs—for high-demand and "target" jobs

National Center for Construction, Education and Research (NCCER) Publications. NCCER, a SAIC partner, has developed dozens of curricula to prepare students trades in the construction industry. All of these are resources for educators preparing students for jobs and careers in this sector. Another resource, **Tools for Success**, is a text for teaching soft skills for construction students. Much of the content is applicable for other sectors. The AEL subject matter experts identified this as a good resource for educators, workforce development specialists, and students.

Contextualization: Creating Career-Infused Classrooms – A Toolkit for Instructors. The toolkit was prepared by Lennox McLendon, Ed.D. This can be used by educators to integrate standards 2.0 into instruction that better prepared students for the workplace.

VIII. AREAS FOR IMPROVEMENT

The Project Staff identified the general areas for improvement provided below.

Target Audiences. The question about target audiences was raised in early meetings. In addition to educators and workforce development specialists, audiences could include others who work with students – vocational rehabilitator, job trainers, guidance counselors, and others.

An area for improvement may have been to define all the potential audiences and determine if there are ways to ensure materials are inclusive in their content and presentation. This may also be an area for the implementation phase.

Early Input from AEL Members on Employer Partnership Experience. Once the AEL team members were identified in early 2018, the Project Staff might have surveyed them on experiences they may have had working with employers to serve students. This information might have jump-started the educator-employer connection earlier than waiting until the April 17 workshop to build these connections.

Communicating SAIC Value to Employers. As noted earlier, recruiting employers to participate in the SAIC project was an early issue. The employers who did participate were engaged and valuable resources. If the Project Staff were able to communicate in more concrete terms how SAIC would be able to provide a return on investment of time for employers, recruitment may have been easier. Another approach would have been communicating how SAIC tied to a bigger picture regarding the economy, rather than being another siloed project.

Measuring Success. Another early topic, particularly in employer discussions, was how success of the SAIC initiative was to be determined. Aside from traditional evaluation methods, it may be an advantage to articulate success, and monitor progress toward that articulation, in terms that are meaningful to employers and other stakeholders.

IX. COMMUNICATION, DISSEMINATION, REPLICATION

Communication and Dissemination. "Please don't let this be a report that sits on a shelf." As mentioned earlier, this was a common refrain from workgroup members. It may be worthwhile to invest time in developing a comprehensive communications plan (e.g., goals, audience, strategies, messages, channels, outcomes).

- **Building Awareness**. The first step in ensuring an initiative achieves its potential is to build awareness. To help achieve this objective for the SAIC project, the grant was extended from its original end date of June 30 to August 30. Literacy Texas collaborated with TCALL to share the findings of the project virtually with a broad audience of adult educators and literacy providers across the state. Literacy Texas took the lead in recruiting and inviting participants. Haigler Enterprises coordinated with Literacy Texas on developing the webinar content. TCALL staff produced the webinars. The TCALL PD portal was used as the platform for the delivery of the webinars.

  The webinar topics and dates are listed below:

  SAIC Webinar 1 (Introduction to SAIC Project**)**, June 26: 38 participants
  SAIC Webinar 1 (Introduction to SAIC Project), June 27: 26 participants
  SAIC Webinar 2 (ONET), July 17: 73 participants
  SAIC Webinar 3 (The Employer Perspective), July 19: 73 participants

  Total participants for all four webinars: 210

- **Conferences.** Conference presentations are an obvious communications vehicle for the SAIC. Presentations to date include:

  - Literacy Texas Regional Symposium, Waco, May 7, 2018.
    - O*NET Workshop
    - SAIC Overview Lunch Keynote
  - Literacy Texas Annual Report, Waco, August 7, 2018
    - SAIC Overview Workshop
    - The Employers' Perspective, Panel General Session

  There have been recommendations from project staff and team members for additional conferences in 2018 and 2019.

- **White Paper**. A white paper on the SAIC initiative was developed for the Association on Training and Development.

- **Open Source Online Site for Resources**. As mentioned in the Best Practices section of this document, an open source site might be a useful communications tool for SAIC practitioners.

