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Message From the Editor

Thank you for taking the time to read the first and only issue of the 27th volume of the International Journal for Vocational Education and Training. As I edit my last issue of the journal before handing it over to a new editor, I reflect on the past several issues and the overall quality of the contributions from both authors and our editorial board. It is exciting and energizing to work with individuals so committed and passionate about the field of Technical Vocation Education and Training (TVET). This publication and its contributor have always been unique in that it offers a global perspective on TVET, and I am blessed to have been able to do my part.

This issue features several articles discussing key factors within TVET from cultural diversity in TVET to open learning. These article features a comparative study of TVET practices in African and non-African countries, a study looking at stakeholder perceptions within career and technical education, research focused on exploring high school as a barrier to success in the construction industry, and a follow up study focused on work-life balance of US construction apprentices. Finally, this issue includes a special feature article. This article looks at different opportunities for open learning within TVET.

As I finalized my last issue as editor, I would again like to thank everyone that made each issue possible. I truly appreciate everyone's patience, understanding, and support and look forward to the journal's editorial leadership under Dr. Julie Furst-Bowe. For anyone interested in serving as a reviewer for upcoming issues of the journal or looking to publish quality TVET research please contact the new editor at juliefurstbowe@gmail.com.

Luke J. Steinke, PhD

Editor—International Journal for Vocational Education and Training

CULTURAL DIVERSITY AND SOCIAL CAPITAL IN THE EDUCATION OF TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING STUDENTS: A COMPARATIVE CASE STUDY OF TVET PRACTICES IN AFRICA AND NON-AFRICAN COUNTRIES

Jeffrey B. Matu

ABSTRACT

The purpose of this paper is to develop a systematic review on integrating cultural diversity and social capital dimensions in technical and vocational education and training (TVET) based on regional experience of Africa, Middle East and Northern Africa, and the Northern America, where specific countries from these regions, such as Germany, Kenya, United Arab Emirates, and the United States, were chosen. It analyzes the role of TVET in providing inclusive and equitable quality education and training to a diverse population for social mobility and economic opportunity. The Preferred Reporting Items for Systematic Reviews (PRISMA) statement was used as a formal systematic review guideline for data collection. A functional, organizational, and political approaches (FOPA) model and cosmo-uBuntu were applied as a conceptual framework lens to review the literature on the development of cultural diversity and social capital dimensions in TVET. FOPA is a lens for examining how the relationship between TVET institutions, education stakeholders, including the private sector, and the government influences TVETs' ability to address community needs and contribute to economic growth. On the other hand, Cosmo-uBuntu is a humanitarian, theoretical, and solution-oriented approach to integrating cultural diversity and social capital into TVET that addresses issues of social justice in order to meet the needs of the community and contribute to economic development initiatives. Data was obtained from research studies and reports over the period 2000 – 2021. The analysis included a total of 662 documents from ERIC (ProQuest), ProQuest Education Journals, and CONFINTEA databases with resources for adult education and workforce education. The results show that there is a lack of shared understanding of the integration of cultural diversity and social capital dimensions of TVET education. In order to promote an inclusive and equitable education and training, it is essential to address some assumptions about the concept of cultural diversity and social capital – what it means and how it can support the sustainable development of a globally competent workforce. Findings indicate that TVET is aware of the importance of cultural diversity and social capital dimensions in education but lacks clarity on implementing it.

Keywords: *technical and vocational education and training, cultural diversity, social capital, skills development, postsecondary education, Germany, Kenya, United Arab Emirates, United States*

INTRODUCTION

Technical and Vocational Education and Training (TVET) has been evolving and expanding at a rapid pace in recent years as industry and education leaders focus on students' readiness for the world of work. To ensure that TVET remains a key pathway for social mobility and economic opportunity, it is critical to understand methodological issues in TVET, including the challenges and opportunities of cultural diversity and social capital. TVET is a necessary pathway for a large segment of the population for their social and economic prosperity, which led to the United Nations' Sustainable Development Goals (SDGs) placing prominence on the need of countries to enhance the role of TVET to meet the needs of the projected workforce demands of the knowledge economy. Particular, the goals of SDG 4 (ensure inclusive and equitable quality and promote lifelong learning opportunities for all) and SDG 8 (promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all) have specific targets for TVET, such as developing a highly-skilled, globally competent workforce to meet their national SDG commitments of providing quality education to achieve decent work for all (UNDESA, 2015).

For countries to achieve SDG 4 and 8 commitments, TVET must ensure equitable educational access for an increasingly diverse student population, promote lifelong learning opportunities, and deliver quality education. TVET can play a critical role in this effort by achieving effective and inclusive partnerships, engaging with TVET policymakers to visualize the impact of quality TVET, providing TVET teachers/trainers/instructors with professional development opportunities to ensure sufficient proficiency and industry standards, and ensuring inclusive (emphasizing equity, inclusion and gender equality) and quality TVET for all (UNDESA, 2015).

While TVET education benefits students of all backgrounds, there are likely to be distinct economic benefits for low socioeconomic status students (low income, minority, migrant, first-generation, special needs population, vulnerable groups) who are more likely to have difficulties transitioning to the world of work and often are in poor employment outcomes (Cincinnato, Wever, Keer, & Valcke, 2016; Kevelson, Marconi, Millett, & Zhelyazkova, 2020). As the digital revolution rapidly transforms the world of work and the skills profiles of many occupations, TVET needs to remain a powerful vehicle for education and training for productive employment and citizenship. However, the dearth of TVET education orientations has led to mixed outcomes where many students still find themselves undereducated with skills deficits that have left them with poor employment outcomes. This is mainly due to policy shortcomings in vocational education orientation that have neglected to account for cultural diversity and social capital in supporting students to build connections outside their network with industry to enhance their career readiness and transition to the world of work. Compared to students with substantial cultural and social capital with similar academic qualifications, low socioeconomic status students are more likely to have difficulties transitioning to the world of work and often are in poor employment outcomes (Cincinnato et al., 2016; Kevelson et al., 2020). This phenomenon highlights the challenges of cultural diversity and social capital in

vocational education orientation that further perpetuates socioeconomic inequality and hinders a country's ambition to develop a highly skilled and globally competent workforce.

In the past, TVET was frequently criticized for its weakness as a skills development and workforce development strategy, its reluctance to adapt education and training to the constantly evolving world of work, and its inability to meet the needs of a diverse population in enhancing their social mobility and economic opportunities (Shreeve, Gibb, & Ribeiro, 2013). Thus, several efforts have been made at the policy level to ensure that TVET meets these identified challenges. For instance, the U.S. Department of Education adopted the Every Student Succeeds Act (ESSA) to ensure that the U.S. education system is inclusive and promotes diversity in the schools. In Germany, the national qualifications frameworks (NQF) link diversity and inclusion practices into the TVET system (Singh & Duvekot, 2013), while in Kenya and the United Arab Emirates (UAE), education policies focus on the needs of people with disabilities rather than on diverse populations (CBM, 2019; UAEMOE, n.d.).

In order to facilitate shared understanding, it is essential to address some assumptions about the concept of cultural diversity and social capital in the context of social mobility and economic opportunities. In the context of cultural diversity, the lack of clarity means, for instance, that inclusive education can be limited to focus on the needs of people with disabilities rather than more broadly focusing on the social classes within the group and the power dynamics for social mobility (Kisang, 2010). In the context of social capital and similar to cultural diversity, there is a lack of understanding of what social capital means for economic opportunities. Studies on social capital have shown that it enables individuals to access resources through social networks and relationships to promote economic opportunities (Tognatta, 2014).

To address the methodological issues in TVET orientation, Cossa and Matu argue that TVETs in the Global South must be informed by philosophies ingrained in the local culture, such as uBuntu and cosmo-uBuntu in the African context if cultural diversity and social capital dimension are to be achieved in developing a sustainable globally competent workforce through TVETs (Cossa, InPrint; Cossa & Matu, InPrint). This is not new but very necessary when considering the role of cultural diversity and social capital in facilitating an inclusive and equitable quality education and training in TVET. With this in mind, a broad perspective about cultural diversity and social capital in TVET will be considered, taking into account the following conceptual dimensions:

- Cultural diversity refers to "a system of belief and behavior that recognizes and respects the presence of all diverse groups, acknowledges and values their socio-cultural differences, and encourages and enables their continued contribution within an inclusive cultural context which empowers all in a school" (Rosado, 2012).
- Cultural diversity implies the ability of schools to provide an equitable and high-quality learning experience for all students (Cordeiro, Reagan, & Martinez, 1994).

- Cultural diversity is visible in the school setting when curricula and pedagogical approaches are adopted to the authentic local context (Cossa, InPrint; Cossa & Matu, InPrint).
- Social capital refers to the "accrued actual or virtual resources acquired by individuals or groups through the possession or more or less institutionalized relationships of mutual acquaintance and recognition" (Bourdieu & Wacquant, 1992).
- Social capital implies that "interpersonal relationships create value for individuals as they provide resources which can be used for achieving desired outcomes" (Adler & Kwon, 2002).
- Social capital is visible when searching for jobs, and it influences career successes (Adler & Kwon, 2002).

Thus, these perspectives about cultural diversity and social capital underlie the aim of this study, which intends to develop a systematic literature review in order to understand how cultural diversity and social capital is integrated into the TVET program to prepare students for career and life successes, including the potential public benefits of doing so. To attain this goal, the following research questions were defined:

- Are current models of TVET adept at preparing workers for the constantly evolving world of work in an age of technological transformations and transition to employment?
    - ◊ What are the framing and the context in which TVET models are implemented? The historical, social, economic, and political context and how is it anchored in society?
    - ◊ What policies and practices guide these TVET models? Have they achieved their intended objectives? What aspects of the policies and practices worked, and which did not work?
    - ◊ How are these TVET models delivering career development to students? How is career direction and planning provided?
    - ◊ How are these TVET models integrating employer perspectives into teaching (curriculum and pedagogy) for career readiness? How are employer perspectives used to inform preparing students with well-developed careers and technical knowledge?
- How are these TVET models fostering inclusive and equitable quality education and training to a diverse population for social mobility and economic opportunity?
    - ◊ How are students linked to opportunities that enhance their career readiness? (For example, do these TVET models have tasks that require students to interact with industry or alumni that they have no access to and arrange for a student to participate in activities beyond a class context?

- How are these TVET models integrating local cultural dimensions in the curriculum and pedagogical approaches to foster community-based learning to improve student engagement, school grades, as well as helping a student to learn? How are these TVET models humanizing education in the communities where they are delivered?

METHOD

A systematic literature review offers a practical process of reviewing a vast amount of literature transparently and clearly and is often characterized by "transparency, clarity, equality and accessible, unified and focused" (Sirelkhatim & Gangi, 2015, pg. 2). This paper follows the Preferred Reporting Items for Systematic Reviews (PRISMA) 2020 statement guidelines to conduct the literature review (BMJ, 2021). PRISMA provides peer accepted guidelines that include a checklist and flow diagram used in this paper to guide the document selection criteria, search strategy, data collection, and analysis procedures (PRISMA, 2020a, 2020b). In addition to PRISMA, this paper also applies a functional, organizational, and political approaches (FOPA) model and cosmo-uBuntu as a conceptual framework to guide the data selection, analysis, and results (Cossa, InPrint; Knight, 2013). The fundamental objective of using this conceptual framework to PRISMA was to structure the review question and organize the search strategy for discovering relevant papers based on cross-disciplinary themes.

Data Sources and Search Strategies

A systematic search of three electronic databases - ERIC (ProQuest), ProQuest Education Journals, and CONFINTEA- primarily focused on adult education and workforce development for articles and documents published between 2000 to 2021 used in this study. To identify as many eligible articles, books, conference papers, and technical reports as possible, the search terms used included vocational education AND training AND technical AND vocational education AND training AND career technical education AND skills development AND employability AND industry partnerships AND social capital AND cultural diversity OR united states AND Germany OR Kenya AND United Arab Emirates. A filter was used to narrow the search that included "adult basic education" OR "higher education" OR "adult education" OR "postsecondary education" OR "two-year colleges."

Selection of Data

Figure 2 illustrates the procedure that was followed to find and select the data for this paper. An initial review of the data was used to determine the eligibility of articles and documents based on the search terms. A second step involved reviewing the full text to determine whether they have value and relevancy to the topic being reviewed by this paper.

Eligibility Criteria

Data that did not have a full text available and documents that only focused on employees rather than students were eliminated. A selection criterion was also established according to the research question, and the results are organized in table 1, which did not describe the process of providing inclusive and equitable quality education and training to a diverse population for social mobility and economic opportunity through TVET.

Table 1. Study inclusion and exclusion criteria

No.	Inclusion criteria	Exclusion criteria
1	Documents are written in English	Documents not written in English
2	Full-text documents that are accessible	Documents that do not have full-texts available
3	Documents related to guiding principles for a workforce development ecosystem (meeting all learner needs, work-based learning and skills development, meeting employer needs, government policies, and industry-recognized standards)	Documents not related to workforce development ecosystem (meeting all learner needs, work-based learning and skills development, meeting employer needs, government policies, and industry-recognized standards)
4	Documents published in the era of the MDGs and SDGs from 2000 to 2021 and include a global focus or focus on Kenya, Germany, the U.S., and UAE	Documents published before 2000 and do not include a global focus or focus on Kenya, Germany, the U.S., and UAE
5	Documents published as journal articles, conference proceedings, technical reports, periodical issues, dissertations, and theses, or working papers	Documents published as books, program and meeting documents, speeches, and presentations

To ensure that TVET is meeting the challenges related to the needs of the workforce development ecosystem - meeting all learner needs, work-based learning and skills development, and meeting employer needs, it has to ensure equal access to meaningful skills development opportunities aligned to industry needs to support social mobility and economic opportunity. In this context, the conceptual framework – FOPA model and cosmo-uBuntu was used to guide the data selection, analysis, and results (Cossa, InPrint; Knight, 2013).

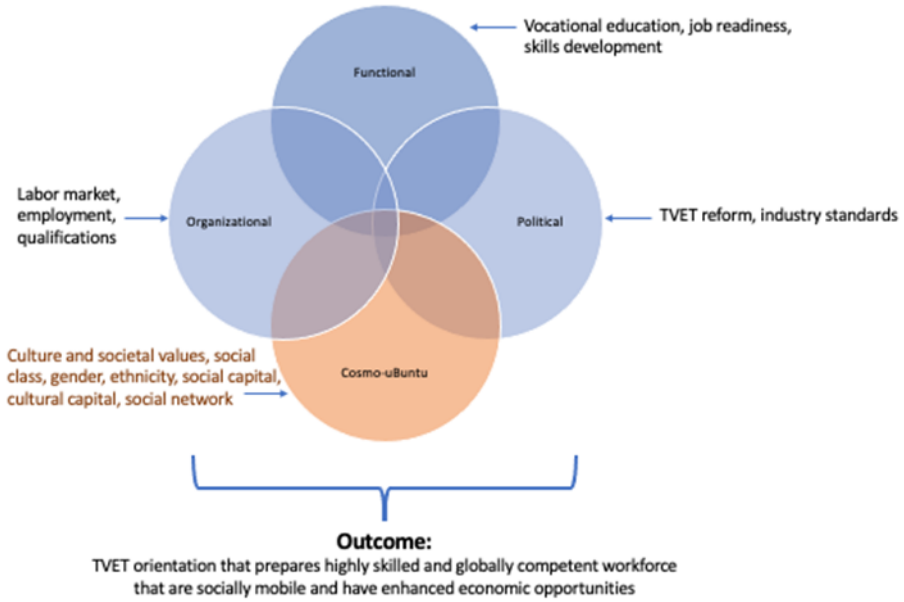

Figure 1. Conceptual framework (adapted from Cossa, InPrint; Knight, 2013)

Table 2. Conceptual framework terms

Conceptual Framework	Lead Entity	Objective	Concept-based on
Functional	TVET Institutions	The primary focus includes labor market success, public service to society, and the development of students' skills through curriculum and pedagogical approaches in the alignment of TVET systems.	(Knight, 2013)
Organizational	Industry and TVET stakeholders	The primary focus includes promoting relationships through collaboration with the various constituencies, stakeholders, and communities to ensure that the TVET system is socially accountable through governance and accountability arrangements.	(Knight, 2013)
Political	Government and standards agencies	The primary focus includes improving education quality through increasing appropriations (e.g., funding and resources) and setting standards to keep pace with enrollment growth and market requirements.	(Knight, 2013)
Cosmo-uBuntu	Local community	The primary focus includes promoting equity and inclusion through leveraging cultural diversity and social capital to build authentic, collaborative relationships across and between	(Cossa, InPrint)

Data Analysis and Coding

Based on the search terms, a total of 662 documents were yielded. After the application of the eligibility criteria, 63 documents were yielded, which was further narrowed to a total of 30 documents relevant to the systematic review. An excel sheet was used to record information about each of the documents in an organized form, including codifying (number of the paper and its databases; Eric = E, ProQuest Education = P, and CONFINTEA = C) each of the selected documents. Figure 2 presents the data analysis process using the PRIMA flowchart diagram to highlight the data analysis results (Goagoses & Koglin, 2019; PRISMA, 2020b).

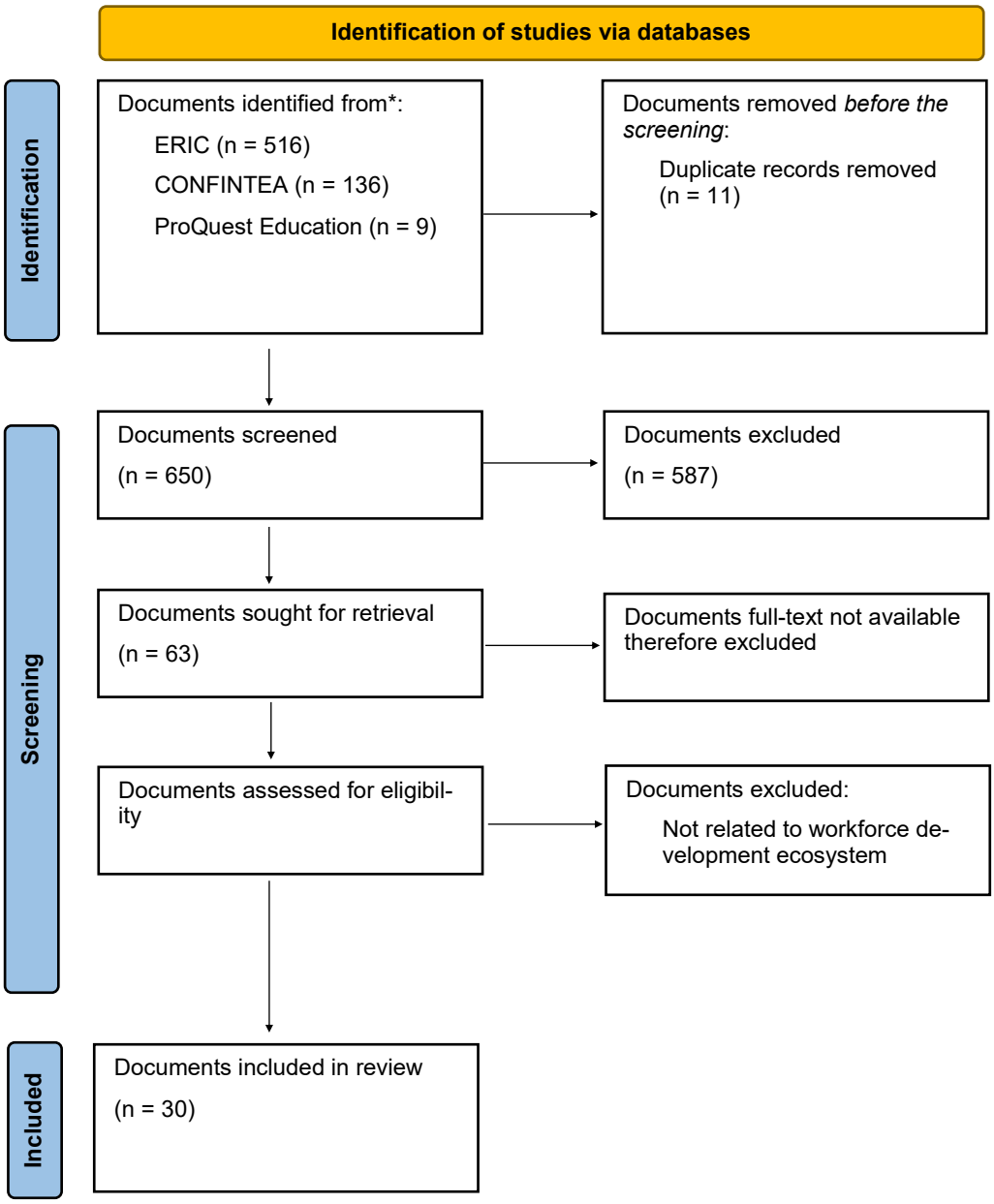

Figure 2. Literature review document selection process flow (adapted from PRISMA, 2020b)

Appendix A presents all the papers included in the systematic literature review (n=30) and the codification used to identify each of the papers, which will be used in the next section to discuss the analysis results.

