



Dental Laboratory Technician – Job Classification Dilemma

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Introduction

In the last decade, dental laboratory technology profession experienced a transformation resulting from the digitization, introduction of new business models and changes in regulatory standards (i.e., laboratory registration, materials origin, and content disclosure, licensing, zoning, taxation, other changes in state dental practice acts, tariffs, HIPAA laws, FDA, OSHA, and CDC regulations). Consequently, dental technicians had to become more conversant and experienced in fundamentals, latest materials, equipment, techniques, regulations, as well as in the new healthcare and business models to fulfill growing needs of operating a successful dental laboratory. However, according to the Bureau of Labor Statistics (BLS) and Occupational Information Network (O*NET), the minimum entry requirement for this highly skilled profession remains a high school diploma or its equivalent.

This poster examines the background, scope and relationship of Bureau of Labor Statistics (BLS) and Dictionary of Occupational Titles (DOT) & O*NET classifications for the dental laboratory technology profession including the evolution of job categories, as well as the advantages, disadvantages, and consequences of altering job classifications.

Bureau of Labor Statistics (BLS) - History

In the U. S. the government entity overseeing occupational classifications is the Bureau of Labor Statistics (BLS):

- Created in 1884 when Congress founded a Bureau of Labor in the Department of Interior
- Later changed to the Bureau of Labor Statistics (BLS)
- In 1888, BLS became an independent department and continued for 15 years
- In 1903, BLS was incorporated into the Department of Commerce and Labor
- In 1913, BLS was reassigned to Department of Labor (DOL) where it remains to this day.⁸

BLS & Job Classifications

BLS developed Standard Occupational Classification (SOC)

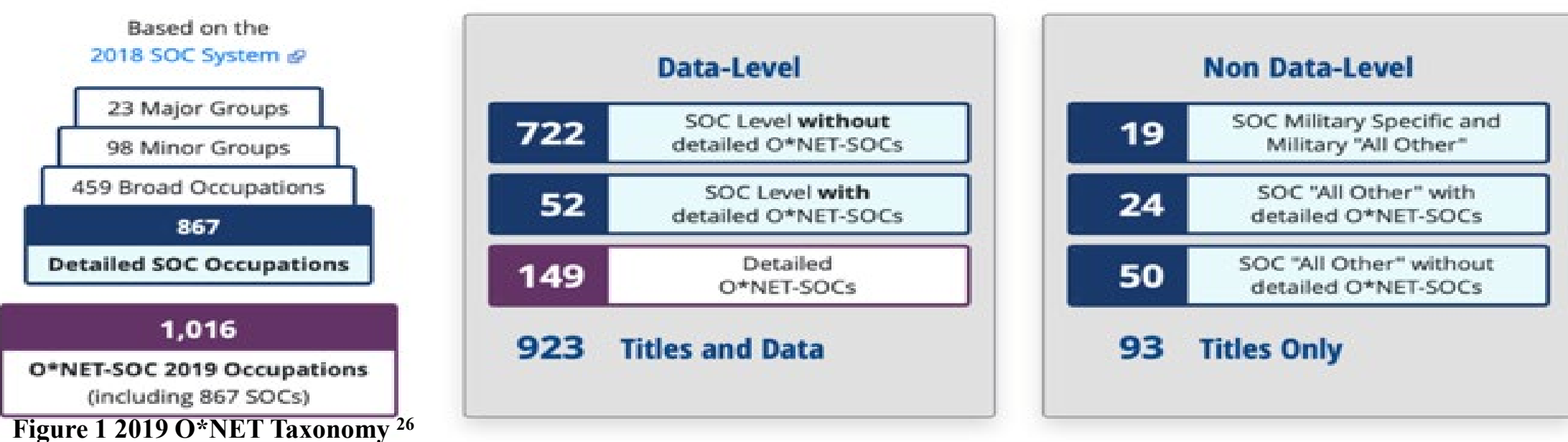
- The earlier SOC emphasized the industry in which one worked
- SOC revisions:
 - 1850 - Census of Population established the first classification of 322 occupations and included dentists, lawyers, carpenters, and others
 - 1942 - more frequent data collection began with the monthly workforce survey when the U.S. Employment Service needed occupational statistics and developed a Convertibility List of Occupations with Conversion Tables
 - 1965 - revisions to the census classification and publication of the third edition of the Department of Labor's Dictionary of Occupational Titles encouraged the government to begin a comprehensive reexamination of occupational classification
 - 1977 SOC - the very first SOC system was created to link different systems and to include all occupations for which work was performed for pay or profit
 - 1980 SOC – revised and reissued¹⁴, not universally adopted and many agencies continued collecting occupational data using classification systems that differed from the SOC
 - 1993 - BLS held an international conference to revise the SOC
 - 1994 - Standard Occupational Classification Revision Policy Committee (SOCPC) was established to spearhead the revisions that would meet the needs of the 21st century.^{13,14}
 - 1998 SOC - two-volume manual including over 30,000 job titles commonly used by individuals and establishments.¹⁵
 - 2000 SOC - revisions of 1998 SOC and the original 1977 SOC
 - 2010 SOC - retained the 2000 SOC structure, its major and minor changes increased clarity, corrected errors, and accounted for significant updates in technology, healthcare, human resource occupations, and in the nature and organization of work in the U.S. economy. Overall, the four types of revisions that took place were changes in editing (grammatical edits, improvements to definitions, descriptions of performed work), content (addition or deletion of occupational titles), titles, and codes (related to the analysis of the types of skills needed to perform the work).¹³
 - 2018 SOC - used by over 16 federal agencies and 100 other federal programs to classify workers into occupational categories to collect, calculate, and disseminate data.¹⁶
- The more recent SOC shifted the focus to the characteristics of the work performed
- Revising the SOC is a multi-year process. Each of 2010 and 2018 revisions took about 5 years to complete.
- Over the 43 years since the SOC was first introduced, it has remained a four-level hierarchy with the number of major occupation groups increasing from 21 in 1977 SOC to 23 in 2010 and 2018 SOC, and the number of detailed occupations growing from 662 in 1977 SOC, to 840 in 2010 SOC, to 867 in 2018 SOC.^{16, 18}