Replication. An option is for other industry sectors to replicate the SAIC model using the process outlined in this document in the Activities Accomplished section.

APPENDIX

This appendix provides additional information on the research conducted by the Educational Testing Service.

We used descriptors from the DWAs, which are viewed as offering the greatest potential for use as a common language or bridge among employer hiring needs, the capabilities of displaced workers or new labor force entrants, and the program and course offerings available through the public education system (Tippins & Hilton, 2010).

Research Process for Targeting "High-Demand" Jobs: Dan Hawthorne, Ph.D., ETS

This phase of work for the SAIC initiative was based on two main goals,

1. identify the current high potential jobs in Texas in 4 major industry clusters—Construction/Extraction, Healthcare, Advanced Manufacturing, and Distribution Transportation Logistics—and
2. identify the critical skills within and across those industry clusters to identify the critical skills that workers would need to possess.

Use of O*NET. An important element of this work would be the use of a framework that provided transportable information and linked to the development of a crosswalk between the critical job characteristics and the Texas Adult Education & Literacy Content Standards.

O*NET was chosen as a framework for this project because of its high-degree of applicability to the goals and its deep connection to Bureau of Labor Statistics (BLS) data at both a national-level and a state-level. Additionally, O*NET classifies all jobs by industries similarly grouped in previous work by the Texas Workforce Commission and uses an industry-accepted classification of work characteristics (knowledge, skills, abilities, workstyles, etc.) that provided a good foundation to link O*NET classifications to those found in the Texas Content Standards documents.

O*NET Job Zones

Additional criteria was that the jobs to be the focus of this work were those most accessible to the majority of the population for entry- and intermediate-level employment. Using O*NET as a framework, we focused on the jobs from Zones 1-3. These three job zones are broadly characterized as follows:

- **Job Zone One (Little or no preparation needed)** – Some of these occupations might require a high school diploma or high-school equivalency certificate, but many will not. They also require little to no experience or related skills and may require a few days to a few months of training time.

- **Job Zone Two (Some preparation needed)** – These occupations will generally require a high school diploma or high school equivalency certificate. Additionally, they will usually require some previous work-related knowledge and skills or experience. They may also require training that will last from a few months to one year.

- **Job Zone Three (Medium preparation needed)** – Most of the occupations in this zone require some post-secondary training, such as vocational schools, associate's degrees, or related on-the-job experience. They almost always require some degree of work-related skill, knowledge, or experience

and the training for these jobs will require between one and two years of on-the-job training or information training with those experienced in the occupation.

Identification of High Potential Growth Jobs in 4 Industry Clusters

As stated previously a major goal of this work was to identify the high-potential growth jobs in 4 key industry sectors. To identify these occupations, several sources of information were. Initially, we used O*NET to sort by the specific industries available in O*NET.

SAIC Industry Sector	O*NET Industry Sector
Advanced Manufacturing	Manufacturing
Construction & Extraction	Construction Mining, Quarrying, and Oil and Gas Extraction
Healthcare Sciences	Healthcare and Social Assistance
Transportation, Distribution, Logistics	Transportation and Warehousing

Once tables of occupations were compiled, they were filtered for job zone data as mentioned above, so that only job zones 1-3 were represented. ETS researchers used the Career One Stop database that is directly associated with O*NET to pull state-level data for each occupation listed in the data tables representing the industries of focus (Job zones 1-3) and added variables representing "Predicted 10-year Percent Change in Employment" and "Predicted Annual Job Openings." These two variables matched the data used in the national-level O*NET data to classify "Bright Outlook" jobs. Thus, having a measure of growth in terms of longitudinal change and predicted growth trends made logical sense to replicate in our data. To classify high potential growth jobs in our data set, ETS applied the following filtering rules:

- "Predicted 10-year Percent Change in Employment" – We looked for predicted 10-year growth of =/> 15%. In the national O*NET data Bright Outlook jobs were classified as being those experiencing greater than 10% growth. We chose to increase the cut point to 15% to account for regression to the mean in the national level data. This decision was made based upon expert opinion to maintain the spirit of this measure and capitalize on useful data in the dataset.