REVIEW OF INCLUDED DOCUMENTS

Research Methodologies in the Documents

Research Type

When the documents were analyzed according to their research methods, 23 qualitative, 3 quantitative, and 4 mixed methodologies were used for the investigated phenomenon.

Specific Design

In terms of specific research design types, pretest-posttest design, comparative study were mentioned as the quantitative research design types applied, whereas case study and narrative research design were mentioned as the qualitative research types.

Sample Population

The primary sample population in the examined documents was students and teachers. However, in 9 technical documents (reports and periodical issues), the sample population observed had a wide scope and included all the stakeholders involved in a workforce development ecosystem.

Sample Size

The sample sizes in the examined documents that used a qualitative research methodology were found to be in the range of 1 to 30. Thus, it can be said that about half of the examined documents had a sample size of <50, which means that their findings may not be generalizable (Baker & Edwards, 2012). However, in the case of the quantitative and mixed methodologies documents, they were found to be in the range of 10 to 120,789. Additionally, while the sample size was not provided in the UNESCO and OECD technical documents, it can be assumed that the intergovernmental agencies use household surveys, which collect comprehensive and diverse socio-demographic data pertaining to conditions under which people live and usually includes a large sample size. In this instance, their findings may be generalizable.

Data Collection

The data collection used in the examined documents for qualitative research method were interviews (n = 10) and observations (n = 13). The preferred data collection method for quantitative research methods was surveys (n = 4). The preferred data collection for the mixed methods were interviews and surveys (n = 4).

Data Analysis

The qualitative collected data were generally analyzed using a document analysis where the researchers used an inductive coding process. For the quantitative analysis, the data were

analyzed using descriptive and inferential statistics, t-test, and ANOVA, where the researcher used a statistical model for analysis.

Variables

The variable used in the examined documents covered the entire scope of a workforce ecosystem – TVET institution, industry and education stakeholders, government, and the community (students and workers), which corresponds well with the collaboration of actors needed to facilitate an inclusive and equitable system. Common variables can be categorized into learning outcomes, partnership outcomes, standards outcomes, and inclusive and equity outcomes. Table x shows the variables that are focused on by the selected documents. These variables can be interpreted as having a strong relationship with making TVET an inclusive and equitable system to promote social mobility and economic opportunity.

Table 3. Summary of variables in the examined documents

Category	Variables	N	Document
Learning outcomes	skills development	n = 25	3E, 5E, 8E, 10E, 13E, 16E, 20E, 22E, 26E, 27E, 28E, 31E, 33E, 34E, 36E, 38E, 40E, 45E, 47E, 50E, 53E, 55E, 58E, 62P, 63C
	employability	n = 9	8E, 13E, 20E, 22E, 26E, 31E, 34E, 36E, 40E
	job readiness	n = 8	8E, 9E, 13E, 22E, 26E, 39E, 42E, 45E
	college readiness	n = 1	22E
Partnership outcomes	share ideas of expertise	n = 4	9E, 39E, 58E, 63C
	curricula to industry alignment	n = 2	16E, 40E
	leverage investments	n = 1	16E
	enhance teacher capacity	n = 1	38E
	institutional autonomy	n = 1	33E
	governance	n = 3	33E, 40E, 42E
	accountability	n = 3	33E, 40E, 42E
Standards outcomes	assessment and certification	n = 6	20E, 38E, 40E, 50E, 55E, 58E
	teaching standards	n = 3	15E, 31E, 40E
	industry standards	n = 12	10E, 20E, 26E, 27E, 28E, 34E, 36E, 39E, 40E, 50E, 58E, 63C
	transparency	n = 3	9E, 10E, 40E
Inclusive and equity outcomes	intercultural competence	n = 7	3E, 5E, 12E, 15E, 53E, 62P, 63C
	cultural capital	n = 2	27E, 62P
	cultural mobility	n = 2	27E, 62P
	cultural diversity	n = 9	27E, 28E, 31E, 34E, 40E, 47E, 53E, 62P, 63C
	social network	n = 2	27E, 62P

Note: The number linked with the listed data denotes the data's location in the corresponding database, while the letters denote the database from which the data was obtained (Eric = E, ProQuest Education = P, and CONFINTEA = C)

Research Aims and Research Questions

In terms of aims of the 30 documents examined, the primary focus was inclusion and equity (meeting all learner needs), job readiness (work-based learning and skills development), partnerships and collaboration (meeting employer needs), and policies and standards (government policy and industry-recognized standards) as the primary approach of activities embedded in a TVET orientation.

Of the 30 included documents that were examined, 18 had clearly stated research questions and/ or hypotheses. Where only 8 of the documents mentioned the hypothesis, all of the others were in the form of research questions.

Main Findings

The major themes to emerge from the examined documents on cultural diversity and social capital in the education of TVET students can be summed up under the following subgroups: inclusion and equity (meeting all learner needs), learning (work-based learning and skills development), partnerships (meeting employer needs through collaboration), and standards (government policy and industry-recognized standards).

This section presents the main findings found through the systematic review process and conceptual framework, which is organized according to the research questions that guided the document search and analysis.

Are current models of TVET adept at preparing workers for the constantly evolving world of work in an age of technological transformations and transition to employment?

> **Learning Outcomes** [3E, 5E, 8E, 9E, 10E, 13E, 16E, 20E, 22E, 26E, 27E, 28E, 31E, 33E, 34E, 36E, 38E, 39E, 40E, 42E, 45E, 47E, 50E, 53E, 55E, 58E, 62P, 63C]

One of the main findings associated with integrating cultural diversity and social capital in TVET in the systematic review is learning outcomes. For example, the purpose of papers 3E, 5E, 53E, 62P, and 63C was to examine the role of cultural diversity in TVET education to promote an inclusive learning environment to enhance student learning. 5E found that integrating intercultural experiential exercises increased intercultural awareness in students. The purpose of paper 8E focused on career-related learning through integrating labor market information in education to provide students with career guidance and deliver a hands-on experience that is directly relevant to the student's intended career. The purpose of 10E, 20E, 26E, 27E, 28E, 34E, 36E, 39E, 40E, 50E, 58E, and 63E examine the role of standards (federal policies in the U.S. and national qualifications framework in Germany) in providing a framework for learning and teaching that ensures that students achieve set competency standards and teachers have the proficiency in meeting student learning targets. Paper 62P found that social networks play a role in influencing academic performance, and students perform better when their social ties are strengthened.

Partnerships Outcomes [9E, 16E, 33E, 39E, 40E, 42E, 58E, 63C]

The relationship between TVET with industry and workforce education stakeholders has been of paramount importance in ensuring the quality of TVET education and the development of relevant skills in demand in the world of work. For example, the purpose of paper 33E, 39E, 40E, 42E, and 58E was to examine how a strong and dynamic bond between TVET and external stakeholders lead to collaborative efforts in integrating industry demands in the academic program of study, including assessment and certification procedures that show mastery of knowledge or skills associated with occupational competency. Paper 9E found that partnerships in TVET education with industry promote greater labor market transparency where industry shares their employment needs through a labor market information system, which improves employment prospects for students, informs career development, and increases economic mobility. Paper 16E found that partnerships between TVET and external stakeholders bring lifelong learning through initiatives or arrangements where the industry funds up-skilling training courses to support training and development for staff to respond to the changing world of work. Paper 63 argues that diverse TVET partnerships that include community collaboration, industry, and educational stakeholder partners can help advance closing the equity and socioeconomic opportunity gaps and ensure that students have an opportunity to reach their full potential through expanding access to information and opportunities.

Standards Outcome [9E, 10E, 20E, 26E, 27E, 28E, 34E, 36E, 38E, 39E, 40E, 50E, 55E, 58E, 63C]

The role of standards in TVET education is to describe the work tasks to be carried out within a specific occupational activity framework. For example, the purpose of papers 9E, 10E, 20E, 26E, 27E, 28E, 34E, 36E, 38E, 39E, 40E, 50E, 55E, 58E, 63C is to show the related knowledge, skills, and abilities that standards describe for a specific occupational activity that needs to be met before students can be considered competent and ready for the world of work. Paper 10E examines how national qualifications systems meet performance standards and how they evaluate the extent to which TVET meet the needs of industry and found that standards play an important role in describing which groups of work activities much be undertaken before the end of the course, including the minimum level of knowledge and skills that must be demonstrated. Paper 63C argues that incorporating cultural diversity standards in TVET education supports sustainable development for students, communities, and countries. TVETs need to be reoriented to promote acceptance of cultural diversity to contribute to the prevention of conflict to build peace and development.

How are these TVET models fostering inclusive and equitable quality education and training to a diverse population for social mobility and economic opportunity?

Inclusion and Equity [3E, 5E, 12E, 15E, 27E, 28E, 31E, 34E, 40E, 47E, 53E, 62P, 63C]

Papers 3E, 5E, 12E, 15E, 27E, 28E, 31E, 34E, 40E, 47E, 53E, 62P, 63C highlighted the benefits of activities that promote intercultural competence, cultural capital, cultural mobility, cultural diversity, and social network in meeting the needs of all learners. The purpose of papers

3E, 5E, 12E, 15E, and 31E found that the best way to develop intercultural competence is through a study abroad program to facilitate cooperation and communication with people from other cultures that lead to students and teachers having cultural self-awareness and multicultural knowledge. Paper 27E found that students coming from low socioeconomic status households and communities miss access to opportunities that can support their socioeconomic mobility leading to poor income and health outcomes. In this instance, paper 27E found that understanding the challenges related to cultural diversity in education allows TVETs to take a culturally responsive approach to teaching and to learning that benefits all students and prepares them to thrive in an exponentially diverse world. Papers 28E, 31E, 34E, 62P, and 63C argue that TVET needs to adopt culturally responsive strategies to ensure that the TVET environment and education are responsive to the increasing cultural diversity of our society through enhancing each student's sense of identity and promoting students' cultural awareness.

DISCUSSION

The documents examined in the systematic review provide insight into cultural diversity and social capital dimensions that are integrated into TVET systems in Germany, Kenya, UAE, and the U.S. The documents identify the issues related to cultural diversity and social capital in relation to TVET orientation in facilitating an inclusive and equitable TVET education. The findings reveal that the documents are mostly aimed at identifying which TVET structures, reforms, policies, and practices are effective in promoting inclusion and equity (meeting all learner needs), learning (work-based learning and skills development), partnerships (meeting employer needs through collaboration), and standards (government policy and industry-recognized standards). In this regard, four ideas might be interesting to explore, considering the main findings of the examined documents.

The first idea focuses on the TVET orientation of Germany, Kenya, UAE, and the U.S., which were selected due to the large number of diverse populations represented in their society and their documented challenges with cultural diversity and social inclusion in supporting student learning outcomes. For example, Germany and the U.S. are one of the largest economies in the world and have attracted economic migrants, including having a significant minority population, who often face challenges related to social inclusion in education and training, and employment (Durazzi & Geyer, 2020; Goldan, Hoffmann, & Schwab, 2021; Hunt, Prince, Dixon-Fyle, & Yee, 2018; Shortall & Warner, 2010). In the instance of Kenya and UAE, both countries are considered to be culturally diverse based on the Cultural Diversity Index – where Kenya is ranked as the 6th most culturally diverse country in the world and UAE is considered the most culturally diverse country in the Middle East and Northern African region (Gören, 2021) and both countries have initiatives to integrate refugees and labor migrants (Bellino & Dryden-Peterson, 2018; Thiollet, 2011). Thus, according to findings, developing intercultural competencies have been effective in addressing a variety of social inclusion issues – from creating opportunities for students to learn, practice, and incorporate principles related to cultural self-awareness and multicultural knowledge into their lives to develop intercultural competence (3E) to facilitating study abroad programs for teachers and students to provide

experiences that prepare them to interact with a diverse population (5E), to integrating culturally responsive approaches in curriculum and instruction to make learning effective, relevant, and equitable for all students (31E) to programs which promote language, particularly delivering TVET education in the local language to create a sense of community and is critical is the transmission of knowledge and values that are important social function and promotes sustainable development (28E). This opens an opportunity for future research to understand how cultural diversity and social capital dimensions are being integrated into TVET, particularly understanding how global commitments such as the SDGs inform TVET.

It is also important to highlight other findings related to learning outcomes. In the U.S., the TVET orientation focuses on pathways that ensure coursework is simultaneously aligned to academic standards and trade-focused learning that promote job and college readiness. Paper 8E compares the U.S. and the Organization for Economic Cooperation and Development (OECD) countries to explore whether young adults who are disconnected or not being in education, employment, or training (NEET) with at least a 2-year college degree are more likely or not to participate civically and found a mixed result. In the instance of the OECD countries, the study found that a 2-year college degree increased the likelihood of civic participation among NEETs; however, this was not the case in the U.S., where it was found that family and socioeconomic background was more of an influencing factor in civic participation of NEETs in the U.S. This instance shows that learning outcomes achieved from a 2-year college degree, family background, and the socioeconomic context influence civic participation that is fundamental for sustainable development.

The second idea focuses on the role cultural diversity and social capital dimensions can play in promoting standards outcomes to effectively prepare students for work with relevant skills and opportunities critical for socioeconomic opportunity. Paper 15E highlights the experience in Germany and the U.S. in promoting culturally responsive practices for equitable learning environments through leveraging culture and cross-cultural differences in the classroom. Paper 31E found that effective cultural practices use cultural knowledge, learning styles, and prior educational and personal experience to make learning effective, relevant, and equitable for all students. While shifts in the racial, ethnic, cultural diversity of students in TVETs are calling teachers to increasingly adopt culturally responsive practices, including better representation of teachers from diverse groups, it has not necessarily translated to effective culturally responsible practices (31E). In this context, papers 3E, 12E, and 31E found that interventions to promote teacher intercultural competencies and college-wide procedures to bridge cultural gaps will be critical in guaranteeing that teachers have the skills to support positive cross-cultural interactions and enhance cultural competence responsive practices in TVETs. This opens an opportunity for future research to understand what role cultural diversity and social capital can play in promoting TVET standards.

The third idea focuses on the intersection of cultural diversity and social capital dimensions in promoting partnership outcomes that provide financially and resource support for the TVET, broaden the experience of students and teachers, enhance local and regional economic development, and increase employment opportunities for students. Paper 9E found that TVETs

facilitate student access to participate and interact with employers from industries with the most opportunity for socioeconomic mobility through partnership arrangements with employers. Papers 13E, 20E, 26E, and 39E found that successful apprenticeships are based on strategic industry partnerships between TVETs and employers to connect students to economic opportunities while meeting their education and skills needs. This opens an opportunity for future research in understanding to what extent cultural diversity and social capital dimensions influence partnerships with industry, education stakeholders, and the community.

The fourth idea focuses on identifying cultural diversity and social capital activities that facilitate inclusive and equitable practices that can increase inclusivity by supporting the learning of all students through the adaptation of authentic experiences that are relevant to their lives and interests. Papers 3E and 5E define intercultural competence as "recognizing and appreciating one's own and others' multiplicities" and that it is tightly linked to empathy, listening flexibility, and tolerance. Paper 3E found that acquisition of intercultural competence through an experiential learning process, including exposure and interaction with people of different cultural backgrounds. Papers 3E and 12E mentioned that experiential learning activities could include study abroad programs and games to trigger reflection among the students and teachers and increase intercultural competence. This opens an opportunity for future research in understanding the specific cultural diversity and social capital activities in promoting an inclusive and equitable TVET environment and how to measure them.

The question that arises from this discussion is: How do the SGDs inform TVETs in integrating cultural diversity and social capital dimensions to promote inclusive and equitable education? How can the impact of cultural diversity and social capital be assessed? Based on the systematic review, there was scarce information on the linkages between the SDGs Goal 4 and 8 with the TVET orientation. Paper 28E found that to achieve the SDGs, multilingual and multicultural approaches in education will depend on the involvement of local communities for its success. In the review of documents, it is noteworthy that there is a lack of research understanding of how cultural diversity and social capital dimensions can be integrated to promote an inclusive and equitable TVET system. There is a need for research to understand how the SGDs inform TVETs and how cultural diversity and social capital dimensions can be assessed.

LIMITATION

This systematic review used the PRISMA methodology and applied the FOPA and cosmo-uBuntu conceptual framework to identify as eligible documents as possible. The search terms were broad to encompass keywords commonly used in the workforce development ecosystem and were limited to three databases that focus on adult education and workforce education - ERIC (ProQuest), ProQuest Education Journals, and CONFINTEA databases. As a result, important original documents on cultural diversity and social capital in TVET may have been missed. This led to a selection of only 30 papers representing 4 countries.

RECOMMENDATION AND IMPLICATION

Based on the examined documents in this systematic review of cultural diversity and social capital in TVET education, the findings suggest important weaknesses in the literature; thus, continued advancement of knowledge about the field is not occurring effectively. The following are recommendations for future research that address these weaknesses are presented below.

- Conduct a study to understand how global commitments such as the SDGs inform TVET. Reducing inequalities in TVET between and within countries remains one of the most important challenges facing the global community in promoting inclusive and equitable TVET education for sustainable development. An exploration of this research study and its application to reduce inequalities in TVET can reveal interesting contracts between higher-income and lower-income countries or global north and global south with how the SDGs are interpreted and implemented.
- Conduct an empirical study to understand social inclusion in education and employment, including exploring the tensions between inclusion and individual choice experienced by students. Problems related to social inclusion, such as lack of access to education and training opportunities or employment for students in low socioeconomic groups, can persist for years without gaining much attention. Generic policy solutions exist, such as the Equal Employment Opportunity Act and Every Student Succeeds Act in the U.S. (USDOE, 2015), yet these policies emerge only when events of a certain type cause the problem and solution streams to run together through a brief window of opportunity. Policy solutions that are enacted are thus blends of the ways in which problems are framed as issues (e.g., all people have a right to education), particular solutions that can be applied to the problems (e.g., expanding existing educational opportunities for the poor and vulnerable communities), and the balance of power among actors within the political stream. For example, Germany's Federal Training Assistance Act (BAföG) guarantees education for all and ensures that young people can afford a good education regardless of their parents' income (FRG, 2018). Therefore, framing the ways in which problems and solutions are presented is critical because political actors settle on solutions that come closest to their goals and values.
- Conduct a study to understand what role cultural diversity and social capital can play in enhancing partnerships with industry, education stakeholders, and the community. Because innovation requires diversity – differences in race, gender, ethnicity, physical capabilities, and sexual orientation, social or political differences, employers in the 21st century can no longer rely on the expertise of one group to keep them in front of the skills queue and will need to tap into a diverse group to stay ahead (Page, 2007). Employers will need to collaborate with educational institutions to widen their talent pool to overcome this. An exploration of this research study and its application to strengthen partnerships to access a diverse pool of workers can reveal interesting contracts between multinational and local companies in terms of partnership arrangements and activities to enhance the partnership.

- Conduct studies to examine behavioral skills related to intercultural competence, such as changes in social skills, demonstrating empathy in addition to self-reporting measure (3E). Paper 3E found that short-term study abroad programs that include game activities such as a scavenger hunt increased certain areas of students' intercultural competencies though the findings could not be generalizable due to the small sample size. In this instance, future research should look to larger and more heterogeneous samples that could result in generalizable findings.

Implication for Practice

Enhancing the understanding of each of the activities involved in delivering cultural diversity and social capital in TVET and learning how to facilitate them will allow teachers to obtain additional insight into how cultural diversity and social capital can support students' social mobility and economic opportunity.

Implication for Research

Overall, the systematic review on cultural diversity and social capital dimensions in TVET revealed an interesting contrast between higher-income and lower-income countries or global north and global south with the manner in which diversity and social capital dimensions applications in TVET were presented. A potential suggestion for future research lies in exploring how the SDGs are interpreted and implemented to promote inclusive and equitable TVET education to support students' socioeconomic mobility and sustainable development. As such, it would be recommended to determine how SDG adaption in TVET differs across countries, as this would allow for a greater degree of standardization of and uniformity in the various cultural diversity and social capital activities that are utilized around the world.

