

Communication Improvement for Machining Technology Needs Assessment

According to the Occupational Outlook Handbook, published by the U.S. Department of Labor, Bureau of Labor Statistics, minorities and immigrants will constitute a larger share of the U.S. population in 2015 than they do today. Substantial inflows of migrants and refugees, both documented and undocumented, from every corner of the world have significant implications for the labor force because immigrants tend to be of working age but of different educational and occupational backgrounds than the U.S. population as a whole. Enrollments in adult basic education programs (which include ESL) are increasing because of changes in immigration policy that require basic competency in English and civics, and an increased awareness of the difficulty in finding a good job without basic academic skills.

From 2000 to 2025, Texas population is expected to increase by 8.7 million –a 41.7 percent increase. In addition to its sheer growth, Texas population is experiencing other fundamental changes. The state's Hispanic population is expected to increase from 33 percent of the current total population to 44.9 percent by 2025. Together, Hispanics and Blacks are projected to account for more than 55.4 percent (16.4 million) of Texas population by 2025, with Anglos accounting for 39.8 percent (11.8 million). **Source:** Strategic Plan for Texas Community Colleges 2005-2209, Texas Higher Education Coordinating Board, Division of Community and Technical Colleges Austin, Texas, 2004.

Houston is, and has been a port of entry for immigrants from all over the world. As the largest city in the state, and the fourth largest city in the country, Houston has provided a haven to those seeking a new home, for political, social, and/or economic reasons. The majority of these recent immigrants are Limited English Proficient (LEP) and their functioning in and contribution to the overall community and their own families is limited by this fact. Census data, immigration data, local education agency data, and provider demand data all indicate that the number of functionally illiterate Houstonians is growing at an alarming rate. About fifteen percent of adults over 18 years of age lack eighth grade attainment; more than eighteen percent of adults have attended school between ninth and twelfth grade without a high school credential. A census estimate of families in which the home language is other than English indicates that English fluency needs persist. This is also indicated by the rapid growth of the Hispanic and Asian communities (60% and 96%, respectively) and their percentage of the total population within the service area (28% and 4%, respectively). The latter is confirmed by Houston Independent School District data on the number of children experiencing similar needs in school.

Traditionally, limited English proficient (LEP) adults have been excluded from job training programs until they attained proficiency in English. However, experience has show LEP students can complete job training just as successfully and in the same amount of time as their English-speaking peers when a Workforce English as a Second Language (WESL) program is in place. The instructional goal of this model is to prepare adults with the necessary English language skills, basic skills, job skills, and workplace skills required to find immediate success in the job market. The WESL program we are proposing is *Communication Improvement for Machining Technology*. It is designed for participants who have the ability and desire to obtain an entry-level machinist position, but are deficient in English language and basic occupational skills. **Source:** TEXAS WORKFORCE COMMISSION Career Schools and Veterans Education Information Document for Workforce English as a Second Language (WESL) [Ref. Title 40, Texas Administrative Code (TAC),§807.93]

The Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2006-07*, reports that despite relatively slow employment growth, job opportunities for machinists should continue to be good. Many young people with the necessary educational and personal qualifications needed to obtain machining skills often prefer to attend college or may not wish to enter production occupations. Therefore, the number of workers obtaining the skills and knowledge necessary to fill machinist jobs is expected to be less than the number of job openings

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arising each year from the need to replace experienced machinists who transfer to other occupations or retire, and from job growth.

Employment of machinists is projected to grow 6% for all occupations over the 2004-14. Machinists will become more efficient as a result of the expanded use of and improvements in technologies such as CNC machine tools, autoloaders, and high-speed machining. This allows fewer machinists to accomplish the same amount of work previously performed by more workers. Technology is not expected to affect the employment of machinists as significantly as that of most other production occupations, however, because machinists monitor and maintain many automated systems. Due to modern production techniques, employers prefer workers, such as machinists, who have a wide range of skills and are capable of performing almost any task in a machine shop.

United States	Employment		Percent Change	Job Openings ¹
	2002	2012		
Machinists	386,800	418,700	+ 8 %	12,200
Texas	Employment		Percent Change	Job Openings ¹
	2002	2012		
Machinists	25,550	27,050	+ 6 %	750

¹Job Openings refers to the average annual job openings due to growth and net replacement.

Language skills are essential for this population to advance in their careers. This project targets a growing workforce, not only in the Gulf Coast region but throughout Texas. In addition, materials for this occupation can be adapted for use in other metal and plastic occupations such as foundry worker, computer-control programmers and operators, tool programmers, metal platers, tool and die makers, tool designers, and tool grinders.

The curriculum developer performed a Performance Criteria Analysis [PCAL] for machining technology with eight local employers and employees; collected documents, such as forms, work orders, labels, manuals, job descriptions, safety information, and training materials; collected ancillary written materials, such as benefits packages, employee manuals, policy manuals; and consulted machining training standards from the National Institute for Metalworking Skills as well as the Texas Standardized Curriculum Framework Workforce/Workplace Standards. This analysis provided:

- the main components or duties of the job
- the language and literacy tasks that comprise each of the job components, the language skills (i.e. listening, speaking, reading, writing) and cultural information
- the kinds of interactions with coworkers required
- the nature of social interactions during the work day
- the safety issues related to language and literacy skills
- cross-cultural information to be addressed

Once the analysis was completed, the curriculum developer analyzed the language and literacy needs that had been identified and the performance objectives, derived from competencies identified through the language and literacy task analyses, were set. These objectives related to one or more of the following:

- performance of actual tasks
- language and literacy of the job and the workplace
- general oral and written English language structures

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After the goals and performance objectives had been established, the language and literacy competencies and vocabulary that needed to be taught to meet those objectives were determined. Under each task, a need was determined for:

- **Language functions:** different types of oral language used for a specific communicative purpose (e.g. listening to directions, understanding and asking for clarification)
- **Literacy tasks:** tasks involving reading, writing and other cognitive skills in relation to printed material for both communications (e.g., filling out an order form) and for gaining and processing information (e.g., scanning a price or size chart)
- **Vocabulary:** technical, idiomatic, or general.

The curriculum was then developed by taking job content information and competencies from language and literacy task analyses, and incorporating them with other workplace and general language and literacy competencies relating to limited English-proficient workers' needs. From these competencies, learner outcomes were created and content materials were chosen from the textbook, *Technology of Machine Tools*, Steve F. Karr, et al, McGraw Hill, 2005. This is the textbook students are using in their Machinist I Certificate. These content materials were then organized and sequenced by topic themes and were published as the *Communication Improvement for Machining Technology Student Manual*, delivered via particular teaching methods as outlined in the *Communication Improvement for Machining Technology Teacher Resource Manual*.

The *Communication Improvement for Machining Technology* program is designed to teach participants how to communicate and function effectively in the world of work. It teaches learners the language skills needed on the job, while also exploring safety issues relevant to the workplace. The program is organized around three areas: (1) competencies - what learners need to be able to do with English in real-life situations, (2) functions - how people use language: to ask and answer situation-specific questions, to state opinions, to agree and disagree, to make suggestions, to ask for clarification, etc., and (3) SCANS foundation skills and competencies.

Special activity types integrating **SCANS** are used to help students develop skills that are valued highly by employers. These include problem-solving and decision-making, gathering information, categorizing, and sequencing.

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