- "Predicted Annual Job Openings" – We created a filter cut point using this variable of =/> 2000 predicted annual job openings. National-level O*Net data uses a cut point of 100,000 job openings to denote Bright Outlook jobs. So, an initial cut that was simply 100,000 /50 states in the US = 2000, provided a point to check against the existing jobs in Texas. Initial estimates showed that this gave a good sample of jobs to work from.

With these filters applied to our data by each industry cluster, ETS identified the high-demand jobs, specific to Texas.

Classification of Critical Characteristics within and Across Job Clusters

Once ETS researchers identified the high-growth potential jobs in Texas, they needed to identify the critical work characteristics that were common across each industry cluster. Five work attributes were the primary focus of analyses. The O*NET links provides specific elements associated with the attributes.

- Knowledges https://www.onetonline.org/find/descriptor/browse/Knowledge/)
- Skills (https://www.onetonline.org/find/descriptor/browse/Skills/)
- Abilities (https://www.onetonline.org/find/descriptor/browse/Abilities/)
- Work Activities (https://www.onetonline.org/find/descriptor/browse/Work_Activities/)
- Work Styles (https://www.onetonline.org/find/descriptor/browse/Work_Styles/)

These attributes were chosen because of their high level of alignment with the standards. In order to focus on only the most important AND common attributes across all of the jobs, ETS created two ways to look at the O*NET attributes and address both "importance" and "commonality" across industry groups.

1. IMPORTANCE. Across the characteristics, we calculated a mean for each attribute. A higher mean represented a higher level of importance across all jobs in the industry cluster. However, depending on the spread of scores across all jobs, this mean might be leveraged by a wide spread of scores that would fall below an "important" cut score.

2. COMMONALITY. The standard deviation of each attribute was calculated. A lower standard deviation among scores indicated that there was more commonality among the mean scores, or to put it more simply the scores were clustered more tightly around a common mean. Thus, if an attribute had a high mean and a low standard deviation, it could be assumed that the attribute in question was of importance to the majority of the jobs in the industry cluster.

Each attribute Importance rating is a Likert-scale that ranges from 1 to 5. Higher scores indicate more importance to a job (https://www.onetonline.org/help/online/scales). A standard point at which an attribute can be considered to be "important" is 3.0. This was chosen as the initial cut-score for a potentially important score. For most of the attributes, a Standard Deviation cut-score was set to .50, meaning that the majority of the attribute's importance scores are within .5 units of the mean. For example, if a mean score on an attribute is 3 and the standard deviation is .5, then the majority of all of the attributes importance scores are between 2.5 and 3.5. We chose .5 to develop a level of restriction that would keep scores of 3.0 within rounding error of being within the "important" range.

NOTE: One attribute, Work Styles, was handled slightly differently. Instead of the .5 standard deviation cut score, we applied a .3 cut score. This decision was made because there is a tendency for Work Styles to be rated uniformly important across most jobs. Applying the same .5 cut would have resulted in far too many attributes to be useful to the project. Therefore, a slightly stricter .3 cut was applied to reduce the number of attributes that would be flagged across the industry clusters.

The result was that, for each attribute, two dummy-coded flags were created to represent the mean and standard deviation thresholds. If an attribute triggered both flags, then it was tagged as being important across an industry cluster. With this process of analysis completed, tables showing the most important work attributes across industry clusters were developed for the next phase of the project.

After consultation with industry subject matter experts, we received feedback that there may be one table—Manufacturing—that had some attributes missing that they considered to be important across the industries. We reexamined the data tables associated with this industry cluster and found that the identified attributes were above the mean of 3.00, but were very close to the threshold of .5 that we had set. We reset the threshold on this industry cluster to a standard deviation of .52 and the following other work attributes (which included those the SMEs had identified) were indicated with both importance flags:

- English Language (Knowledge)
- Coordinating the work activities of others (Work Activities)
- Processing information (Work Activities)
- Updating and using relevant knowledge (Work Activities)

When these were presented to SMEs, they agreed that these attributes should also be included in the Manufacturing industry cluster for the next phase of the project.