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Appendix A

No	Data-base	Publication date	Type of Research	Author/s	Title	Region/ Country
3	E	Jan 2021	Quantitative	Ryan M. Zayac, Sydney Miller, Wolfgang Lenhard, Amber Paulk, and Kirby Chrysler	Short-Term Study Abroad in Psychology: Effects of a Cultural Scavenger Hunt on the Development of Intercultural Competence	U.S.
5	E	Sep 2020	Qualitative	Susan L. Luck and Stephanie Swartz	The Textbook Didn't Mention That: An Intercultural Experiential Exercise in Business Communication	U.S. and Germany
8	E	2020	Quantitative	Marisol J. C. Kevelson, Gabriele Marconi, Catherine M. Millett, and Nevena Zhelyazkova	College Educated yet Disconnected: Exploring Disconnection from Education and Employment in OECD Countries, with a Comparative Focus on the U.S. PERC Report and ETS Research Report Series No. RR-20-21	OECD/Germany/ US
9	E	2020	Qualitative	Andrea-Rosalinde Hofer, Aleksandra Zhivkovikj, and Roger Smyth	The Role of Labour Market Information in Guiding Educational and Occupational Choices. OECD Education Working Papers, No. 229	OECD
10	E	2020	Qualitative	Bridget Wibrow and Joanne Waugh	International Models to Rationalise VET Qualifications, Including Occupational Clusters: Case Studies -- Support Document	U.S. and Germany
12	E	2020	Qualitative	Jill Newton, Stephanie Oudghiri, Kathryn Obenchain, and JoAnn Phillion	Preservice Teachers' Understandings of Social Justice within the Context of Study Abroad Programs	U.S.
13	E	Oct 2019	Mixed method	Ervin Dimeny, Deborah Williamson, Lisa Yates, and David Hinson	Skilling Up: The Scope of Modern Apprenticeship	U.S.
15	E	2019	Qualitative	Ashleigh B. Thompson	Claiming a Pedagogy of Interruption through International Experiences	U.S. and Germany
16	E	2019	Mixed method	CEDEFOP	The Changing Nature and Role of Vocational Education and Training in Europe. Volume 7: VET from a Lifelong Learning Perspective: Continuing VET Concepts, Providers and Participants in Europe 1995-2015. Cedefop Research Paper No. 74	OECD
20	E	May 2018	Mixed method	Jorge Klor de Alva and Mark Schneider	Apprenticeships and Community Colleges: Do They Have a Future Together?	U.S.
22	E	2017	Mixed method	Heike Behle	Developing Vocational Competences during Secondary School?	Global
26	E	Nov 17, 2016	Qualitative	Gail Heriot	Apprenticeships: Useful Alternative, Tough to Implement. Policy Analysis No. 805	U.S. and Germany

Appendix A, cont.

No	Database	Publication date	Type of Research	Author/s	Title	Region/ Country
27	E	May 2016	Quantitative	Sebastiano Cincinnato, Bram De Wever, Hilde Van Keer, and Martin Valcke	The Influence of Social Background on Participation in Adult Education: Applying the Cultural Capital Framework	OECD/Germany/ US
28	E	2016	Qualitative	UNESCO-UIL	Literacy in Multilingual and Multicultural Contexts: Effective Approaches to Adult Learning and Education	Global
31	E	Jun 2015	Qualitative	Mafalda Carmo	END 2015: International Conference on Education and New Developments. Conference Proceedings. Porto, Portugal.	Global
33	E	2015	Qualitative	Dirk Van Damme	Global Higher Education in Need of More and Better Learning Metrics. Why OECD's AHELO Project Might Help to Fill the Gap	OECD
34	E	2015	Qualitative	Madhu Singh	Global Perspectives on Recognising Non-Formal and Informal Learning: Why Recognition Matters. Technical and Vocational Education and Training: Issues, Concerns and Prospects. Volume 21	Global
36	E	Apr 2013	Qualitative	K. Peter Kuchinke	Education for Work: A Review Essay of Historical, Cross-Cultural, and Disciplinary Perspectives on Vocational Education	U.S. and Germany
38	E	2013	Qualitative	CEDEFOP	Trainers in Continuing VET: Emerging Competence Profile	OECD
39	E	Nov 2012	Qualitative	Aisha Labi	Apprenticeships Make a Comeback in the United States	U.S.
40	E	Jul 2012	Qualitative	Justin J. W. Powell, Nadine Bernhard, and Lukas Graf	The Emergent European Model in Skill Formation: Comparing Higher Education and Vocational Training in the Bologna and Copenhagen Processes	OECD/Germany/ US
42	E	2012	Qualitative	Paulo Charles Pimentel Botas and Jeroen Huisman	(De)Constructing Power in Higher Education Governance Structures: An Analysis of Representation and Roles in Governing Bodies	OECD
45	E	Feb 2010	Qualitative	Gaoling Wu	The Inspiration Given by the Successful Practice of Development of Higher Vocational Education in the Developed Countries	U.S. and Germany
47	E	Nov 2009	Qualitative	Walther R. Heinz	Structure and Agency in Transition Research	U.S. and Germany

Appendix A, cont.

No	Data-base	Publica-tion date	Type of Research	Author/s	Title	Region/ Country
50	E	2009	Qualitative	Joachim Haas and Maurice Ourtau	Vocational Training and European Standardisation of Qualifications: The Case of Aircraft Maintenance	OECD
53	E	Aug 2007	Qualitative	Theodore Lewis	The Problem of Cultural Fit--What Can We Learn from Borrowing the German Dual System?	U.S. and Germany
55	E	Mar 2007	Qualitative	Martin Mulder, Tanja Wigel, and Kate Collins	The Concept of Competence in the Development of Vocational Education and Training in Selected EU Member States: A Critical Analysis	Germany
58	E	May 2004 - Aug 2004	Qualitative	Wolf-Dietrich Greinert	European Vocational Training "Systems"--Some Thoughts on the Theoretical Context of Their Historical Development	Germany
62	P	2010	Qualitative	Benjamin Kisang	The role of social networks in the adjustment and academic success of international students: A case study of a university in the Southwest	U.S.
63	C	2005	Qualitative	UNESCO-UNEVOC	Orientating technical and vocational education and training (TVET) for sustainable development	Global

STAKEHOLDERS' PERCEPTIONS OF CAREER AND TECHNICAL EDUCATION

Oscar A. Aliaga

ABSTRACT

This study reports stakeholders' perceptions of Career and Technical Education (CTE) in a northern state in the United States. Secondary data was used with a total of 1,472 respondents, and participants were grouped in 13 categories of stakeholders. Results show positive perceptions in the six areas in which questions were grouped according to the value of CTE: Relevance of academic content; Impact on postsecondary academic options; Work preparation relevance; Value of work-related learning; Support and advice to engage and enroll in CTE; and CTE societal role. ANOVA analyses were conducted to explore differences between groups, and our analyses confirmed that differences in perceptions existed between the groups of stakeholders. The impact of socioeconomic status (Income) on perceptions for each item in the survey was further explored with Univariate Analysis of Variance, using role or stakeholder as the covariate. Results show Income as a predictor of perceptions in a five items after controlling for Role: 1) accessibility of industry-specific equipment, 2) involvement of industry and employers in CTE, 3) development of work-based learning, 4) students being prepared to obtain industry-recognized credentials, and 5) middle school counselor use CTE centers as resources. This study is one of the few conducted in the country with a comprehensive group of stakeholders regarding perceptions on the value of CTE, a major debated topic in education.

Key Words: *Career and Technical Education, vocational education system, constructivist, socioeconomic*

INTRODUCTION

Career and technical education (CTE) has changed significantly over the past two decades, as it has become a system that prepares students "concomitantly for employment and higher education." (Lynch, 2000, p. 158) and, in doing has responded to the changing workforce dynamics in the modern world. Those features have increasingly brought CTE into the limelight (Plasman et al., 2017) and interest in CTE have persisted. Eighty-three percent of all students in the class of 2013 took one or more CTE credits, and they took an average of 2.95 credits in combined CTE courses (own calculations).

Have those changes translated into positive perceptions of CTE? Has the model shift resulted in a favorable opinion of CTE as a valued educational option? After all these years, it is legitimate to ask how we now perceive CTE. Negative views appear to have persisted: CTE is still seen as the old vocational education system with a curriculum leading to occupation preparation only and, therefore, with no option for postsecondary education (Withington et al., 2012; Wonacott, 2000). To enhance the positive aspects of CTE, policies, state practices, and other efforts have been undertaken (Advance CTE, 2021) to address the stigma associated with this educational approach and the idea that CTE is a system available only for those students that cannot perform academically (Harris & Wakelyn, 2007).

Purpose and Research Questions

This study aimed to provide a comprehensive view of those perceptions and whether differences exist among students, families, teachers, administrators, and other stakeholders. Although several studies have been conducted in this area, they relate to specific sectors or groups (for example, school counselors; see Finlayson, 2009). This study explored perceptions of CTE from the perspective of multiple stakeholders, with the expectation that such knowledge will help policymakers and school administrators in their decision-making process regarding CTE and its benefits.

The research questions in this study are:

1) What are the current perceptions of CTE?
2) Are there any differences among stakeholders about perceptions of CTE?
3) Are there any differences in the perceptions of CTE based on the stakeholders' socioeconomic status and role?

Conceptual Framework: Understanding Perceptions of CTE from a Historical Perspective

The two models of CTE provided the context for the discussion about perceptions.

The Old Model: The Vocational Education System

It is argued that negative perceptions of CTE stem from the old CTE model created by the Smith-Hughes Act and existed for most of the 20th century. Those perceptions may have remained a widespread view of parents, teachers, policymakers, and others (Elliott & Deimler,

2007). Two issues from the old model are critical to understanding negative perceptions of CTE.

The first one is the establishment of a separate system and curriculum. The Smith-Hughes Act (1917) funded vocational education in public schools in the United States "as a separate and distinct 'system' of education" (Rojewski, 2002, p. 6), establishing a separate curriculum that emphasized the preparation for work in detriment of a standard academic preparation (Rojewski, 2002). With the definition of an education path conducive primarily and, in practical terms, exclusively to employment, the view of vocational education precluding the option of seeking a postsecondary degree remained ingrained in the country's culture.

The second one was the participating student population. Vocational education became the "dumping ground" for students considered less able and underperforming (Stone & Aliaga, 2003), a practice further exacerbated by intentional tracking and other practices and by the placing in CTE courses students with disabilities and English language learners. Perkins legislation starting in 1984, had targeted specific groups of students and called for equal access for disadvantaged students and other special populations (Castellano et al., 2002). While that purpose was altruistic and brought more equity to education, it was still perceived as a negative feature of the CTE education system.

The New Model: The School Reform-Induced Changes in CTE

During the last quarter of the 20th century, changes were introduced in CTE in the context of the comprehensive school reform. They included measures in three areas, shaping a new CTE model.

First, the academic content across all schools was increased, which also impacted students enrolled in CTE programs. Second, because of declining enrollment in vocational education, "the vocational education community felt pressure to adapt to new demands or risk becoming irrelevant" (Castellano et al., 2003, p. 244), leading to changes to elevate the academic content of CTE courses. Third, program designs that were specific to CTE were introduced, including Tech-Prep, School-to-Work, career academies, career magnets (Castellano et al., 2003), career pathways (Symonds et al., 2011), and the career clusters approach. At their core, those changes sought to prepare CTE students for both an occupation and postsecondary education (Lynch, 2000) and became the most significant shift in CTE in over a century.

CTE has continued to evolve with broader and deeper content and has a significant positive impact on students. Among all high school graduates of 2013, 80.7% took at least one Carnegie Unit (one credit) in CTE (National Center for Education Statistics [NCES], 2013). College enrollment figures for 2013 indicate that over 70% of students taking 2 or 3 CTE credits in high school enrolled in postsecondary degrees or certificates within three years (Hinz & Luff, 2020; see also Hudson, 2017). By 2016, among those 2013 high school graduates who took three or more CTE credits and were not enrolled in postsecondary education, their unemployment rate was 11%, compared to 23% among those who took no CTE credits in high school (Holzwart & Liu, 2020).

Constructivist Approach to Perceptions

According to the constructivist theory of perceptions, perception is an indirect multistage process with mediational operations intervening between stimulation and percept (Norman, 2002). For perception to happen, "memory, stored schemata, and past experience play an important role" (p. 74). Perceptions of CTE are based on incomplete or outdated versions of the CTE system, based on prior experience or knowledge (the schemata) and limited information. "The constructivists see the stimulation reaching our senses as inherently insufficient, necessitating an 'intelligent' perceptual system that relies on inferential types of mechanisms to overcome this inherent equivocality of stimulation" (p. 74).

Constructivist theories of perception also indicate that "perception involves an interpretation of the outside world, not just a receiving or beholding of it, and that motor behavior, 'feedforward,' and efferent feedback are requisite factors" (Norberg, 1978, p. 7). This feature of the theory can help understand related negative attitudes towards CTE—social stigma and practices that restrict access to CTE.

The constructivist theory of perception allows us to understand perceptions under the old (vocational) model and any potential change toward the new (CTE) model. It helps us understand how prior knowledge of past models shapes those perceptions and how it is possible for people to continue having those perceptions of CTE, regardless of changes, based on how CTE resembles the old model. Those perceptions were expected to change as more rigorous academics were introduced, and better preparation for work became regular feature of CTE.

STUDYING PERCEPTIONS OF CTE

Negativity Regarding CTE

There have always been negative perceptions of CTE. Urich and MacKenzie (1985) saw students' vocational education enrollment as detrimental to academic options. Others questioned the efficacy of CTE as a system, which Semple (1986) summarized as follows: "Virtually all the evidence shows that whatever measure is used—future earnings, job placement, job relatedness—vocational education is meeting neither the needs of students nor those of the nation's employers" (p. 70). Losh and Yates (1994), in turn, noted that "one of the major challenges facing technical education is a perception, deserved or otherwise, that programs are not providing 'world class' employees" (p. 1).

Many have "continued to view CTE as inferior to a traditional academic path" (Little Hoover Commission, 2007, p. 15), of lesser educational value (Cohen & Besharov, 2002; Fain, 2017), and thus available as a last resort to underperforming students (Harris & Wakelyn, 2007; Stipanovic & Stringfield, 2013; Wells, 1999).

Research on Perceptions of CTE

One recent study about perceptions of CTE was conducted by Advance CTE (2021). It analyzes the experience of families and students currently enrolled in CTE and provides insights on what families value in their education; analyzes what aspects and messages about CTE resonate with

them and the go-to messengers, and identifies equity gaps and message tailoring to reach each learner.

Existing research has focused on specific areas of CTE with mixed results. Gaunt (2005) conducted a study with seniors in Michigan and found that there was no difference between CTE and non-CTE students in their perception that CTE is designed for those who plan to go to work immediately after high school, is designed for those who struggle academically, and that CTE is designed for students of all ability levels.

In her study in Los Angeles, St. Gean (2010) reported that students perceived CTE courses were for all students and students who struggle academically. Jimoh (2014) researched perceptions of CTE in two technical high schools in Missouri, reporting that participants had positive perceptions of CTE in terms of career preparation, preparation for college, as well as gaining practical experience, which included "getting a head start on certifications, practical skills, and hands-on experiences" (p. 57). Smith (2015) conducted research with 12th-grade African-American CTE students in rural areas of South Carolina and reported that "all students had a sense of future orientation and cited this as a reason" to enroll in CTE (p. 56).

In a study involving school counselors, Finlayson (2009) found that "overall, CTE was viewed by both middle school and high school counselors as important to students' education" (p. 49), while Thornburg (2016) studied whether school counselors' knowledge level and background were related to their perceptions of CTE and found that counselors' knowledge level was associated with perceptions of CTE.

Research by Herian (2010) and Coleman (2005) are perhaps two of the few that included multiple stakeholders' perceptions of CTE. Herian's study in Nebraska showed the public had positive perceptions about CTE courses and their applicability to the current economy, indicating that CTE prepared students for career and college—although they recognized CTE students were not as respected as academic students. Herian also found that "general attitudes about career preparation were positive" (pp. 2-3). Interestingly, respondents with children usually held a more positive perception of CTE. Coleman conducted his research with registered voters and CTE teachers in Alabama. Although both groups agreed about the importance of offering CTE, teachers thought it more beneficial than voters to offer CTE to college-bound and noncollege-bound students, higher performing students, and students with learning disabilities.

Socioeconomic Status and Perceptions of CTE

Research on participation in vocational education indicates an association with families' socioeconomic status, reflecting a reality that has for years been addressed by Perkins legislation. The basic proposition is that the lower the family's socioeconomic status, the more likely the participation in CTE (Castellano et al., 2002), including students in rural areas and poor urban sectors. This link reinforces negative perceptions about CTE (see Herian, 2010). Agodini et al. (2004) found that "students from families in the lowest socioeconomic quartile were 14 percentage points more likely to participate in vocational education than students from families in the highest socioeconomic quartile" (p. 6). In turn, Aliaga and Dickinson (2012)

found that on average "students in the highest CTE involvement group tended to have lower socioeconomic status indexes and lower grade point averages" (p. 6).

DATA AND METHOD

This quantitative, correlational study sought to evaluate potential explanations for the relationships between stakeholders regarding their perceptions of CTE (Bordens & Abbott, 2011; Gay et al., 2012). As such, I used this approach to understand if the variables were related, and the magnitude and directions of that relationship (Lodico et al., 2006)

Data

In this study, I used secondary data from a northern state. Data had been collected as part of a broader effort to inform possible revisions and improvements in that state's CTE system at the secondary level. Data were compiled by the Education department, using a non-random online survey run by and available through its website. The instrument had 20 Likert-type scale questions related to perceptions of CTE that were grouped into six categories, described in Table 1. The overall response was N=1,472. However, depending on the variable, the actual n varies, thus limiting the usable number of responses.

Table 1. *Variable Groups*

Group	No. of Items	Item Sample
Relevance of Academic Content	5	CTE programs integrate challenging mathematics content
Impact on Postsecondary Academic Options	2	Students in CTE are prepared for postsecondary education and to obtain a college degree
Work Preparation Relevance	4	In regional technical centers, students have access to modern, industry specific equipment to learn needed tech skills
Value of Work-Related Learning	2	CTE centers have developed strong work-based learning programs for CTE students
Support and Advice to Engage and Enroll in CTE	4	Parents are supportive of their children enrolling in CTE courses or programs
CTE Societal Role	3	CTE programs are an avenue to the middle class for students living in or raised in poverty

The reported population of interest was stakeholders of the state's career and technical education secondary system (Avci et al., 2015; Moore et al., 2006; Zion, 2009). Participating stakeholders were grouped into thirteen categories according to their relationship with the state's CTE system (Table 2).

Table 2. *Respondents Role/Frequency Distribution*

	Frequency	Percent
Current High School Student	269	18.3
Parent / Guardian / Family	164	11.1
Classroom Teacher	283	19.2
Non-Classroom Teacher (Counselor, Special Education, Work-Based Learning, Other)	197	13.4
School / System Administration	153	10.4
Recent High School Graduate	10	0.7
College Student	48	3.3
Post-Secondary Entity	52	3.5
Engaged Citizen/Community Member	149	10.1
Local Business Leader/Partner	26	1.8
Community/Non-profit/Non-government Organization	56	3.8
Government/Workforce Entity	42	2.9
Elected Official	23	1.6
Total	1472	100.0

This study's data analysis focused on three main aspects: the overall perceptions about CTE for which basic descriptive statistics were used. Next, differences in perception between stakeholders were explored using analysis of variance. The final part included a univariate analysis of variance about whether the respondents' socioeconomic status influenced those perceptions.

Results

Table 2 shows that the two largest groups of participants were "Classroom Teacher" and "Current High School Student," arguably the primary stakeholders. The second most prominent groups of respondents were "Non-Classroom Teachers (Counselors and others)," "School/System Administration," and "Engaged Citizen/Community Leader." The "Elected Official" group and respondents in the "Local Business Leader/Partner" group were small in number, notwithstanding that they are significant stakeholders whose views of CTE are essential for a system that actively engages them.

Overall Perceptions

Table 3 reports the descriptive statistics for all groups. Regarding "Relevance of academic content," the score mean across groups is encouraging: answers lean above the mid-point of the continuum. In other words, the different stakeholders positively perceive the value of CTE and its impact on students' academic development.

Respondents also perceived CTE as having a positive "Impact of postsecondary academic options." This is also reassuring as changes are taken in programs that may lead to a postsecondary degree.

Table 3. *Overall Descriptive Statistics*

	N	Range	Mean	Std. Deviation
Relevance of Academic Content				
CTE programs integrate challenging mathematics content	852	4	3.43	1.050
CTE programs integrate challenging science content	851	4	3.60	1.009
CTE programs integrate challenging English content.	706	4	3.27	1.073
CTE centers provide rigorous and challenging learning options for all students	913	4	3.52	1.176
Students in CTE programs are as academically well prepared as their peers in non-CTE programs	793	4	3.45	1.154
Impact on Postsecondary Academic Options				
Exposure to CTE in HS influences a student's decision about post-secondary educational choices	891	4	4.21	0.724
Students in CTE are prepared for postsecondary education and to obtain a college degree	794	4	3.73	0.977
Work Preparation Relevance				
Middle & high schools, and technical centers have clear, structured, and easily understood paths to sustainable employment & continue education opportunities	859	4	3.03	1.126
Standards for CTE programs are up to date and reflect the requirements of a 21st century workplace	663	4	3.42	1.088
In regional technical centers, students have access to modern, industry specific equipment to learn needed tech skills	804	4	4.04	0.841
Industry and employers are actively involved in the CTE programs	713	4	3.60	1.006
Value of Work-Related Learning				
CTE centers have developed strong work-based learning programs for CTE students	720	4	4.01	0.884
Students in career pathways and CTE programs are well prepared to obtain an industry-recognized credential.	814	4	4.00	0.803
Support and Advice to Engage and Enroll in CTE				
Parents are supportive of their children enrolling in CTE courses or programs	827	4	3.65	0.917
High school counselors are well informed and knowledgeable about CTE programs and entry requirements	842	4	3.07	1.214
School counselors and other adults advising students in grades 7-12 are familiar with their regional CTE center and the programs offered there	811	4	3.02	1.126
Middle school counselors use CTE centers as resources in career education for students	596	4	2.39	1.003
CTE Societal Role				
CTE programs are an avenue to the middle class for students living in or raised in poverty	882	4	3.90	0.962
The purpose of career technical education centers is to provide opportunities to students who are not successful in high school	1069	4	2.08	1.119
CTE programs are an avenue to retain at risk students	788	4	3.97	0.980

Positive perception scores were found about how programs are articulated to prepare students for work ("Work preparation relevance"), with most items showing a positive perception in this category. However, the highest means were related to the "Value of work-related learning," which is not surprising, given the wide use of hands-on, applied learning, and work-based learning to support CTE students' education. Responses also indicated a positive perception of the articulation of CTE programs with other sectors of society, particularly with businesses. The only low mean in this group corresponded to the perception of how CTE has structured paths in middle and high schools ("Middle & high schools, and technical centers have clear, structured, and easily understood paths to sustainable employment & continue education opportunities").