Dental Laboratory Technology Profession Occupational Classification

- The 1971 document known as the Position Classification Standard for Dental Laboratory Aid and Technician Series, GS-0683, issued by the U.S. Office of Personnel Management, developed to facilitate federal pay scale, included dental laboratory technology occupational classification comprised of the supervisory and nonsupervisory positions involving technical work in the fabrication and repair of dental prosthetic appliances based on prescription from a dentist, and required technical knowledge of dental anatomy and skill in the use of dental laboratory materials and equipment. The factors providing the basis for this classification were the nature of the assignment (including the duties, knowledge and skills) and the level of the responsibility. This classification resulted in three categories of Dental Technology Aid and six categories of Dental Laboratory Technician. This was the most comprehensive document classifying the dental laboratory technician occupation to date. Unfortunately, the classification changed when the 2010 Standard Occupational Classification (SOC) was updated by the BLS, and the Dictionary of Occupational Titles (DOT) was transferred to the Occupational Information Network (O*NET). It was then that the dental laboratory technician standing was altered, and a high school diploma became the minimum requirement to enter the profession. Education for dental technicians was always voluntary as dentists and dental laboratory owners opposed educated technicians for fear of higher compensations, benefits, and additional regulations.
- The Major Group for DLT occupation in 2000 SOC, 2010 SOC, and 2018 SOC classification revisions remained 51-0000 Production Occupations, Minor Group is 51-9000 - Other Production Occupations, Broad Occupation is 51-9080 - Dental and Ophthalmic Laboratory Technicians and Medical Appliance Technicians, and Detailed Occupation is 51-9081 - Dental Laboratory Technicians.
- Current OOH defines the occupation as "Dental laboratory technicians use traditional or digital impressions or molds of a patient's teeth to create crowns, bridges, dentures, and other dental appliances. They work closely with dentists but have limited contact with patients. Dental laboratory technicians work with small hand tools, such as files and polishers. They work with many different materials, including wax, alloy, ceramic, plastic, and porcelain, to make prosthetic appliances. In some cases, technicians use computer programs or three-dimensional printers to create appliances or to get impressions sent from a dentist's office. Dental laboratory technicians can specialize in one or more of the following: orthodontic appliances, crowns and bridges, complete dentures, partial dentures, implants, or ceramics. Technicians may have different job titles, depending on their specialty. For example, technicians who make ceramic restorations such as veneers and bridges, are called dental ceramists." According to OOH, dental laboratory technicians held close to 36,500 jobs in 2018 earning a median annual wage of \$40,440.00. Because of demands from an aging population, employment growth for 2018 to 2028 was projected at 11% or increase of 3,900 jobs which is much faster than the average for all occupations or as comparable to 7 percent growth for dentist occupation listed as first similar occupation. Technicians who have earned professional certification and are familiar with high tech skills, such as three-dimensional printing, are likely to have the best job prospects. More information about what dental technicians do, work environment, how to become one, pay, job outlook, data by state and area, similar occupations and more information can be found on BLS' website at www.bls.gov under "Dental and Ophthalmic Laboratory Technicians and Medical Appliance Technicians".³²
- O*NET replicates BLS' SOC in defining dental laboratory technician occupation as "51-9081.00 Dental Laboratory Technicians - Construct and repair full or partial dentures or dental appliances" in Job Zone 2 described earlier.³³ Today, O*NET lists 43% of DLT respondents having a high school diploma or equivalent, and 39% have post-secondary certificate or associate degree. Technology is frequently required in job postings for Dental Laboratory Technicians. Similarly, to OOH, O*NET lists 2018 median hourly wage at \$19.44, and annual wage at \$40,440.00 with much faster than average projected growth at 11% and 5,100 job openings for 2018-2028. According to O*NET respondents, Dental Laboratory Technicians are employed at 76% in manufacturing, 17% in health care and social assistance and 7% in other industries.³⁴
- Unfortunately, the dental laboratory technology profession became a casualty of the federal classifications' revisions changes. The validity and reliability of O*NET classification while praised by some are seriously questioned by others.