The group of questions labeled "Support and advice to engage and enroll in CTE" relates to support for students' enrollment in CTE. Stakeholders perceived that Parents mainly support their children enrolling in CTE courses and programs. However, the stakeholders' perceptions of middle and high school counselors' role in engaging students in CTE were less optimistic. Perceptions about knowledge counselors have of CTE were also negative. This area requires more work in high schools, as "only 27 percent of middle school counselors report that they connect students with CTE coursework or career pathways" (Advance CTE & American School Counselor Association 2018, p. 15).

The final group of questions, "CTE societal role," showed positive perceptions about the role CTE plays in society, although stakeholders perceived negatively the CTE purpose of providing opportunities to students who are not successful in school, matching in that sense a long-held view of CTE.

Table 4. *Responses Means by Respondent Role*

	Respondents Roles				
	1	2	3	4	5
Relevance of Academic Content					
CTE programs integrate challenging mathematics content	3.18	3.81	3.49	3.52	3.22
CTE programs integrate challenging science content	3.42	3.93	3.68	3.66	3.47
CTE programs integrate challenging English content.	---	3.64	3.31	3.29	2.97
CTE centers provide rigorous and challenging learning options for all students	3.16	3.78	3.76	3.60	3.50
Students in CTE programs are as academically well prepared as their peers in non-CTE programs	---	3.84	3.39	3.38	3.34
Impact on Postsecondary Academic Options					
Exposure to CTE in HS influences a student's decision about post-secondary educational choices	3.92	4.37	4.34	4.24	4.21
Students in CTE are prepared for postsecondary education and to obtain a college degree	3.56	4.05	3.88	3.77	3.56
Work Preparation Relevance					
Middle & high schools, and technical centers have clear, structured, and easily understood paths to sustainable employment & continue education opportunities	3.52	3.18	2.98	2.91	2.79
Standards for CTE programs are up to date and reflect the require-ments of a 21st century workplace	---	3.62	3.36	3.70	3.30
In regional technical centers, students have access to modern, indus-try specific equipment to learn needed tech skills	3.77	4.04	4.26	4.23	4.25
Industry and employers are actively involved in the CTE programs	---	3.75	3.66	3.60	3.53
Value of Work-Related Learning					
CTE centers have developed strong work-based learning programs for CTE students	---	4.10	4.04	4.10	3.94
Students in career pathways and CTE programs are well prepared to obtain an industry-recognized credential.	3.74	4.13	4.10	4.16	4.08
Support and Advice to Engage and Enroll in CTE					
Parents are supportive of their children enrolling in CTE courses or programs	3.84	4.09	3.50	3.63	3.53
High school counselors are well informed and knowledgeable about CTE programs and entry requirements	3.68	2.99	2.88	3.23	3.11
School counselors and other adults advising students in grades 7-12 are familiar with their regional CTE center and the programs offered there	3.49	2.89	2.86	3.16	2.94
Middle school counselors use CTE centers as resources in career education for students	---	2.38	2.44	2.53	2.32
CTE Societal Role					
CTE programs are an avenue to the middle class for students living in or raised in poverty	3.48	3.87	4.05	4.13	3.81
The purpose of career technical education centers is to provide op-portunities to students who are not successful in high school	2.73	2.03	1.96	2.11	1.68
CTE programs are an avenue to retain at risk students	---	3.95	4.01	4.08	3.93

1=Current High School Student
2=Parent/Guardian/Family
3=Classroom Teacher
4=Non-classroom Teacher (Counselor, Special Education, Work-Based Learning, Other)
5=School/System Administration

(Ctd.)

Table 5. *Cont.*

	Respondents Roles							
	6	7	8	9	10	11	12	13
Relevance of Academic Content								
CTE programs integrate challenging mathematics content	4.00	3.69	2.66	3.46	3.57	3.38	3.56	3.69
CTE programs integrate challenging science content	4.00	3.77	2.97	3.58	3.79	3.52	3.42	3.87
CTE programs integrate challenging English content.	---	3.77	2.65	3.23	3.29	3.25	3.21	3.35
CTE centers provide rigorous and challenging learning options for all students	3.75	3.86	2.95	3.39	3.23	3.34	3.63	3.63
Students in CTE programs are as academically well prepared as their peers in non-CTE programs	---	3.71	3.08	3.42	3.50	3.42	3.32	3.89
Impact on Postsecondary Academic Options								
Exposure to CTE in HS influences a student's decision about post-secondary educational choices	4.75	4.33	4.06	4.13	4.27	4.18	4.22	4.33
Students in CTE are prepared for postsecondary education and to obtain a college degree	4.75	4.46	3.43	3.49	3.83	3.33	3.41	3.93
Work Preparation Relevance								
Middle & high schools, and technical centers have clear, structured, and easily understood paths to sustainable employment & continue education opportunities	3.00	3.94	2.31	2.93	2.85	2.92	2.75	2.88
Standards for CTE programs are up to date and reflect the requirements of a 21st century workplace	---	4.00	3.36	3.21	3.50	3.29	2.79	3.06
In regional technical centers, students have access to modern, industry specific equipment to learn needed tech skills	4.25	4.08	3.93	3.73	3.55	3.82	3.63	3.76
Industry and employers are actively involved in the CTE programs	---	3.92	3.69	3.39	3.50	3.48	3.60	3.56
Value of Work-Related Learning								
CTE centers have developed strong work-based learning programs for CTE students	---	4.43	3.88	3.85	3.79	4.17	3.68	4.00
Students in career pathways and CTE programs are well prepared to obtain an industry-recognized credential.	4.25	4.38	3.79	3.79	3.69	4.12	3.77	3.94
Support and Advice to Engage and Enroll in CTE								
Parents are supportive of their children enrolling in CTE courses or programs	4.50	3.92	3.00	3.61	3.73	3.57	3.33	3.50
High school counselors are well informed and knowledgeable about CTE programs and entry requirements	2.75	3.33	2.43	2.70	2.86	3.09	3.06	2.50
School counselors and other adults advising students in grades 7-12 are familiar with their regional CTE center and the programs offered there	2.50	2.91	2.97	2.75	2.75	3.23	3.06	2.88
Middle school counselors use CTE centers as resources in career education for students	---	2.45	2.32	2.30	2.45	2.21	2.33	2.20
CTE Societal Role								
CTE programs are an avenue to the middle class for students living in or raised in poverty	2.67	3.46	3.81	3.85	4.20	4.04	4.00	4.21
The purpose of career technical education centers is to provide opportunities to students who are not successful in high school	1.60	2.59	1.60	2.11	2.22	1.85	1.76	1.85
CTE programs are an avenue to retain at risk students	---	3.23	4.03	3.88	3.80	4.08	3.86	4.16

6=Recent High School Graduate
7=College Student
8=Post Secondary Entity
9=Engaged Citizen/Community Member
10=Local Business Leader/Partner
11=Community/Non-profit/Non-government Organization
12=Government/Workforce Entity
13=Elected Official

$p<.05$

Perceptions by Stakeholders Type

Parents had the highest positive perception scores in most categories, followed by College students (Table 4). Regarding the "Relevance of academic content," Parents had the highest average across all items. They were followed by Recent high school graduates and College students. These latter groups also had the highest scores in perceptions regarding the "Impact on postsecondary academic options" category. College students also had positive perceptions regarding "Work preparation relevance," followed by Parents and those in a Government/ Workforce entity. Perceptions of the latter are essential because they have the perspective of the workforce system and job needs. In the "Value of work-related learning" category, all stakeholders had positive scores, agreeing on the strength of work-based learning available in CTE and the preparation CTE students receive to obtain industry-recognized credentials. Mostly all respondents had positive perceptions about CTE being an avenue for social mobility.

The question about whether CTE has the purpose of providing opportunities for students who are not successful in high school is particularly interesting: The highest scores, in this case, came from Parents, but also from current College students, which is vital to consider since they have a vested interest in looking at CTE as a viable option for students. On the other side, those who did not perceive CTE as an opportunity for unsuccessful students are Recent high school graduates and representatives from Postsecondary entities (colleges and universities). This is a result that indeed requires further exploration.

The Elected official's group perception of whether CTE can help retain at-risk students is critical. This is informative since they are a stakeholder group concerned with potential educational and CTE policies. On the other hand, the group that does not see it that way is the College student group.

Analysis of Perceptions between Groups

An Analysis of Variance (ANOVA) was conducted to explore differences in stakeholders' perceptions of CTE. Because the assumption of normality was not met for some of the variables, both Levene's test and the Welch statistic were used.

Table 5. *Analysis of Variance. Between Group Statistics, by Role (All Respondents)*

	Sum of Squares	df	*F*	Sig.	Levene's Test-Sig.	Welch Test Sig.
Relevance of Academic Content						
CTE programs integrate challenging mathematics content	51.624	12	4.070	0.000	0.000	---
CTE programs integrate challenging science content	34.295	12	2.880	0.001	0.000	---
CTE programs integrate challenging English content	38.025	10	3.415	0.000	0.309	0.001
CTE centers provide rigorous and challenging learning options for all students	55.485	12	3.450	0.000	0.000	0.000
Students in CTE programs are as academically well prepared as their peers in non-CTE programs	29.649	10	2.263	0.013	0.000	0.016
Impact on Postsecondary Academic Options						
Exposure to CTE in HS influences a student's decision about post-secondary educational choices	19.506	12	3.196	0.000	0.105	0.003
Students in CTE are prepared for postsecondary education and to obtain a college degree	45.104	12	4.127	0.000	0.004	0.000
Work Preparation Relevance						
Middle & high schools, and technical centers have clear, structured, and easily understood paths to sustainable employment & continue education opportunities	73.733	12	5.124	0.000	0.000	0.000
Standards for CTE programs are up to date and reflect the requirements of a 21st century workplace	31.728	10	2.753	0.002	0.001	0.001
In technical centers, students have access to modern, industry specific equipment to learn needed tech skills	42.324	12	5.303	0.000	0.161	0.000
Industry and employers are actively involved in the CTE programs	9.317	10	0.919	0.515	0.051	0.440
Value of Work-Related Learning						
CTE centers have developed strong work-based learning programs for CTE students	11.302	10	1.455	0.152	0.741	0.021
Students in career pathways and CTE programs are well prepared to obtain an industry-recognized credential	24.721	12	3.305	0.000	0.367	0.001
Support and Advice to Engage and Enroll in CTE						
Parents are supportive of their children enrolling in CTE courses or programs	47.162	12	4.943	0.000	0.004	0.000
High school counselors are well informed and knowledgeable about CTE programs and entry requirements	88.993	12	5.347	0.000	0.000	0.000
School counselors and other adults advising students in grades 7-12 are familiar with their regional CTE center and the programs offered there	45.587	12	3.087	0.000	0.000	0.000
Middle school counselors use CTE centers as resources in career education for students	4.623	10	0.455	0.918	0.002	0.886
CTE Societal Role						
CTE programs are an avenue to the middle class for students living in or raised in poverty	42.768	12	4.005	0.000	0.000	0.000
The purpose of career technical education centers is to provide opportunities to students who are not successful in high school	111.373	12	7.997	0.000	0.039	0.000
CTE programs are an avenue to retain at risk students	11.969	10	1.251	0.255	0.062	0.496

$p < .05$

Table 5 shows a statistically significant difference in the perceptions means between all groups at the p <.05 level for most items, with four exceptions. The first item with no statistical difference was "CTE programs are an avenue to retain at-risk students," a statement that received a high score from all respondents. This perception may well relate to the view of the old CTE model but, at the same time, could support the argument that CTE is seen as the principal education setting to help at-risk students (Castellano et al., 2002).

The second not statistically significant item is about the role of middle school counselors ("Middle school counselors use CTE centers as resources in career education for students"). Recent research shows that only three percent of students in ninth grade in 2009 indicated that counselors influenced their career decisions (Oymark, 2018).

The third item with no statistical differences in perception scores was whether "Industry and employers are actively involved in the CTE programs." This is intriguing since business and industry representatives regularly participate in the CTE program advisory boards, as required. Fourth, stakeholders appear to agree regarding CTE using work-based learning approaches to improve the students' learning.

With such a disparity of roles and the difference in perceptions between stakeholders, another step was taken to analyze their differences by clustering them in smaller groups based on their connection to CTE: a) Current high school students, and Parents; b) School staff and administrators, and c) all other stakeholders.

Table 6. *Analysis of Variance. Between Group Statistics, Students and Parents*

	Sum of Squares	df	*F*	Sig.	Levene's Test-Sig.	Welch Test Sig.
Relevance of Academic Content						
CTE programs integrate challenging mathematics content	22.188	1	27.766	0.000	0.505	0.000
CTE programs integrate challenging science content	14.180	1	19.305	0.000	0.320	0.000
CTE programs integrate challenging English content	---	---	---	---	---	---
CTE centers provide rigorous and challenging learning options for all students	22.280	1	21.156	0.000	0.377	0.000
Students in CTE programs are as academically well prepared as their peers in non-CTE programs	---	---	---	---	---	---
Impact on Postsecondary Academic Options						
Exposure to CTE in HS influences a student's decision about post-secondary educational choices	11.081	1	19.703	0.000	0.814	0.000
Students in CTE are prepared for postsecondary education and to obtain a college degree	12.365	1	16.559	0.000	0.864	0.000
Work Preparation Relevance						
Middle & high schools, and technical centers have clear, structured, and easily understood paths to sustainable employment & continue education opportunities	6.407	1	6.333	0.013	0.000	0.018
Standards for CTE programs are up to date and reflect the require-ments of a 21st century workplace	---	---	---	---	---	---
In technical centers, students have access to modern, industry specif-ic equipment to learn needed tech skills	3.705	1	5.400	0.021	0.646	0.024
Industry and employers are actively involved in the CTE programs	---	---	---	---	---	---
Value of Work-Related Learning						
CTE centers have developed strong work-based learning programs for CTE students	---	---	---	---	---	---
Students in career pathways and CTE programs are well prepared to obtain an industry-recognized credential	7.648	1	12.731	0.000	0.780	0.001
Support and Advice to Engage and Enroll in CTE						
Parents are supportive of their children enrolling in CTE courses or programs	3.490	1	4.770	0.030	0.404	0.035
High school counselors are well informed and knowledgeable about CTE programs and entry requirements	25.790	1	20.490	0.000	0.004	0.000
School counselors and other adults advising students in grades 7-12 are familiar with their regional CTE center and the programs offered there	17.845	1	17.403	0.000	0.013	0.000
Middle school counselors use CTE centers as resources in career education for students	---	---	---	---	---	---
CTE Societal Role						
CTE programs are an avenue to the middle class for students living in or raised in poverty	7.947	1	7.585	0.006	0.463	0.006
The purpose of career technical education centers is to provide op-portunities to students who are not successful in high school	33.237	1	25.709	0.000	0.004	0.000
CTE programs are an avenue to retain at risk students	---	---	---	---	---	---

Current Students and Parents

Parents had more positive perceptions in almost all aspects of CTE than Current students (Table 6), including Academic content and CTE Impact on postsecondary academic options. There are a couple of items where Current students had a more positive perception than Parents: information "High school counselors have about CTE" and "School counselors and other adults familiarity with CTE centers." Also, in this category, Parents had a more positive perception than Current students of their support for their children's enrollment in CTE. One exciting item relates to "CTE societal role": Students had higher scores than parents in their perception of CTE providing opportunities to students who are not successful in high school.

School Professional Staff

ANOVA analysis for the stakeholders in the group of School Professional Staff showed statistical significance in the question of whether "CTE programs integrate challenging English content" (Table 7). Using the least significant difference method for multiple comparisons, it was found that the School/System administrators group had a less positive perception than Classroom teachers and Non-classroom teachers. School and System administrators also had a lower perception than Classroom teachers on whether CTE students are prepared for postsecondary education and to obtain a college degree. Further research is needed to explore the perceptions of School administrators (principals and CTE directors) and the difference with those of System administrators (e.g., district superintendents) regarding this issue. Is it that *non-CTE* administrators have remained engulfed in the idea of the old CTE, and therefore interventions are needed to change their knowledge and perceptions?

Table 7. *Analysis of Variance. Between Groups Statistics, School Professional Staff (e.g., Classroom Teachers, Counselors, Special Education Managers, Work-Based Coordinators, School Administrators)*

	Sum of Squares	df	*F*	Sig.
Relevance of Academic Content				
CTE programs integrate challenging mathematics content	6.226	2	2.585	0.077
CTE programs integrate challenging science content	3.107	2	1.345	0.262
CTE programs integrate challenging English content	8.429	2	3.485	0.032
CTE centers provide rigorous and challenging learning options for all students	4.872	2	1.653	0.193
Students in CTE programs are as academically well prepared as their peers in non-CTE programs	0.207	2	0.072	0.930
Impact on Postsecondary Academic Options				
Exposure to CTE in HS influences a student's decision about post-secondary educational choices	1.399	2	1.465	0.232
Students in CTE are prepared for postsecondary education and to obtain a college degree	6.304	2	3.179	0.043
Work Preparation Relevance				
Middle & high schools, and technical centers have clear, structured, and easily understood paths to sustainable employment & continue education opportunities	2.434	2	0.909	0.404
Standards for CTE programs are up to date and reflect the requirements of a 21st century workplace	10.314	2	4.228	0.015
In technical centers, students have access to modern, industry specific equipment to learn needed tech skills	0.063	2	0.056	0.946
Industry and employers are actively involved in the CTE programs	1.068	2	0.483	0.617
Value of Work-Related Learning				
CTE centers have developed strong work-based learning programs for CTE students	1.382	2	0.854	0.426
Students in career pathways and CTE programs are well prepared to obtain an industry-recognized credential.	0.415	2	0.336	0.715
Support and Advice to Engage and Enroll in CTE				
Parents are supportive of their children enrolling in CTE courses or programs	1.327	2	0.832	0.436
High school counselors are well informed and knowledgeable about CTE programs and entry requirements	10.235	2	3.272	0.039
School counselors and other adults advising students in grades 7-12 are familiar with their regional CTE center and the programs offered there	6.796	2	2.396	0.092
Middle school counselors use CTE centers as resources in career education for students	2.100	2	0.924	0.398
CTE Societal Role				
CTE programs are an avenue to the middle class for students living in or raised in poverty	6.186	2	3.760	0.024
The purpose of career technical education centers is to provide opportunities to students who are not successful in high school	12.677	2	5.596	0.004
CTE programs are an avenue to retain at risk students	1.315	2	0.711	0.492

Non-classroom teachers had a more positive perception than Classroom teachers and School/ System administrators on whether "CTE standards were up to date." Also, Non-classroom teachers (including counselors and Special Education managers) had a more positive perception of counselors' knowledge of CTE than the other two groups.

School and System administrators had a more negative perception than Classroom teachers and Non-classroom teachers about CTE being an avenue to the middle class for students living in poverty. Also, those in an Administration role perceived CTE more negatively as a system providing an opportunity for students not successful in high school.

Other Roles

Table 8 shows ANOVA results for Other stakeholders and the items with differences in their perception scores. Two of them refer to the integration of Challenging mathematics and science concepts in CTE programs, with representatives of Postsecondary institutions showing negative perceptions compared to all other groups (except Elected officials in the case of science concepts). This perception calls for deeper analysis for two main reasons: one, representatives of colleges and universities usually have direct corroborating information about the performance of students coming from CTE programs. Two, because of the potential bias university and college administrators may have towards the CTE curriculum and the potential bias in the college admission process of CTE students. CTE administrators have anecdotally shared this latter explanation.

Table 8. *Analysis of Variance. Between Group Statistics, All Other Roles*

	Sum of Squares	df	*F*	Sig.	Levene's Test-Sig.	Welch Test Sig.
Relevance of Academic Content						
CTE programs integrate challenging mathematics content	22.602	7	3.092	0.004	0.002	---
CTE programs integrate challenging science content	15.014	7	2.276	0.030	0.003	---
CTE programs integrate challenging English content	14.354	6	2.394	0.030	0.608	0.111
CTE centers provide rigorous and challenging learning options for all students	14.241	7	1.487	0.173	0.000	0.146
Students in CTE programs are as academically well prepared as their peers in non-CTE programs	10.263	6	1.444	0.199	0.032	0.335
Impact on Postsecondary Academic Options						
Exposure to CTE in HS influences a student's decision about post-secondary educational choices	3.044	7	0.845	0.551	0.178	0.398
Students in CTE are prepared for postsecondary education and to obtain a college degree	21.493	7	3.338	0.002	0.003	0.000
Work Preparation Relevance						
Middle & high schools, and technical centers have clear, structured, and easily understood paths to sustainable employment & continue education opportunities	27.939	7	3.561	0.001	0.007	0.000
Standards for CTE programs are up to date and reflect the requirements of a 21st century workplace	12.234	6	1.878	0.087	0.007	0.024
In technical centers, students have access to modern, industry specific equipment to learn needed tech skills	3.909	7	0.658	0.707	0.193	0.822
Industry and employers are actively involved in the CTE programs	4.573	6	0.815	0.559	0.262	0.509
Value of Work-Related Learning						
CTE centers have developed strong work-based learning programs for CTE students	7.182	6	1.781	0.105	0.789	0.010
Students in career pathways and CTE programs are well prepared to obtain an industry-recognized credential.	6.970	7	1.517	0.163	0.224	0.218
Support and Advice to Engage and Enroll in CTE						
Parents are supportive of their children enrolling in CTE courses or programs	14.784	7	2.443	0.020	0.098	0.022
High school counselors are well informed and knowledgeable about CTE programs and entry requirements	12.577	7	1.586	0.142	0.201	0.268
School counselors and other adults advising students in grades 7-12 are familiar with their regional CTE center and the programs offered there	5.533	7	0.761	0.621	0.002	0.532
Middle school counselors use CTE centers as resources in career education for students	0.788	6	0.190	0.979	0.031	0.954
CTE Societal Role						
CTE programs are an avenue to the middle class for students living in or raised in poverty	11.561	7	1.886	0.073	0.002	0.338
The purpose of career technical education centers is to provide opportunities to students who are not successful in high school	18.648	7	2.468	0.018	0.273	0.024
CTE programs are an avenue to retain at risk students	8.722	6	1.472	0.188	0.011	0.319

Recent high school graduates and College students both had a more positive perception about how well prepared CTE students are for postsecondary education and to obtain a college degree, compared to Community members, representatives from Non-profit organizations, from the Government or workforce entity, and Representatives from postsecondary organizations. This, too, is interesting, considering that both groups of Recent high school students and those already attending college would have direct knowledge through their own experience. Regarding the support parents provide to their children's enrollment in CTE, Community members, representatives of Non-profit organizations, Recent high school graduates, and College students all have more positive perception scores than representatives of Postsecondary organizations.

One of the most important items about perceptions of CTE is "The purpose of CTE, and whether CTE provides opportunities for students who are not successful in high school." College students, Community members, and Business representatives had a higher score in the perception of what represents a critical CTE role compared to those in Postsecondary institutions, Elected officials, Non-profit organization representatives, and members of Government. Those in the latter groups have less favorable perceptions about a role that has long been associated with CTE.

Socioeconomic Status and Perceptions of CTE

A critical question that was asked in this study was: Does the respondents' socioeconomic status influence those perceptions? A Univariate Analysis of Variance (ANCOVA) was used to explore this issue, with the variable Income as the predictor and the respondent's Role (or stakeholder type) as the covariate.

Because of income disparities, respondents may perceive CTE differently. In addition, perceptions of CTE may be influenced by the kind of CTE infrastructure available: secondary CTE in this state is offered through regional centers only, which may result in urban areas having more, and more structured CTE programs than rural areas. Therefore, the question is: are the perceptions of CTE different for those living in an affluent area that is served by bigger and more resourceful CTE regional centers, as opposed to those who live in lower-income counties and may have less prominent CTE regional technical centers?

Table 9. *Univariate Analysis of Variance. Effect of Income on Perception with Role as Covariate, All Stakeholders*

	F	Sig.	Levene's Sig.	White Test Sig.
Relevance of Academic Content				
CTE programs integrate challenging mathematics content	0.490	0.613	0.165	0.144
CTE programs integrate challenging science content	0.147	0.863	0.828	0.146
CTE programs integrate challenging English content.	0.393	0.675	0.379	0.388
CTE centers provide rigorous and challenging learning options for all students	1.113	0.329	0.067	0.305
Students in CTE programs are as academically well prepared as their peers in non-CTE programs	0.115	0.891	0.835	0.103
Impact on Postsecondary Academic Options				
Exposure to CTE in HS influences a student's decision about post-secondary educational choices	1.001	0.368	0.453	0.071
Students in CTE are prepared for postsecondary education and to obtain a college degree	0.061	0.941	0.543	0.554
Work Preparation Relevance				
Middle & high schools, and technical centers have clear, structured, and easily understood paths to sustainable employment & continue education opportunities	3.684	0.026	0.010	0.005
Standards for CTE programs are up to date and reflect the requirements of a 21st century workplace	0.284	0.753	0.759	0.505
In technical centers, students have access to modern, industry specific equipment to learn needed tech skills	6.061	0.002	0.877	0.060
Industry and employers are actively involved in the CTE programs	7.565	0.001	0.017	0.396
Value of Work-Related Learning				
CTE centers have developed strong work-based learning programs for CTE students	5.277	0.005	0.100	0.015
Students in career pathways and CTE programs are well prepared to obtain an industry-recognized credential	4.695	0.009	0.149	0.717
Support and Advice to Engage and Enroll in CTE				
Parents are supportive of their children enrolling in CTE courses or programs	0.680	0.507	0.006	0.082
High school counselors are well informed and knowledgeable about CTE programs and entry requirements	0.108	0.897	0.919	0.004
School counselors and other adults advising students in grades 7-12 are familiar with their regional CTE center and the programs offered there	2.524	0.081	0.508	0.003
Middle school counselors use CTE centers as resources in career education for students	3.527	0.030	0.505	0.001
CTE Societal Role				
CTE programs are an avenue to the middle class for students living in or raised in poverty	2.682	0.069	0.004	0.083
The purpose of career technical education centers is to provide opportunities to students who are not successful in high school	0.687	0.503	0.567	0.336
CTE programs are an avenue to retain at risk students	0.730	0.482	0.361	0.193

For the ANCOVA analysis, the county median household income was used as the variable of interest (Deloitte & Datawheel, n.d.), which was clustered in three levels: high (five or more standard deviations above the median), medium (four standard deviations above and below the median), and low (five or more standard deviations below the median).

The objective was to determine if the mean scores of the perceptions in all items were the same across the three Income levels after controlling for the Role (or stakeholder type) they have regarding CTE or if "the differences on the dependent variable among groups vary as a function of the covariate" (Rovai et al., 2014, p. 204).

Results showed only five items in three of the six categories, where the covariate Role significantly predicts the perception score in each of those items (Table 9). In the items a) In technical centers, students have access to modern, industry-specific equipment to learn needed tech skills, b) Industry and employers are actively involved in the CTE programs, c) CTE centers have developed solid work-based learning programs for CTE students, d) Students in career pathways and CTE programs are well prepared to obtain an industry-recognized credential, and e) Middle school counselors use CTE centers as resources in career education for students, respondents categorized in the medium-level income group showed a statistically significant more positive perception score than those in the other Income groups after controlling for the covariate. If the assumption was that high-income stakeholders have negative perceptions of CTE, these results do not support such an assumption. Furthermore, a crucial question emerges: Why were no significant results associated with the low-income group? A possible explanation is that results could reflect that CTE may not respond to all needs equally across their student populations in all geographical areas. In that sense, there may be a disparity in how CTE serves students' needs.

DISCUSSION AND CONCLUSIONS

This study was conducted to analyze perceptions of CTE from the perspective of different stakeholders. The first conclusion is that perceptions seem to lean more positively toward CTE. Since there is no benchmark study, those perceptions appear to differ from the long-held and widespread perceptions of at least one generation ago. Future research should include more ways to examine these perceptions, particularly related to items included in "Relevance of academic content" and "Impact on postsecondary academic options," on the one hand, and "Work preparation relevance" and "Value of work-related learning," on the other. They are relevant as they directly relate to the two critical areas of the new CTE model: academic preparation for postsecondary education and skill preparation for work.

A second conclusion is that stakeholders have, in fact, different perceptions about CTE and that they showed some patterns. In the case of Current high school students and Parents, the latter group leaned more positively toward the academic content and postsecondary option. The same could be said of Recent high school graduates and College students, who have higher scores in their perceptions in the items of academic content and postsecondary options, among others. This is important from the perspective of both the historical evolution of CTE as well as the

constructivist theories of perceptions: parents and students are the ones that more closely have a direct, lifelong impacting contact with the CTE system and are capable of seeing and reaping the benefits that CTE may bring for students and families. Thus, it is not surprising to see them positively perceiving CTE.

A reverse conclusion holds for Elected officials, Representatives of postsecondary education institutions, and even School/System administrators: in several items, they had less favorable means scores than their counterparts. That is an important contribution of this study: it provides a picture of how those stakeholders still perceive CTE, what they need to know about the system, and what they can do to influence positive changes. If opposing views of CTE among those stakeholders still exist as they happened under the old model, it begs the question of why that is and whether interventions (e.g., professional development, awareness seminars) are warranted for them.

These results also suggest that, at some level, an association exists between socioeconomic status, the role of respondents related to CTE, and perceptions of CTE. Even though results from the ANCOVA analysis are somehow different from the long-held view that those with lower income will tend to have a better idea of CTE, they align more closely with the point made by Aliaga et al. (2014) that CTE participation has expanded to all levels in the socioeconomic status spectrum. This should be subject to further analysis vis-à-vis how CTE course taking is now structured in the education system and the options it offers to children from all socioeconomic status in terms of education and work preparation.

CTE is a complex educational system, and as such, it must overcome negative societal views and perceptions. Parents, school administrators, and other stakeholders need to keep the pressure on disseminating information about the positive impact of CTE and its value to students, families, and communities. The constructivist theory of perceptions claims that past experience and lack of information are critical for developing perceptions. At least for some stakeholders, that appears to be the case in this study. Equally important, there seems to be a need to be consistent with interventions targeting some of those stakeholders directly and critically involved with students: school counselors and school administrators, which are seen as playing the role of gatekeepers in favor of traditional, college-bound education.

Limitations

This study's results are limited to respondents and cannot be generalized to the non-participating population since they were not selected randomly. Future studies should be conducted using probability sampling techniques. Second, there was also a limitation based on data missing for some items, which ultimately limited the results in some of the analyses. Third, limitations also come from the lack of demographic information, and more nuanced covariates are needed to help explain the relationship between income and perceptions of CTE.

Regardless, this study is a benchmark for further understanding perceptions of CTE. Being one of the few national studies that look at perceptions of CTE from a broader perspective, it certainly helps to have better knowledge to adopt informed decisions regarding policy and communication with stakeholders.

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HIGH SCHOOL EDUCATION AS A BARRIER TO SUCCESS IN THE CONSTRUCTION INDUSTRY? FROM THE WORKERS' PERSPECTIVE.

Douglas J Swanson

ABSTRACT

This pilot study follows up on Construction Workers' Views on Hight School Education as a Barrier to Success in Their Field, IVETA Volume 26, Number 3 (2021). This research asks construction workers, all self-identified themselves as being either apprenticeship coordinators, trainers, or mentors of new workers in their industries, in the greater St. Louis, MO (USA) area. The conversations asked three questions; "Did High School Prepare you for Success in the Field of Construction" "What High Schools Are Doing Well" and "What do High Schools Need to Start Doing or Do Differently?" conversations followed. It was in these conversations that several themes emerged.

Key Words: *Construction Workers, High School Education, Workers' Views on Education, Post-Secondary Education Success*

INTRODUCTION

In the 1600's, military tactics evolved to where soldiers would occupy any space in the battlefield that remained out of the line of view of their enemies, as opposed to standing in columns and formations in full view of the enemy. This became known as 'hiding in plain sight' (Nevers, 2019). When this author started looking into barriers to workers' post-secondary education success, they were deep into the research and unsatisfied with what they were finding. Everything was from either the employer's perspective (what educators are not doing) or from educators' perspective (what employers need). Reviewing the list of sources, it was right there, hiding in plain sight, that nothing was from the former student, now worker, perspective. When you want to know how the meal was the chef has an opinion, they created it. The restauranter approved the menu, set the prices, and sold the meal so they would have an opinion as well. Yet, if we did not ask the person who ate the meal for their opinion, we are self -selecting not to find out from the most invested person in the exchange, the consumer. If we are not asking the consumer of education, the students (now workers) how their education prepared them for success in the industry that they went into, we are not able to fully evaluate the effectiveness of the secondary education systems.

The scope of jobs varies from industry to industry, as well as from region to region and state to state. The Bureau of Labor Statistics (BLS) tracks over 800 occupations (BLS, 2021) which addresses most common occupations but that surely is not all occupations. To begin to understand how workers viewed the value of their high school (secondary) educations, the construction industry was chosen to sample for three reasons: first, whether they ever working in one of the construction skill trades or not, every reader could somewhat identify in broad terms with what construction workers do; second, unlike many carriers the construction industry there post-secondary training available, through the Construction Industry Labor & Employers run apprenticeship programs for workers, that are entry-level positions in the industry. These programs do not require workers to delay employment or go into debt, as they build their skills and knowledge base; and the third reason was that the union halls provided access to a readily available group of workers that some other industries would not have provided.

REVIEW OF LITERATURE

The media has been all over trying to explain where the workers went. Before the so-called great resignation, baby boomers, born between 1946-1964, were retiring in mass. At its peak in 1999, boomers constituted a workforce of 78.8 million people. They remained the largest demographic in the U.S. workforce until 2019 (Hertz, 2022). According to PEW Research the first year of the pandemic, 2020, did see a 3.2% jump in the number of boomers retiring, over the average of 2.05% in the previous 8 years (Fry, 2020). By the end of 2029, the last of the boomers will be eligible for retirement. That dynamic alone is having a profound shift in the workforce. As a result, the BLS projects that the average age of the U.S. workforce will is trending back up from 39.6 in 2001 to 41.9 in 2011 and 41.7 in 2021 (Covid effected) to a projected 42.6 in 2031 (BLA, 2022).

The initial review of material started with evaluating secondary education with relation to effectiveness in the workforce from the early 2000s as the boomer was beginning to dominate the workforce. An article of that period included, *Do different dimensions of male high school students skills predict labor market success a decade later? Evidence from the NLSY, Research on Workplace Skills Employers Want* (Murname, R. et al*,* 2001) which studied 27- and 28-year old's academic skills, elementary mental tasks, and self-esteem, but did not appear to talk with them as people. In 2002, William J. Wilhelm published a chapter *Research on Workplace Skills Employers* in *Want Meeting the Demand: Teaching "Soft" Skills* (2002), while acknowledging the apprenticeships have been around for thousands of years, its primary focus was examining the University's acceptance of experience-based learning. Again, workers were not talked with. Even more current work like *College and Career Ready in the 21st Century, Making High School Matter* by James R. Stone, et al, (2012) focuses on the fact that only a minority of 9th-grade students complete a 2–4-year college degree, not on how students are prepared for work.

Further literature review discovered more of the same. This resulted in the decision to conduct research that asked workers what they thought of their high school education and how it prepared them for success in their chosen field of employment.

RESEARCH METHODOLOGY

The Workers' Perspective on Their Postsecondary Success Opportunities

This research focused on how well construction workers in the United States, who have been out of high school for approximately 20 years, felt they were prepared for being successful in the workforce; how the skills for success in the workforce have changed; and what skills workers just entering the workforce will need for them to be successful. The first phase of the study was qualitative research that collected data nationally via an online survey and was the subject of the article *Construction Workers' Views on High School Education as a Barrier to Success in Their Field* in Volume 26 Number 3 (2021) of this journal.

The second phase, the subject of this article was also a qualitative study conducted as a follow-up to the survey phase to further explore those results. The exploratory follow-up went into more depth with some of the data collected from the online survey using in-person interviews utilizing Zoom meetings technology and in-person interview. The principal area of the research was the Greater St. Louis, MO (USA) area.

The goal of this part of the study was to attempt to interview workers who have been out of high school for about 20 years, a single generation. Additional data was collected from participants, including social benchmarks such as gender and race. Lastly, this research asked workers participating about the work skills future workers will need for them to be successful in the workforce of the future.

Research Questions

This study attempts to answer the following questions:

1. Are high school students being provided the education and skills needed to be successful in the workforce?
2. How are those skills changing, and what skills are new workers going to need to be successful?

To answer these questions, workers who are currently in the workforce who have experienced many of its changes or are in the position to have witnessed the challenges facing the work and workers of the future, were interviewed. The interviews contained both open and closed questions.

The researcher formulated interview questions based in part on the results of Phase I of the survey results. Interviews occurred to further tease out specifics that an online survey cannot produce. The one-on-one or in-person interviews (Phase II) were conducted locally in St. Louis, MO (USA) to explore specific impacts on that area.

Research Design

The framework of intersectionality and interest convergence was used for the research to explore workers' views on how their secondary education prepared them for success, or not. This research used an exploratory qualitative multiphase research design method, which is a process for collecting and analyzing quantitative data from multiple phases of a study at a point during the research process into a single outcome (Creswell & Creswell, 2018).

Sampling

The qualitative target population of this study was workers already in the workforce. More specifically, the ideal target of the research was workers who have been in the workforce or could have been in the workforce for 20 years (+/-). The reasons for focusing on workers with this level of experience in the workforce, 20 years (+/-), was that they have both the experience in the workforce to reflect upon in answering the questions posed to them, as well as having been in the workforce for a sufficient time to have seen changes to the skills workers need to be successful. Their experience with workforce expectations and their opportunity to witness the changing skills demanded of the workplace, allowed these subjects to answer the questions regarding the changing nature of work and worker skills needed to be successful in the workforce.

Some of the candidates for these interviews may have also been respondents from the Phase I survey. Participation in Survey Phase was not controlled for in the Interview Phase since participation in one was not reliant on the other.

The interview portion of the study focused purposefully on sampling workers in St. Louis’s construction field. This phase intentionally asked individuals open-ended research questions that allowed them to share their insights born from their experiences. These discussions better enabled the researcher to pursue questions in search of answers that were better addressed in a

conversational setting than what an online survey would have produced. Participation in this phase of the study was random.

The study provides responses to how the interviewees were prepared for entry into the workforce. Additionally, participants were asked questions that allowed them to speculate on skills that the next generation of workers will need to be successful. While this line of questioning was speculative in nature, the foundation for that speculation is in the changes that respondents or interviewees have experienced and witnessed during their careers.

Data Collection

After analyzing the survey data, areas, where additional detail or clarification was needed, were determined for addressing via one-on-one interviews. The researcher is a Labor and Workforce Development Specialist with the University of Missouri Extension, as well as the Labor Studies Certificate Coordinating faculty member for the University of Missouri Saint Louis (UMSL) College of Arts and Sciences, which is a course-share certificate program with the University of Missouri Kansas City (UMKC). The principal investigator employers, the University of Missouri Extension, and UMSL supported the study. Some of the principal investigator coworkers were involved in the pilot testing of questions and topics. Specifically, Field Specialist's in Labor and Workforce Development with the University of Missouri Extension Dr. Amy Patillo and Matthew Pezold M.S. These collaborations and reviews contributed greatly to enhancing the overall quality of the online survey.

The principal investigator was able to use his role with the University of Missouri Extension, Labor, and Workforce Development Program to create tools that generated contacts and develop interview opportunities for data collection.

The primary focus of the research was on how well construction workers in the St. Louis area have been prepared for success in the workforce. The education outcomes that were focused on were primarily from the respondents' high school experiences. Factors like geography (location), race, and family economic status influence and contribute to the effect of how a student is prepared for success in high school were not factored in. Furthermore, this study did not attempt to differentiate between individual schools, or between public, private, or charter schools.

Subjects interviewed in this phase of the study demonstrated that they are often the people who are providing the training to new workers. This demographic of workers has both 'been there long enough to know what needs to be done, and they will also 'be there long enough to want to ensure that the new hires have what it takes to be successful.

RESULTS AND DISCUSSION

Interviews' Outcomes

A total of twelve individuals were interviewed for this research. Each was contacted by the researcher through the course of his work as a State Specialist in Labor and Workforce Development or his work as the Labor Studies Certificate. After assessing that they met the basic criteria for the study, being in the construction field, or have been in the construction field, the participants asked if they would be interested in being interviewed for the study. The randomness of these contacts provided a convenient sampling that could not be scripted or predicted.

The individuals surveyed were all male, see Table 4. One was Latinx, four were African Americans, and seven were Caucasian, as noted in Table 1 below.

Table 1. *Subjects by race.*

Gender	Number of Interviewees	%
Black	4	33.3
Latinx	1	8.3
White	7	58.3

They all graduated from High School, between 1977 and 2012 and have worked in the construction field for between 3 ½ years and 40 years. The specifics of what year they graduated and how long they have worked in the construction field is found in Table 2 and 3.