About the O*NET-SOC 2019 Taxonomy

The O*NET-SOC 2019 taxonomy structure has been revised based on the transition to the 2018 SOC. The new O*NET-SOC taxonomy includes 1,016 occupational titles, 923 of which represent O*NET data-level occupations.



Dental Laboratory Technology Education

In 1970s there were about 60 CODA-accredited formal education DLT programs, a decade ago about 20, and today only 14 programs remain.^{35, 36} Of the 14 programs admitting 319 and graduating 211 students in 2018-2019, there was only one program offering a bachelor's degree in dental technology. When comparing to 327 Dental Hygiene college-level programs enrolling 8,288 and graduating 7,377 students, or 66 dental schools with an applicant pool of 11,298, enrolling 6,250 and graduating 6,305 in 2018, the DLT formal education is disappearing. DLT education is coming to a halt when BLS predicts 11% job growth between 2018-2028 bringing an even higher demand for knowledgeable dental technicians.^{35, 37}

Standard Occupational Classification (SOC) - Process

- First Federal Register notice
- SOCPC reviews public input, federal agency input, and conducts its research to develop recommendations for OMB
- Second Federal Register notice requests public comments on SOCPC recommendations
- Final recommendations sent to OMB
- Third Federal Register notice announces the final SOC structure, occupation codes, and titles to be implemented by the Federal statistical agencies
- Reference date reflects the full implementation of the SOC data.¹⁶

Dental Laboratory Technician Occupational Classifications Proposals

Figure 7 Proposed reclassification of Dental Laboratory Technicians (51-9081) within SOC structure⁴³

<p>Removal of Dental Laboratory Technician occupation from the current SOC Classification:</p> <ul style="list-style-type: none"> • Major Group: Production Occupations (51-0000) • Minor Group: Other Production Occupations (51-9000) • Broad Occupation: Medical, Dental, and Ophthalmic Laboratory Technicians (51-9080) • Detailed Occupation: Dental Laboratory Technicians (51-9081) 	<p>Placement of Dental Laboratory Technician occupation in the proposed Major and Minor Groups and modification to create a new Broad Occupation and two Detailed Occupations given actual work performed, highest level of skill, and supervisory structure, recommended and preferred classification and coding:</p> <ul style="list-style-type: none"> • Major Group: Healthcare Practitioners and Technical Occupations (29-0000) • Minor Group: Health Technologists and Technicians (29-2000) • Proposed Broad Occupation: RESTORATIVE DENTAL TECHNOLOGISTS AND TECHNICIANS (29-20 __) • Proposed Detailed Occupation: <ol style="list-style-type: none"> 1. RESTORATIVE DENTAL TECHNOLOGISTS (29-20 __) 2. DENTAL TECHNICIANS (29-20 __) <p>Another possible and suitable placement if the above was not accepted would be:</p> <ul style="list-style-type: none"> • Major Group: Healthcare Practitioners and Technical Occupations (29-0000) • Minor Group: Health Technologists and Technicians (29-2000) • Broad Occupation: MISCELLANEOUS HEALTH TECHNOLOGISTS AND TECHNICIANS (29-2090): <ul style="list-style-type: none"> • Detailed Occupation: <ol style="list-style-type: none"> 1. Orthotists and Prosthetists (29-2091) 2. Hearing Aid Specialists (29-2092) 3. Health Technologists and Technicians, All Other (29-2099) 4. RESTORATIVE DENTAL TECHNOLOGISTS AND DENTAL TECHNICIANS (29-20 __)
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Dental Laboratory Technology Occupation Classification Changes