Table 2. *Subjects by year graduated from high school.*

Year of Graduation	
1977, 1985, 1989, 1992, 1994(3), 1996, 1998, 2000, 2002 and 2012	The Average Being in 1994, or 26 Years Ago

Table 3. *Subjects by years of experience in the construction field.*

Number of Years in the Construction Field	
3½, 7, 10, 17, 18, 21, 26, 28, 29, 35, and 40 (one did not answer this question)	An Average of 21.3 Years of Construction Work Experience

Table 4. *Subjects by gender.*

Race	Number of Interviewees	%
Male	12	100
Female	0	0

On the surface, the gender mix, more specifically the lack of gender diversity, created by this random sample was less than ideal. Reports vary, according to The National Association of Women in Construction (NAWIC), in 2018 women made up one and one-half percent of the construction industry (NAWIC, 2020). A U.S. Bureau of Labor Statistics report, last updated January 20, 2022, reports the female participation rate in the broader category of Construction and Extraction Occupations at 3.3%, with percentages within individual crafts varying (BLS, 2022). Simply put, this sample of twelve interviews, may have been too small to generate a more diverse gender mix. Other than the lack of gender diversity, the random sample provided responses that had only a slight, 1.3 years, a higher number of years of construction experience than the ideal target of 20 years of experience. Future studies should prioritize sampling that has a gender mix that reflects that of the construction industry.

There was a slightly older, by six years, average higher age than the targeted subjects' ages. This was still well within the generational parameters. The target goal for the interviews was workers who had been both out of high school and in the construction field for approximately 20 years with a representative social mix.

There was not a targeted goal of responses by race. The responses of 58% White, 33% black, and 8% Latinx were lower than expected for Latinx. Due to how the convenience sampling was constructed and the small size of the sample, 12, this outcome was otherwise acceptable.

Taken as a whole, this convenience sample was very satisfactory for the purposes of this study. Several themes emerged from these discussions.

Question: "Did High School Prepare you for Success in the Field of Construction"

Only one of the persons interviewed answered this question in the affirmative. In this case, the person took shop classes learning basic tool skills and enough about electronics that along with their history and math classes, he was successful in the military. That military experience became the foundation for his success in the construction field. One other respondent did feel that his math and science education helped him, but he did not have enough access to industrial arts, or shop classes, to really enter the field well-prepared. Another one did mention that the drafting class that he had taken in high school assisted him by being able to read construction plans easier when first entering the field. One interviewee summarized their high school experience this way, "I got a good high school education. I learned a lot. I mean, I feel like I grew up well-rounded, but they just never prepared me to go to work." Another one summed up their high school experience this way, "Well, to be honest with you, I think, high school didn't prepare me at all for what I was going to be doing, but at the same time, I really didn't know what I was going to get into."

There was a sense that the interviewees felt that high schools could do more to promote careers, like those in construction, that do not require a college education. The majority felt that too much pressure had been put on them to go to college and figure out a career afterward instead of going into careers working with their hands directly out of high school.

Question: "What High Schools Are Doing Well"

After the discussions that resulted from asking the interviewees 'Did high school Prepare you for Success in the Field of Construction' the interviews did segue into a discussion of the positive outcomes from the current high schools, i.e., What are high schools getting right with workers leaving high school these days? The ensuing discussion of the positive skills the current entrances to the construction workforce possess, along with the earlier question of How well high school had prepared them personally, helped to bracket the remaining discussions. While the first question, remembering their high school experience, established a benchmark for comparison. The second question, current new workers' skills, gave the interviewees the opportunity to conclude if high schools are better preparing, or not, for today's students. This set up the discussions of what high schools should be doing differently.

While a great deal of the information learned from the interviews may appear negative or critical of high schools, it is important to note that the tone of the conversations was not overwhelmingly condemning the education system. Several positive attributes that new high school graduates possess were discussed. Highlights of those comments include "New workers are quick to pick up on the newer tech skills/screen skills." Other comments can be found in Appendix A.

New workers are better positioned to work the newer more technologically advanced equipment on construction projects, which puts them at a distinct advantage over the older workers when it comes to working with the newest equipment. However, it was also felt that they could enhance those tech skills by learning how to do the task without the tech so that when the equipment stops working, they do not.

Question: "What do High Schools Need to Start Doing or Do Differently?"

The third part of the interview was to talk about the future. For example, will those workers entering the construction industry in 10 years be better or worse prepared for success in this field? This part of the ensuing discussions did require the interviewees to speculate, drawing on their high school experience and their experiences more importantly in training and mentoring current new entrances into their chosen fields. These conversations could not take place without looking at what high schools are doing, could be doing, or perhaps doing differently. The general tone of the conversations was not critical of the education system but more, If I could change things I would change, it would be. The comments were specific from those conversations. An example of this is "They are not prepping you to work, they were prepping us for college, which I did not go to because I had to have a job to get by. I didn't know how to fill out insurance papers, w2, w4, and had no knowledge of anything workforce related," "There is a need to teach skills for working with older workers. It is not like being in school or dealing with your friends. Those older workers may come off as being gruff but mean well, and there is

a lot that can be learned from them if you talk with them," and "There has been a shaming of working in the building trades. That needs to be reversed." A more detailed list of comments can be found in Appendix B.

Taken as a whole, this convenience sample was very satisfactory for the purposes of this study. Several themes emerged from these discussions.

A solid foundation in math is still very important. It is more important for students to be able to function without the need for calculators, computers, and Smartphones to do basic things. Incorporating problem-solving skills into course curricula would also help students develop confidence in their problem-solving skills. Learning the skills needed to work in multi-generational workforces, as opposed to just being in class with people their age, would also strongly benefit a student's ability to acclimate to the workforce.

These generalized discussions of their experience with their high school, the job skills possessed by the current entrances to the workforce, and their thoughts on the future of work skills were further broken down into more detail. This area of discussion was pivotal to the goals of this research, meriting drilling down into the discussions more. In doing so, additional themes emerged from further scrutiny.

Observation from the interviews

"There is a Stigma of Working with Your Hands, vs. Everyone Needs to Go to College"

One hundred percent of the interviewees spoke to the fact that there is a negative perception of those who work with their hands. Their common belief is that both societies, as well as educators, do not value career tracks that result in students working with their hands, 'getting dirty, as opposed to careers that require college first. Most of them recall that just a generation ago where students could enter the workforce with a high school education and be successful.

This research did not focus on distinguishing between union and non-union workers. Yet, many of the interviewees commented about their having come through apprentice training programs. Training programs like those mentioned are often run as a collaboration between labor unions and signatory employers who hire workers in those fields at little or no cost to the trainees. In addition, workers come out of those programs with jobs, whereas graduates from university leave in search of jobs. Trainees (apprentices) in apprenticeship programs work while they learn or as they say, earn while they learn. The inequity of paying for an education, without the promise of a job vs. being paid to learn a skill was not lost in these discussions. Yet, it was felt that the social stigma appears to still linger over skill trades.

Specific comments from the interviewees summarizing this point are in Appendix C. A couple of examples of those comments are "When I attended high school shop classes were thought to be for dumb kids when, they teach you fundamental life skills and common-sense ways to problem solve. There is way too much focus on how well someone can take a test or not," and "They only considered those that were going to college would be successful. My career gave me the opportunity to become an instructor, apprenticeship coordinator, and now I am the

Executive Director of the Roofers & Waterproofers Research and Education Trust Fund for our International Union in Washington, DC."

Whether by intent or by accident, it is felt that high schools are steering all students to college as a default. If you are not interested or capable of going to college, you are looked down upon while in high school, adding to or creating the stigma that has cast a negative perspective on those who work with their hands. As one of the interviewees said, "Society glorifies scientists and engineers who do the designing of projects but not the men and women who build them, maintain them, and make them work."

High schools could be the change agents in reversing this trend by focusing on the positives that come from being skilled workers.

"Thoughts on the Need for Industrial Arts Programs (Shop Class)"

Three-quarters of the respondents talked specifically about the need for industrial arts programs, shop classes, in high schools, and, or, how to improve those programs where they still exist. As one of the interviewees commented, "High school is not typically trade-oriented." Real or perceived the perception is that industrial arts programs have been cut or eliminated due to budget reasons over time. Additionally, the perception is that not all schools have equal access to these more costly programs. As one interviewee said, "If you're in the 'hood' they don't teach skill trades like construction. If I am from the country, they teach these things there." Another commented that "I had no idea what skilled trades were until I met a friend when I was 27. If I knew about skilled trades such as Millwright, I would have never tried college because I knew it wasn't for me, but I was pushed to try and I did. I dropped out and started working."

It was felt that too few school systems offer industrial arts classes. Even when there are industrial arts classes offered, it was felt that space in them is limited. In some cases, it was felt that where there are programs, they do not go into either enough detail and/or do not go into enough, if any, real-life experience, or skills development.

There was an overwhelming sense that high schools without industrial arts programs are not able to introduce students to the kinds of careers that often would lead them to the construction industry. Without being exposed to these kinds of skills in high school, it was felt that except for having personal knowledge of someone in the construction field, students would not know about the options these kinds of careers provide, including that many times these careers have apprenticeship programs that allow workers to earn-as-they-learn.

Because students do not get exposed to these kinds of skills and careers in high school, most of the workers interviewed felt that students are left feeling that their only option is to go to college, incurring debt in doing so, with the understanding that it will improve their chances of finding meaningful and better-paying employment, but not a direct pathway to a job. One of the interviewees noted that "I believe that shop classes are needed in high schools to promote building trades. We must understand that not all kids will go to college or can afford to go. Apprentice programs allow them to work in the field of their choice and earn a good wage with good benefits, while attending a 3 to 5-year program and graduate with no debt."

“Students Need to Learn How to Work Their Way Out of Problems”

Universally, the workers interviewed talked about how students going into the construction field need to be better prepared to work their way out of problems. Most elaborate that these skills are valuable skills for any profession, not just those related to the construction industry. It was felt that too much time was spent on computer-based theoretical skills and not enough time on hands-on and real-life examples. Not that computer skills are not important, but that focusing primarily on how things should work using a computer model does not prepare future workers for what to do when faced with the need to adjust to fit field conditions. Few workers spend their entire lives building only new projects. Most spend much of their careers putting on additions, repairing, and remodeling projects that require a considerable amount of time and skill to adapt plans to meet field conditions.

It was felt that high schools are spending a disproportionate amount of time on computer skills and modeling at the expense of hands-on or real-life, problems solving, experiences for students. This assumption that high school education is providing a foundation for college educators to expand upon creates a hole in the skills students take into the workforce who have not gone on, or will not go, to college. That hole that the workers interviewed talked about came to be defined as the skills needed to adapt and work their way out of problems encountered or of their own making.

A subset of this discussion was the observations made that new workers coming into the construction workforce often seem to lack the sense that learning is an ongoing lifelong endeavor. It was felt that high schools could do more to provide life skills for students that include the understanding that having the education and skills get you in the door but that does not mean it is the end of your journey or learning. Key comments include: “If you can't problem -solve, it is going to be tough on you to be successful in this field,” “we need more bright people; we need people to the problem to solve on the fly,” and “current entrants to the trade are not as well prepared. Newer workers will go to the computer (or smartphone) and google a question, then assume it’s correct, instead of talking to a person with experience.”

Another topic that emerged from the conversations was that job skills training is missing from the current entrants to the workforce, basic skills all workers would benefit from regardless of the industry they go into. These were often spirited conversations with frank, blunt talk about the experiences the interviewees are having with the current crop of entrants to the workforce. Much of these conversations were forward focused on what future workers need to be better prepared for success. These conversations were not mean-spirited in any way but genuinely intended to be helpful. A couple of related quotes from the interview include “These days I hear it more and more from the foreman out in the field and from the contractors that they need somebody that is reliable, that gets up every day, no matter what the issue is, and goes to work,” and “Getting your butt out of bed in the morning, that should not be difficult for a lot of the kids and that’s just the basics for everything. Instead of so much focus on being good test takers and what college is going to get into, can you just give them the life skills that they need to get out on their own and do well to succeed?”

Regardless of the career path taken, the interviewees felt that all students would benefit from a more comprehensive life skills training program. It is important to create problem solvers, self-starters, and people willing to make mistakes but try again. While in the construction industry mistakes can be costly, even deadly, the fear of failure can damage production. It was felt that high schools could do a better job of building these skills and the confidence in students by incorporating problem-solving skills and personal development problems rooted in real life and building problems in the science and math classes. A balance is needed. That balance is best achieved through education and experience.

All the workers interviewed talked at some length about the need for work skills training for current high school students. These are skills that the current new workers are mostly missing. Too often current new workers were felt to be lacking both the confidence to talk with more senior workers about how to do their jobs safely and effectively, as well as the respect for paying their dues and working their way up the ladder.

Several talked specifically about new workers spending too much time on their cell phones while working. Most of the jobs the workers interviewed are experienced at are dangerous and being distracted by a cell phone puts not only that worker at risk, but others as well. The excuse of listening to music or looking up how to do the task at hand on YouTube comes across as disrespectful to the need for safety. This not only puts the new worker in an unfavorable light due to using their phone, but it also demonstrates an unwillingness to follow proper or traditional normal job site protocols.

It was felt that new workers are too complacent regarding showing up to work on time and even being available to work overtime when needed. Some of this was believed to be learned behavior from having been allowed to arrive at school or class late, with little or no consequence.

The conversations did try to focus on what basic work skills high schools could teach even if they lacked industrial arts programs. They lacked basic life skills like packing their lunch the night before and fueling their vehicle on the way home from work, instead of on the way to work. Still, these are no substitutions for having the motivation for getting out of bed in the morning, every morning, and showing up.

Criticisms aside, it was felt by some of those interviewed that most of these new workers do not know what they are capable of. Either they have not been challenged in their life, or they have always received participation trophies for just showing up.

“Schools Need to Teach the History of Work and Working”

A subset of the discussion on the need for working skills was a discussion of the need for a better understanding of the history of work and working in the United States. These conversations were rooted in students, now workers, not understanding the basics of work and working culture and why the rules are what they are. An understanding of why work laws, rules, practices, and customs are what they are would better prepare new entrances into the workforce with a clearer understanding of both expectations of what is expected of them, as well as what they can expect in return.

Most of the interviewees found that few new workers possess a basic understanding of the history of work and working in the U.S., let alone what workplace culture, policies, and practices are. This lack of basic understanding puts any worker at a disadvantage in being successful before they even begin their careers. Supplementing history, social studies, or other curriculums with workplace and/or labor history would help students better enter the workplace prepared to succeed. One interviewee commented, "We do not have any paid holidays. When you are off, you collect unemployment. That is what it's there for. Save your money. We get paid a good wage. We get paid well, and I tell the young people all the time. Put money away for a rainy day. That is why we get paid the good wage that we do, it is not so you can go get a lake house and all that other stuff. It is to save your money for a rainy day, "as an example of the lessons learned on the job

"Workers Need to be More Self-Reliant"

Nearly all the workers interviewed were either formally responsible for overseeing the training, providing training, or informally mentoring new workers entering their construction craft. While construction workers generally work on crews, large and small, the work that they perform is often independent and on their own. While the discussion was wide-ranging, two themes did occur; students entering the field need to be more self-reliant and able to solve their own problems, as well as take responsibility for their work and their actions. The perspectives of the interviewees on current workers entering their craft may be indicative of new entrants to the workforce in other industries as well. Comments regarding this theme include "Do not do everything for them (students). Let them work their way out of a problem," and "Future students who want to go into the trades would be better served with programs and classes that teach individuals technical problem-solving skills, like how to work solutions by deconstructing the problem and creating options that will allow them to achieve their desired outcome."

High schools need to do more to help students become more self-reliant before they embark upon their professional careers, regardless of that career. This was one of the most consistent themes of the interviews. Workers need to be responsible. Show up on time and show up every day. This is not just unique to the construction industry. The same can be said for every industry. What is somewhat unique to the construction industry is that workers need to come prepared to work with what they can carry with them. On some projects, they may be able to return to their vehicles to retrieve something that they need, but that is not always the case. In general, you show up and work with what tools and skills you bring to the game. There is no phoning a friend. There are no do-overs. You need to be ready.

CONCLUSION AND RECOMMENDATIONS

There is a growing shortage of workers in the U.S. Past efforts to determine how to best prepare future workers and students for entry into the workforce have willfully ignored canvassing the current workforce to determine what skills and education programs they feel helped to prepare them for success.

This study demonstrated increased communication between secondary educational institutions and workers who are in roles of training or mentoring new entrances to the workforce Vocational Education and Training programs are perfectly situated to facilitate those kinds of discussions.

In addition to pointing out what secondary educational institutions as doing well and what could be done differently, these interventions exposed several themes that the secondary education systems need to take a much closer look at and how they can address them. The themes that "There is a stigma of working with your hands vs. everyone needs to go to college, 'There is a need for more industrial arts programs,' 'Students need to learn how to work their way out of problems, 'Schools need to teach the history of work and working' and, 'Workers need to be more self-reliant, are all things that can be addressed by including life lessons and skills in current courses. The industry examined in this study there can greatly benefit from increased communications and collaborations between the secondary educational institutions, the vocational education and training programs, and the employers in the industry to de-stigmatize 'working with your hands' and to showcase the types of careers possible to students before they enter the workforce.

Success in refocusing the evaluation of the secondary education systems from just being done by educators and businesses to including a strong representation of student/workers' voices by Technical Vocational Education and Training programs can begin the process of integrating life experiences feedback and lessons for secondary education programs.

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Appendix A

Phase II interviews comment on the positive attributes that new high school graduates possess coming into the current construction workforce includes:

- One of the companies we work with a lot now does their punch list (a final inspection list of final touch up items that need to be addressed after a project has concluded and inspected) on a tablet or iPad. You used to receive a letter with a list of items to address. Now, they just email you the PDF of the whole list with photos attached. You go through and you mark off or check a box when it is done with supporting documentation and attach photos to return it. These kids who have grown up with a smartphone will know how to operate all these operating systems out there.
- These new workers can probably operate any computer program-based equipment that they run into with only a few minutes of messing with it.
- New workers are quick to pick up on the newer tech skills/screen skills.
- The newer workers are better position to do the newer tech jobs. They learn them quicker. They do not write an algebraic equation to figure out ‘a cut’ for conduit, they use an app instead Is it wrong? No, but they should learn how to write the formula as a backup. I do not care how they learned, only that they learn to do it right.

Appendix B

Interviewees comments in response to the question, “Will the workers entering the construction industry in 10 years be better or worse prepared for success in this field?” Or, if I could change things, I would change …

- To be successful you need a strong foundation in math, decimals, fractions, simple geometry. Consider integrating construction problems into math and science classes so students can conceptualize how to use the lessons being learned.
- You need to be able to do some of this math (fractions for example) etc. in your head and not relying on a calculator, computer, or smartphone. Learn the skill before learning to relay on the machines.
- There has been a shaming of working in the building trades. That needs to be reversed.
- There is a need to teach skills for working with older workers. It is not like being in school or dealing with your friends. Those older workers may come off as being gruff but mean well, and there is a lot that can be learned from them if you talk with them.
- They need to know how to frame the math problem in their heads so that they can figure it out on the fly.
- The shop class that I had did not go into any detail and did not prepare you for working in the field. More real-life experience is needed.
- General problem-solving skills are critical.
- My high school was very college prep oriented and did not want to focus on the trades (building trades) and teaching for the trades. Schools today should broaden their career offerings.
- High Schools are still very focused on college as the only way to become successful in life.
- High Schools focus a lot on computers skills but there's still good paying jobs that you do not need computers skills for.
- At one time person could graduate with an actual trade skill, like plumbing, laboring, or carpentry. Now, the assumption is that you must continue to keep going to school before going to work.
- They get no hands-on training in school, spend too much time on computers.
- Not everyone is going to want to go to, or needs to, go to college. Too much emphasis is put on college preparedness.
- Students today are way worse off than when he entered the workforce. No shop classes.
- Don’t’ even have home economics classes. Both parents work so they do not have time to teach their kids how to do the things we use to learn at home.

Appendix C

Comments from the interviewees that best summarize how they feel that a negative social stigma appears to linger over skill trades, and the workers in them.

- High schools need to teach an actual trade so than an educated choice can be made, as opposed to seeing college as the only option.
- Guidance counselors do not ever show you a curriculum that encourages people to go to work with their hands and do any kind of physical labor. It is almost like they are seen as shameful careers. If you went to a counselor to talk about shop classes, you would almost feel like the guidance counselor thought you were trying to escape by not actually learning a real skill.
- They never told you that there was an opportunity to graduate high school, join an apprenticeship program and start making money right away, instead of starting out accumulating debt.
- There were guys that think 'I'm not going to be a blue-collar worker, working with my hands, I'm going to college' without an idea of what they were going to do afterwards. I kind of think that if you know they had some opportunities to show people like hey look, you can make a decent living at doing this other stuff people would think differently about these jobs.
- My older sister, she is a successful woman, but she went through college. She is still paying on college debt, and she graduated two years before me. I have never paid one cent of college debt. I do not understand why our school systems think that's a successful way to move into your adulthood. I think apprenticeship programs can be applied almost unilaterally across the board with other skills as well.
- High schools need to stop pushing college as the end all of everyone. Support the apprentice programs.

WORK-LIFE BALANCE, WELLNESS, and WELL-BEING (US CONSTRUCTION APPRENTICES): A FOLLOW UP TO A PILOT STUDY

John S. Gaal

ABSTRACT

The research presented herein expands upon a 2019 pilot study that exposed the "wellness and well-being" issues of US and Canadian construction (carpenter) apprentices. This follow up study not only recognizes the need to cast a wider net to include more diversity (i.e., trades, gender, race/ethnicity, and regions) but also attempts to address how the advent of COVID-19 changed the way the world lives and works—among other hot topic issues percolating in the construction industry since March 2020. While the inferential statistical (T-test) results indicate that a significant difference exists between the US apprentice groups in the pilot (control) and follow up (experimental) studies, the FIG model allows for a closer examination of more narrowly grouped topics and suggests that much work is still required to meet the work-life balance needs of apprentices across the spectrum. For those topics not covered in the pilot study—in which there is no means for comparison—this author provides an Auxiliary section that allows an opportunity to examine the raw data from the study's participants while laying a foundation for further investigation into areas of potential concern. The need to integrate behavioral/mental health training(s) into the apprenticeship programs is established herein.

Key words: *apprentices, construction, work-life balance, wellness, well-being, COVID, concussions, suicide, trauma, anxiety, stress, behavioral/mental health, peer support*

INTRODUCTION

This research project is a result of performing a broader study based on this author's article that appeared, in this journal, in March 2021: *Work-Life Balance, Wellness, and Well-being: How Might CTE/TVET Play a Role?* Much has transpired since the summer of 2019 when the original survey was launched. A worldwide pandemic known as COVID-19 has changed the way people live and work across the globe. Features of this recent follow up study (FUS) launched go beyond the 27 questions in 2019 to include new issues that have gained notice in the construction industry over the past three years.

This FUS attempts to address a few key limitations of the 2019 pilot study (PSU: US apprentices only). One might say that in order to seek more generalizability of its findings, this author needed to "cast a wider net" beyond the 49 (apprentice) participants—from the same trade—in the pilot. As such, efforts were made to include more diversity from the trades, gender, race/ethnicity, and regions. This FUS surveyed over 100 participants of which only 96 were deemed eligible as set forth by the parameters of this work. (Six participants did not meet the "equal to or more than 12 months" in the trade standard.)

As noted in the 2019 article, since 2016, behavioral/mental health (BMH) issues were on the rise in the US's K-12 school system (Gaal, 2021). Sadly, COVID-19 further exacerbated BMH matters by causing most K-12 school systems across the world to either close or move to an online environment. To this end, some experts suggest that prolonged isolation, or in other words, removing children from vital social settings during their formative years may increase anxiety, depression, and some cases suicide. In fact, Jones et al. (2022) found that nearly one in three high school students experienced poor mental health during COVID-19. Since many aspects of construction in the USA were considered essential, these apprentice workers were faced with having to still go to the job and in most cases attend school for their related training sessions. Thus, exposing apprentices to their own set of stressful situations where social distancing was not always feasible. At the same time, requiring these workers to adhere to other safety-related measures, including but not limited to, wearing masks, getting vaccinations, etc. in order to remain on the job.

As discussed in the PSU, the OSHA-10 safety training model introduced nearly two decades ago to the construction industry should be studied and possibly emulated with regards to fully integrating BMH issues into US-DOL's Registered Apprenticeship Programs (RAP) across the USA. Accordingly, Gaal (2021) posited, "Secondary and post-secondary CTE/TVET programs should coordinate mental health training efforts with respective industry partners" (p. 110). Equally important, the secondary school system's CTE/TVET programs in the USA play an important role in recruiting the next generation of apprentices for the construction industry. As a result, they often seek ways to provide their students/graduates with coursework that allows them to enter RAPs with advanced standing. This was the case with OSHA-10 training years ago. Therefore, offering coursework that addresses BMH topics can serve as a new means of additional credit towards advanced standing.

LITERATURE REVIEW

In March of 2020, the Corona Virus Infectious Disease 2019 (COVID-19) pandemic began to sweep across the USA as well as other parts of the globe. Offices and schools—at all levels—were forced to address the spread of this deadly virus. As of November 2022, the Centers for Disease Control and Prevention (CDC) reports that more than 98 million people in the US have been infected and over 1 million have died. Many of these organizations selected to move their operations to an online environment. In so doing, mental health and substance misuse issues became cause for concern for related researchers. Soon enough, there were complaints that insurance providers were not providing the same level of service for matters of mental health as they were for physical health. In fact, in April 2021, the APA reported Smedley testifying the following before Congress, "The COVID-19 pandemic worsened what was already a mental health tsunami in this country." With respect to the construction industry, Brown et al. (2020, p. 5) asserted that, "Nearly one million construction workers lost their jobs from March to April 2020."

In a recently released report from the US Surgeon General 's Office, Murthy (2022, p. 7) claims, "76% of respondents reported at least one symptom of a mental health condition, an increase of 17 percentage points in just two years." Over the past 2.5 years, issues such as isolation, anxiety, depression, and suicide seemingly appeared weekly in the popular press. To this end, McKay (2021, para 1) posited, "Life expectancy in the US fell by 1.5 years in 2020, the biggest decline since World War II, as the COIVD-19 pandemic killed hundreds of thousands and exacerbated crises drug overdoses, homicides, and some chronic diseases." Further noted by McKay (para 4) was that, "Many people skipped or delayed treatment last year for conditions such as diabetes or high blood pressure and endured isolation, stress and interruptions in normal diet and exercise routines."

Shifting to a narrower focus on the construction industry, the Center for Construction Research & Training (CPWR: 2021) indicates that construction workers are 7 times more likely to die by an opioid overdose than the average worker. Meanwhile, Dong et al. (2022, para 3) proclaims that, "Male workers aged 18-25 years were five times as likely to report serious psychological distress and twice as likely to report suicidal ideation than those 50 years or older." Accordingly, the findings of Brown et al. (2022, pp. 3-4) deepen this concern,

> Among [construction] workers who were surveyed in both 2019 and 2020, 43% had increases in the frequency or level of anxious / depressed feelings between years, with increases more common in those who were age 18-54 (46%), female (50%), or had a family income below the poverty line (61%).

With an even narrower focus on apprentices, Boyle (2021, p. 8) cited five key reasons why apprentices face a reduced sense wellbeing and potential mental-ill health: bullying, long hours, low wages, job insecurity, unrealistic expectation." To this end, when it comes to construction apprentices, McCormack et al. (2013, p. 407) point out that this group of workers are particularly at risk "…due to their relative youth and their lack of hierarchical power and

status." Furthermore, Ross et al. (2022, p. 295) noted that the bullying of construction apprentices—often directed towards smaller or more novice workers— "…has been associated with increased job dissatisfaction, substance misuse, poorer mental health and well-being, and suicidal behaviors."

Two other major areas in the Auxiliary section of the FUS not yet touched upon are concussions and trauma. These two topics are of particular importance especially since the US-DOL's Title 29 (also known as 29CFR30) (2016) encourages registered apprenticeship programs to actively recruit targeted populations (i.e., Veterans and formally incarcerated citizens). To this end, Gaal and Beyer (2021, p. 23) contend, "The construction industry actively recruits and hires workers whose prior work background may have exposed them to concussions and other forms of traumatic brain injury (TBI), namely military veterans and former high school and collegiate athletes." Meanwhile, van der Kolk (2022) alleges that almost every inmate in the US prison system has some serious level of trauma. With the advent of COVID-19 came a host of other major BMH issues affecting construction apprentices. Therefore, it was necessary to expand the framework of the PSU.

Research Question: With respect to work-life balance, wellness, and well-being issues, is there a significant difference between the apprentices surveyed in this FUS and the US apprentices surveyed in the PSU (Summer 2019)?

METHODOLOGY

Design of study

All 27 of the questions used in the PSU were also included in this FUS. However, due to COVID-19, a new fourth (Auxiliary) section was added to address a number of related issues that have become more prominent in the construction industry since 2019 (See Appendix A). These include, but are not limited to, how COVID vaccinations, COVID deaths, traumatic brain injuries (TBI), suicide, and safety helmets (vs hard hats) have or have not impacted the survey's participants.

Upon review of the literature related to the Auxiliary section noted above, this author contacted two respected mental health professionals in the St. Louis area to seek their input and obtain face validity. (These two professionals also provided input on the survey used in the PSU so there was no need to have them review material they already commented on.) Each of these professionals responded with constructive feedback that was taken into account and utilized to finalize the survey instrument prior to its launch.

Once the survey was finalized (See Appendix A for the Auxiliary section and refer to the March 2021 article for details of the first three sections of this survey) the author moved to Step 2, wherein no less than 12 training coordinators from at least three states were contacted. Upon agreeing to distribute the survey, this author sent a SurveyMonkey link with instructions to these willing coordinators via email. The majority of the survey participants came from the following trades' training programs: Plumbers and Pipefitters (P&P), Laborers, Roofers, HVAC Techs, Floor Layers, and Millwrights.

Sample Population & Data Collection

The SurveyMonkey link was sent to various trades' coordinators across several weeks from the first week of October 2022 through the first week of November 2022. The breakdown of responses from these apprentices were as follows:

Trade	Percent	Count
P&P	33.3%	32
Roofers	20%	19
Floor Layers	17%	16
HVAC Techs	11%	11
Millwrights	9%	9
Laborers	9%	9
TOTAL		96

Data Analysis

Although 103 apprentices responded to this survey only 96 were determined to be eligible of which 95 participated for most of the survey instrument. The survey questions were placed into four appropriate categories. Survey questions 1-8 dealt with Demographic issues, questions 9-28 focused on General and Specific matters related to wellness and well-being, and questions 29-42 made up the fourth category called Auxiliary. Most of the questions from 9-42 were placed on a Likert scale. Questions 9-13, 23, 24, 26, and 27 had a scoring range from 2 (Never) to 1 (Rarely) to -1 (Sometimes) to -2 (Often). While questions 15-22 and 25 had a scoring range from -2 (Never) to 2 (Often). Survey question 14 was in a Yes / No format with a respective scoring range of -2 / 2. Survey question 28 allowed for each reply to equal 1 except for Don't Know (-1). Finally, survey questions 29-42 represented a new category. Therefore, there was no means for comparison to US apprentices in the PSU in 2019. Most of these questions were in a Yes / No format. Survey questions 30-34, 36-39, and 41 had a scoring range of 1 / -1 while question 29 was -1 / 1. Survey question 35 used skip logic based on a Yes reply in question 34. Survey question 42 also used skip logic based on a Yes reply in question 41. Both survey questions 35 and 42 dug deeper into where an "event" happened.

Both data sets were analyzed using a T-test for independent samples and the FIG model (Gaal, 2021). While the T-test for independent samples allows for comparing two groups (i.e., experimental and control) that are independent of one another (Ravid, 2000), the FIG model provides for quantifying Likert scale responses—via an algorithm that calculates weighted averages—to applicable survey questions.

Part One: Demographics

In this FUS, 92% (88: raw count) of the participants surveyed were male (See Figure 1). While seven percent (7) were female and one percent (1) replied in the "other" category. This compares to the 98% (48 of 49) of the participants claiming male gender in the PSU. Nearly 76% (72) of these participants were in the 20-34 year-old age range versus 78% from the PSU. Approximately 81% (78) of these participants were Caucasian, nine percent (9) African-

American, and six percent (6) were Latina/o/x versus the 60% Caucasian and 18% African descent in the PSU. While 49% (47) of these participants live in Missouri, 47% (45) live in Illinois compared to the 94% living in Missouri in the PSU. With regards to one's domicile, 40% (38) of these participants live in a suburban setting compared to 53% in the PSU. The trade breakdown of survey participants was provided in the section above. In this FUS, 56% (54) of the participants have served more than one year but less than three years versus 78% in the PSU. Only seven percent of these apprentices work in the residential sector compared to the 72% in the PSU. Note: In the FUS, this section was expanded by one question due to the fact the PSU only studied one trade and herein multiple trades were examined. Note: One question was added to this section in the FUS to determine trade performed (This was not necessary in the PSU as it only surveyed carpenter apprentices).

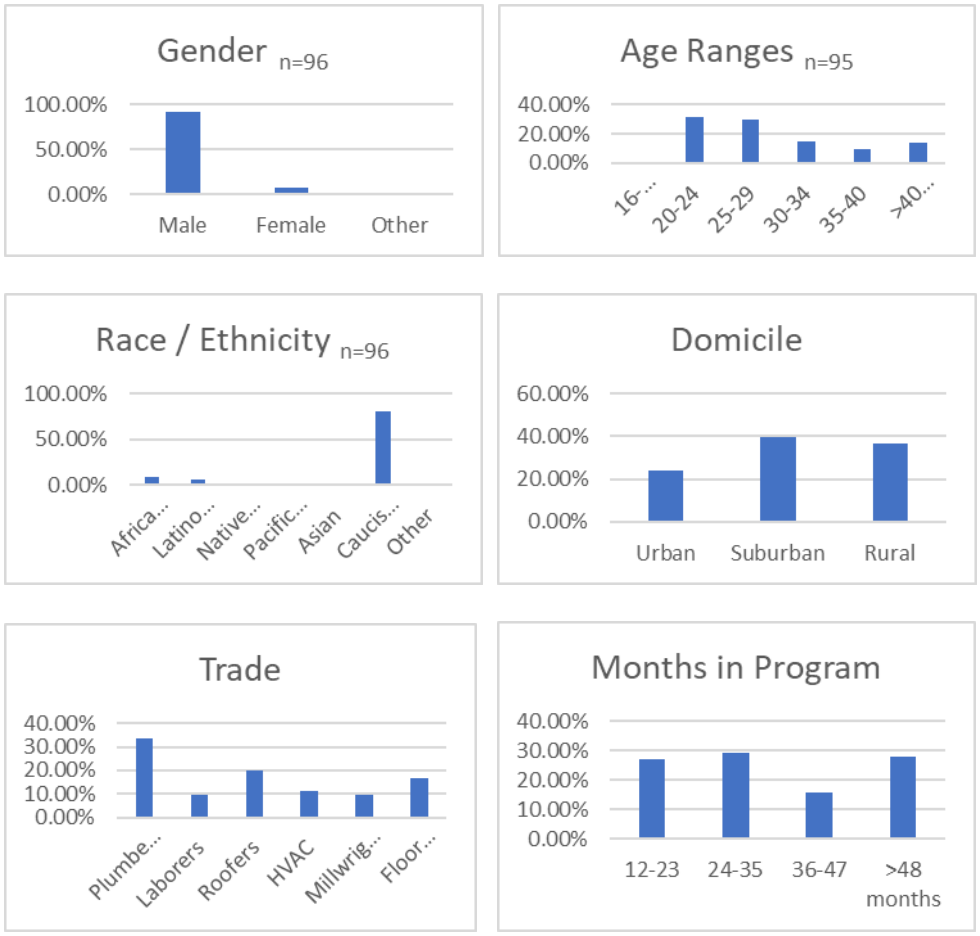

Figure 1.

Parts Two & Three: Key Indicators

An examination of the FIG scores (See Appendix B) allows one to compare and contrast the differences between the two groups on a weighted/proportional basis with respect to work-life balance issues: General and Specific. As noted above, the FIG model utilizes the Likert scale with values ranging from Never to Often. Survey result sub-totals were then multiplied by assigned values established above and then totaled.

Once the FIG total scores were calculated, this researcher used these results to determine the T-test scores for independent samples. The PSU apprentices were assigned as the control group and the FUS apprentices served as the experimental group. The result of this calculation was that a significant difference did exist between these two means (See Appendix B).

Although a significant difference between these two groups can be observed from an aggregated context, this researcher feels it is still worth further examining differences at a more granular level by converting the qualitative data into quantitative data via the FIG model. As such, numerous survey questions between 9-29 are worth grouping and exploring. Several notable observations are as follows:

Regarding survey questions 9, 18-20, and 25, one can see that over 84% of the participants Sometimes to Often eat unhealthy foods; more than 45% exercise Rarely to Never; over 85% Rarely to Never meditate; more than 45% Rarely to Never get 7-8 hours of sleep; yet, over 80% Sometimes to Often spend quality time with family and friends; however, less than 7% Sometimes to Often taken a Sick Day due to stress, etc. (See Figure 2).

Figure 2

With respect to survey questions 10-14, over 60% of the participants use tobacco products Sometimes to Often and more than 35% use alcohol Sometimes to Often. Meanwhile, over 95% of the participants Rarely to Never take prescription pain killers; nearly 100% Rarely to Never take someone else's pain killers; over 90% indicated that they have not self-medicated with illegal drugs (See Figure 3).

Figure 3.

Regarding survey questions 15 and 16, more than 85% and 90% of the participants, respectively, Rarely to Never have sought physical or mental forms of therapy. Meanwhile, when one observes survey questions 17, 23, 24, 26, and 27, one can discern that over 85% of the participants Rarely to Never have been exposed to stress management trainings; more than 45% Sometimes to Often feel stress/anxiety due to mistreatment in their program (i.e., jobsite, union hall, and/or training school); over 20% Sometimes to Often feel stress/anxiety due to unsafe job conditions; more than 20% feel stress/anxiety related to their future job assignment; and more than 40% feel stress/anxiety due to lack of money (See Figure 4).

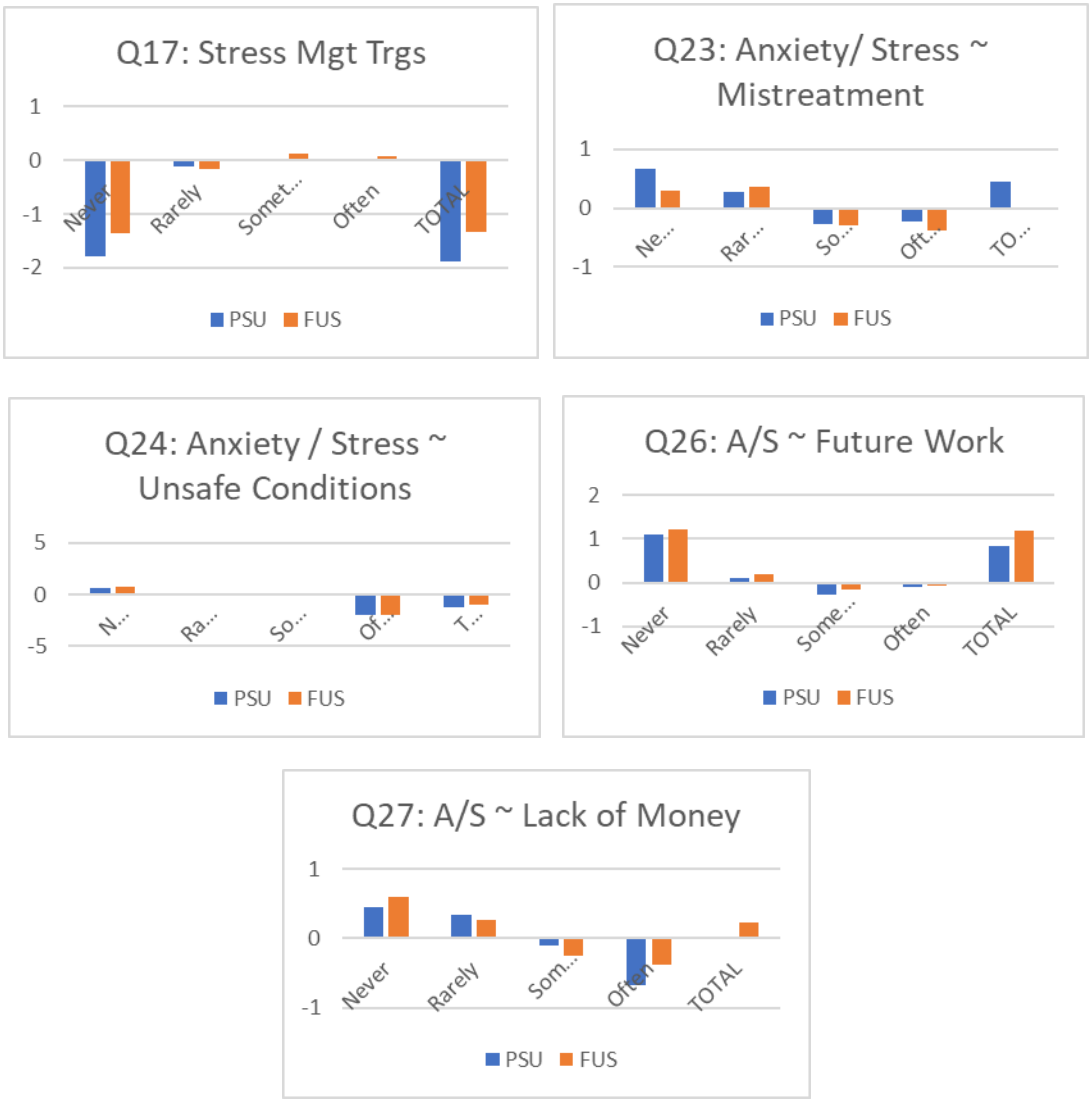

Figure 4.

Regarding survey question 28, only 2% of the participants would utilize their Employee Assistance Program/Member Assistance Program (EAP/MAP) to seek help with stress/anxiety while over 30% indicated they Don't Know where they would turn (See Figure 5).