<p>Figure 2 DOT SVP Levels³⁸</p> <p>DOT SVP Levels</p> <p>SVP 1: Short demonstration only</p> <p>SVP 2: Anything beyond short demonstration up to and including 1 month</p> <p>SVP 3: Over 1 month up to and including 3 months</p> <p>SVP 4: Over 3 months up to and including 6 months</p> <p>SVP 5: Over 6 months up to and including 1 year</p> <p>SVP 6: Over 1 year up to and including 2 years</p> <p>SVP 7: Over 2 years up to and including 4 years</p> <p>SVP 8: Over 4 years up to and including 10 years</p> <p>SVP 9: Over 10 years</p>	<p>Figure 3 O*NET Job Zones & SVP Levels³⁹</p> <p>O*NET Job Zones</p> <p>Job Zone 1 = SVP below 4.0 occupations that need little or no preparation</p> <p>Job Zone 2 = SVP 4.0 < 6.0 occupations that need some preparation</p> <p>Job Zone 3 = SVP 6.0 < 7.0 occupations that need medium preparation</p> <p>Job Zone 4 = SVP 7.0 < 7.9 occupations that need considerable preparation</p> <p>Job Zone 5 = SVP 8.0 and higher occupations that need extensive preparation</p>
<p>Figure 4 O*NET Job Zone Two⁴¹</p> <p>O*NET Job Zone Two: Some Preparation Needed</p> <ul style="list-style-type: none"> • Education: These occupations usually require a high school diploma. • Related Experience: Some previous work-related skill, knowledge, or experience is usually needed. For example, a teller would benefit from experience working directly with the public. • Job Training: Employees in these occupations need anywhere from a few months to one year of working on-the-job experience. A recognized apprenticeship program may be associated with these occupations. • Job Zone Examples: These occupations often involve using your knowledge and skills to help others. Examples include orderlies, counter and rental clerks, customer service representatives, security guards, upholsterers, and tellers. • SVP Range: (4.0 to < 6.0) 	<p>Figure 5 O*NET Job Zone Three⁴²</p> <p>O*NET Job Zone Three: Medium Preparation Needed</p> <ul style="list-style-type: none"> • Education: Most occupations in this zone require training in vocational schools, related to the job experience, or an associate's degree. • Related Experience: Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job. • Job Training: Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers. A recognized apprenticeship program may be associated with these occupations. • Job Zone Examples: These occupations usually involve using communication and organizational skills to coordinate, supervise, manage, or train others to accomplish goals. Examples include hydroelectric production managers, travel guides, electricians, agricultural technicians, barbers, court reporters, and medical assistants. • SVP Range: (6.0 to < 7.0)

It was BLS's SOC Job Zone 2 and O*NET's SVP 4.0<6.0 downgrade that harmed the dental laboratory technology community. The consequences of such actions can be seen today in the sizable shortages of qualified dental technicians to fulfill the needs of the current market, and lower enrollment in the dental technology programs causing program closure on a startling scale. The effects of occupational classification downgrades and lack of required formal education as entry to the profession are catching up with the entire dental industry.

Conclusion

With emerging regulations and growing liabilities, digitization, innovations in materials, equipment and techniques affecting dental laboratories, the minimum requirement of high school diploma or on-the-job training as an entry to the profession needs to be raised to attract new entrepreneurs, researchers, technical and regulatory experts, and skilled professionals highly sought after in today's marketplace. With changing industry landscape, and with significant segment of technicians aspiring to enact new laws, there is a chance to make a difference during the upcoming BLS's 2028 SOC revision. By distinguishing between the educated technologists and on-the-job-trained technicians we can attract skillful newcomers at all levels of technical expertise needed to fill the void in the highly-skilled career that necessitates education, training, certification, and lifelong learning.

References can be found at: Budny, R. (August 2020). *Decoding Classifications: Implications, Impact, and Future of the BLS Occupation Designation for Dental Laboratory Technicians*. Inside Dental Technology. <https://idt.cdeworld.com/courses/5253-decoding-classifications-implications-impact-and-future-of-the-bls-occupation-designation-for-dental-laboratory-technicians>

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