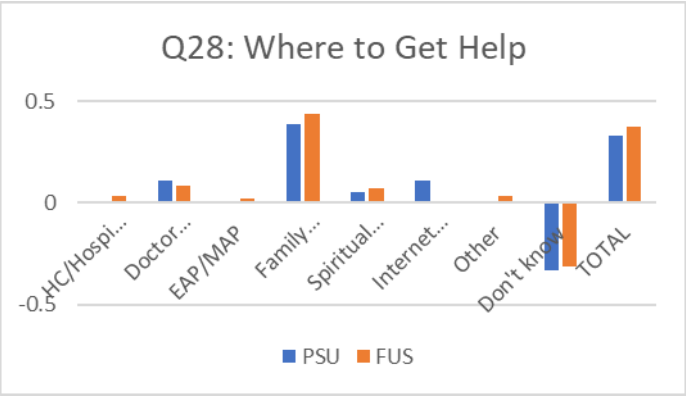

Figure 5

Part Four: Auxiliary

As noted earlier, this section was added to the FUS since the PSU was performed prior to COVID-19. Therefore, only raw data was collected with no means for comparing an experimental group to a control group. Regarding survey questions 29-33, over 30% of the participants were diagnosed or tested positive for COVID; slightly over 50% received at least one COVID shot; of which, only 31% of those received at least one booster; while over 85% know of someone who had/has COVID; and less than 25% know someone who died from COVID (See Figure 6).

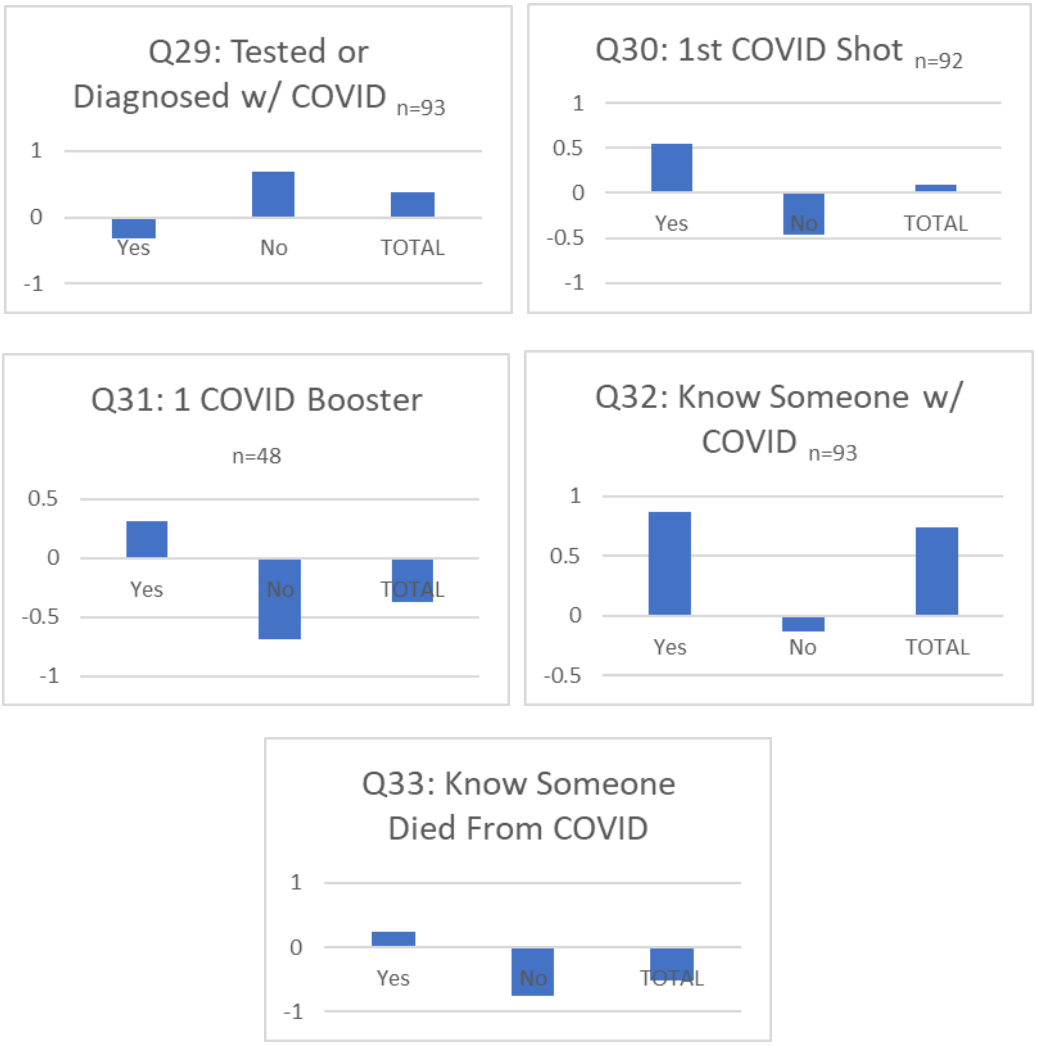

Figure 6

Survey questions 34-35 addressed concussions/traumatic brain injuries (TBI), wherein, over 20% of the participants suffered at least one diagnosed concussion/TBI and of those 50% were related to Sports, 25% to Vehicle accidents, 20% Other, 5% to Military, and 0.0% to work (See Figure 7).

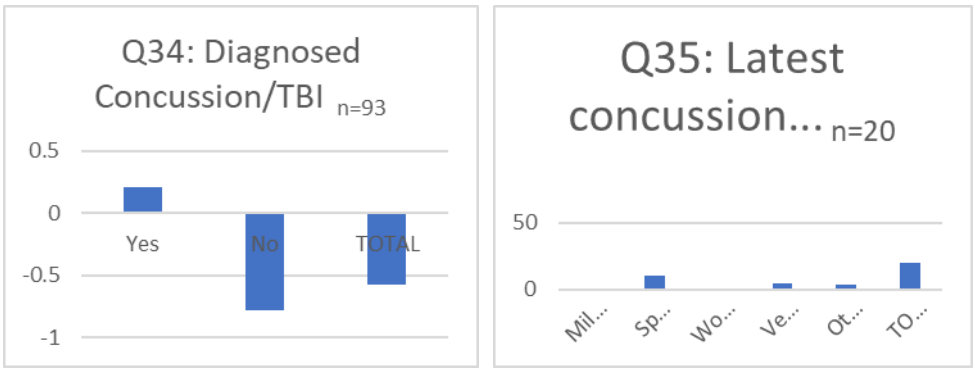

Figure 7

Regarding survey questions 36-40, over 20% of the participants have been diagnosed with anxiety / depressive disorder; slightly less than 20% have had suicidal thoughts; nearly 60% know someone who died by suicide; less than 20% have been diagnosed with a disorder related to a traumatic experience and of those over 30% was due to loss of a loved one; 25% was related to child abuse; 12% was related to substance misuse, and 12% was related to School (i.e., bullying) (Figure 8).

Figure 8

Survey questions 41-42 pertained to the use of safety helmets versus hard hats. Nearly 25% of the participants indicated that they had used a safety helmet on a jobsite. Of those, over 70% indicated that they would use a safety helmet if proven to be safer than a hard hat (See Figure 9).

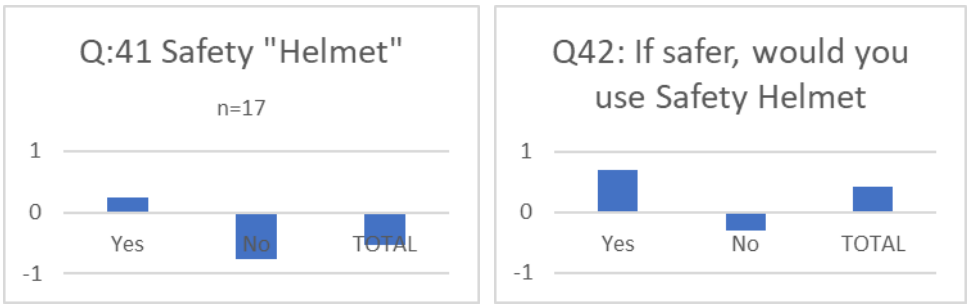

Figure 9

DISCUSSION

Regarding the research question: With respect to work-life balance, wellness, and well-being issues, is there a significant difference between the apprentices surveyed in this FUS and the US apprentices surveyed in the PSU (Summer 2019)? From an inferential standpoint, there is a significant difference between the means in the PSU and FUS (See Appendix B). Be that as it may, the results of the FIG model allow one to quantify the qualitative data and in turn view these disaggregated data at a more granular level. By doing so, one can observe that apprentices from both studies may not be receiving the attention required to establish a healthy work-life balance, wellness, and well-being in their own lives. This is further substantiated by materials covered in the literature review above.

Topics covered under Figure 2 have gained more attention since the beginning of COVID. As noted below:

- MEDITATION: Welch (2022, para 14) posits, "Managing stress is important for overall mental health. One way to do this is practice meditation."
- SLEEP: Janin (2022, para 4) reports that, "Teens who don't get enough sleep are at heightened risk of mental and behavioral challenges…."
- SICK DAY: Chen and Smith (2021, para 11) note, "Burned out employees are 63% more likely to take a sick day, and nearly three times as likely to be actively seeking a different job…."

A major topic covered under Figure 3 is the use of pain killers (i.e., opioids). One subject that has received lots of attention over the past decade is the shortage of skilled workers in the US construction industry. While this author worked as a consultant with the University of Missouri-Extension to help develop a Recovery Friendly Workplaces (RFW) framework, one of the principal investigators shared data from their sister department's research arm which indicated Missouri currently had approximately 29,000 working age people in opioids use disorder/ medication assisted treatment (OUD/MAT) recovery of which 3,800 of those were construction workers (D. Swanson, personal communication, March 17, 2021). Although RFW efforts have taken root in several states, stigma across the community still remains. As such, Walentick,

(2022, para 4) states, “Employers can play a significant role in reducing that stigma, looking beyond someone’s history with substance use and addiction to see the potential value they can bring to a workplace.” A major RFW goal is to develop a framework that brings workers in OUD/MAT recovery safely back to the office, shop or job site. More specific to the construction industry, Dale et al. (2022, p. 3) recently developed the following:

> These guidelines were created to help employers, unions, and union health funds evaluate the opioid prevention supports offered within their organization, and aid the development of a comprehensive plan of opioid prevention policies, benefits, and programs for employees to reduce their risk for developing an opioid use disorder.

Stress is the main emphasis covered under Figure 4. As noted in Figure 2 above, managing stress is important for one’s mental health. Too often, workers are expected to do more with less. As a result, creating a tense atmosphere. No amount of yoga or meditation will overcome serious “cultural” deficiencies in the workplace. More recently, the tables have been turned, and now employers are being tasked with examining their work environment in order to develop more worker-friendly workplaces. As such, Chang (2021) explains the NISOH Worker Well-being Questionnaire (WellBQ) and how its five key pieces are interrelated:

- Work evaluation and experience
- Workplace policies and culture
- Workplace physical environment and safety climate
- Health status (including mental)
- Home, community, and society

Although there was an improvement from the PSU to FUS results for Figure 5, much work is still required to address the need to meet workers where they are when it comes to seeking assistance for mental health. Kinney (2022, para 6) purports that if management wants to see employees utilize their employee assistance programs (EAPs) more, then management needs to better communicate the confidential nature of their program as well as “focus on creating accessible, inclusive and community-driven EAPs.” (Note: In the union sector these are referred to as Member Assistance Programs: MAPs)

As noted earlier, the Auxiliary section was added to this research project to capture the impact of issues arising or becoming more prominent since the launch of the PSU in 2019. Topics covered under Figure 6 suggest a clear split in being vaccinated despite participants having had COVID, knowing of someone with COVID, and/or knowing someone who died from COVID. Seeing resistance, the St. Louis Construction Forum developed a series of short videos to encourage fence-sitters to get vaccinated. Accordingly, Finan says, “Here’s the information, here's the science, and here’s the emotional appeal from your colleagues (Simpson, 2021, para 5).

With respect to Figure 7, concussions and/or TBIs have garnered more attention in the past few

months especially after the world witnessed an NFL quarterback get concussed twice and still be allowed back on the field. Foster (2022, para 4) reported, "Tagovailoa's injury, which was the second time in five days he left a game injured, pushed the NFL and the National Football League Players Association to review and update the league's concussion protocol." While the construction industry remains male dominant, it attracts more than just former athletes. Many current construction workers served in the military prior to entering this industry and may been recruited through programs like *Helmets to Hardhats*. Interestingly, Amidon and Lu (2017, p. 2) assert, "More than 339,000 US service members have been diagnosed with TBI since 2001." Meanwhile, Konda (2016, para 1) declares, "From 2003 to 2010, 2,210 construction workers died because of TBI…These deaths represented 25% of all construction fatalities…." As time passes, and more research is performed, links are being made between TBIs and suicide. In fairness to the construction industry, there are leaders (i.e., AGC-MO) who have made suicide prevention a top priority. As such, their products and services are sought by many far and wide (See https://www.agcmo.org/suicideprevention).

Knowing that the construction industry is facing a labor shortage, they have resorted to tactics rarely used in the past which include recruiting formerly incarcerated citizens. Waldschmidt (2022, para 5) exclaims, "Numerous nonprofit and state partnerships have also stepped up to provide pre-apprenticeship programs to prepare inmates for entry into various building trade apprenticeship programs or direct entry into the construction workforce." Importantly, Maruschak et al. (2021, para 2, 9) declare, "Forty-one percent of all state and federal prisoners had a history of mental health problem. Among federal prisoners, whites (44%) were more likely than blacks (17%) and Hispanics (14%) to have a history of a mental health problem." To this end, topics covered under Figure 8 include anxiety/depression, suicide, and trauma. Maholmes (2022), Chief of Pediatric Trauma at NICHD, remarked that adverse childhood experiences (ACEs), especially for people coming from disadvantaged backgrounds, are cause for trauma that negatively impacts one into adulthood and those around them. This trauma may be linked to observing one parent abuse another, seeing a sibling die, lack of adequate housing, etc. As such, this can lead to utilizing coping strategies that include drug misuse which may result in mental health issues from anxiety to suicide. Accordingly, on one hand, Rohlman (2022, p. 1) proclaims, "1 out of every 5 adults have mental illness" and "50-60% of those having mental health conditions get the services they need;" while on the other hand, a few of the many of benefits of addressing mental health include decreased absenteeism, increased productivity, and higher employee engagement.

With regards to Figure 9, high profile projects often are the testing grounds for new/different approaches to longstanding common practices. In St. Louis, a new stadium was recently built to house a new professional men's soccer team. This author was asked to speak about the mental aspects of safety twice on that project in 2020 and 2021. Both times the author observed all people on the site wearing safety helmets…hard hats were not allowed. Recently, this author was contacted by a professional engineer, who is affiliated with the American Society of Concrete Contractors (ASCC) (S. Greenhaus, personal communication, September 12, 2022). The ASCC is currently undertaking a project called *Hard Hats to Helmets* (https://

ascconline.org/Safety/Hard-Hats-to-Helmets). Wherein, there is a concerted effort to transform their sector of the industry and recent polling suggests they are nearly 25% there.

CONCLUSION

The comparative results of this FUS not only indicate that by expanding the diversity of trades, gender, race/ethnicity, and regions, the findings become more generalizable while also showing an overall improvement of BMH issues regarding apprentices from three years ago. However, when one examines the finer details in the groupings under Figures 2-5, it is clear that much work is still required to address the BMH issues apprentices face in their apprenticeship programs. Whether it is more and consistent exposure stress management trainings, developing self-care habits (i.e., mediation, yoga, sleep, proper diet), seeking alternative therapies to reduce pain, or utilizing one's EAP/MAP, the key players within the construction industry must partner to develop wellness and well-being offerings that help recruit and retain tomorrow's workforce or be faced with losing these workers to sectors that do so. Integrating BMH into the apprenticeship program may take some work but this author suggests a feat of this nature was tackled 20 years ago: Think OSHA-10 safety.

The Auxiliary section of the FUS provided an opportunity to examine contemporary issues facing white- and blue-collar construction professionals. This instrument allowed apprentices to weigh-in with respect to those related hot topic issues that have become more prominent since the COVID pandemic hit the USA. With no means for comparison to apprentices in the PSU, this author suggests making this section a permanent feature for a future study which would provide for comparisons going forward. In the meantime, actions to address some of these serious issues may take the form of industry-focused peer support programs already underway (i.e., MATES in Construction, Laborers Escaping Addiction Now: LEAN). With a lack of mental health professionals, and some assistance from their local community colleges, it may be incumbent upon this industry (e.g., contractors, unions, and training schools) to develop internal intermediaries to act as navigators on the front lines (i.e., Community Health Workers, Labor Assistance Professionals, etc.). To this end, Samuel (2022) asserts that poorer African countries have made strides in meeting people where they are with lightly-trained laypeople utilizing a model that "…has turned out to be not only cheap to operate and easy to scale, but also incredibly effective for treating issues like depression." In addition, apprenticeship programs should consider collaborating with their local secondary and post-secondary CTE/TVET partner schools to ensure issues of BMH are being addressed and scaffolded in their curricula.

The limitations of this FUS include, but are not limited to, disaggregating and further analyzing the data based on age, gender, race/ethnicity, and trade. In addition, in order to make the findings more generalizable for the North American construction market, there is a need to expand the number of participants and trades as well as include Canadian apprentices.

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APPRENDIX A

SECTION FOUR-

AUXILIARY: Please keep in mind, one or more of the questions in this section may trigger your emotions. If any of these questions become cause for concern PLEASE step out of the room and contact the National Suicide Prevention & Crisis Lifeline @ 988 or text HELP to 741741 to obtain assistance.

Q29: Since Jan 2020, have you been diagnosed by a medical professional or tested positive as someone who contracted COVID-19?

Yes

No

Q30: Have you received at least one vaccine for COVID-19?

Yes

No

Q31: (Skip Logic) If you said YES to the question above, have you received at least one booster vaccine for COVID-19?

Yes

No

Q32: Do you know someone close (i.e., self, relative, friend) who has/had COVID-19?

Yes

No

Q33: Do you know someone close (i.e., relative, friend) who died as a result of COVID-19 related complications?

Yes

No

Q34: Have you ever been diagnosed with a concussion or traumatic brain injury (TBI)?

Yes

No

Q35: (Skip Logic) If you answered YES to the question above, how did your latest concussion (or TBI) happen?

Military

Sports-related

Work-related

Vehicle accident

Other

Q36: Have you ever been diagnosed by a medical professional as a person with anxiety or a depressive disorder?

Yes

No

Q37: Have you ever had suicidal thoughts?

Yes

No

Q38: Do you know someone close (i.e., relative, friend) who died by suicide?

Yes

No

Q39: Have you ever been diagnosed by a medical professional with a disorder related to traumatic experiences (i.e., PTSD, anxiety disorder, etc.)?

Yes

No

Q40: (Skip Logic) If you answered YES to the question above, what type of trauma was experienced?

Military

Accident (Work Related: WR)

Accident (Not Work Related: NWR)

Injury (WR)

Injury (NWR)

Childhood abuse

Loss of a loved one

Substance misuse

Sexual abuse / Violence / Intimidation (<18 years old NWR)

Sexual abuse / Violence / Intimidation (>19 year old NWR)

Work (harassment)

School (bullying)

Other

Q41: Have you ever worked on a construction project that required the use of a safety helmet (similar to a rock-climbing helmet w/ chin strap) instead of a typical hard hat?

Yes

No

Q42: (Skip Logic) If the science indicated that a safety helmet provided better protection than a typical hard hat on the job site, would you be willing to begin/continue using one?

Yes

No

APPENDIX B

FIG Scores

Question	PSU n=18	FUS n=95	
9	-1.1111	-1.1790	
10	-0.7222	-0.3579	
11	0.5556	0.3789	
12	1.5556	1.8842	
13	1.9444	1.9368	
14	1.7778	1.6211	
15	-1.7778	-1.4632	
16	-1.7777	-1.6915	
17	-1.8888	-1.3226	
18	0.1667	0.1505	
19	-1.5556	-1.2688	
20	0.0000	0.2688	
21	1.1111	1.0753	
22	0.1667	0.3118	
23	-0.4444	-0.0108	
24	-1.2222	-1.0108	
25	-1.4444	-1.6452	
26	0.8333	1.1828	
27	0.0000	0.2258	
28	0.3333	0.3763	
TOTAL	-3.4998	-0.5371	
STD DEV	1.204053	1.153386	
Mean	-0.17499	-0.026855	
Variance	1.449743	1.330299	
n	18	95	
N			113
X_1	-0.17499		
X_2		-0.026855	
t			4.8216
$t_{crit\ (.05,\ 111)\ one\ tail}$			1.658

Reject the null hypothesis:

$1.658 < 4.8216$

There is a signif. diff.

OPPORTUNITIES FOR OPEN LEARNING IN TVET

Julian Ng

ABSTRACT

Despite proficiency in many technical fields, many TVET providers tend to be slow to adopt open learning principles and methodologies within their practice. This short article hopes to argue the case for the many opportunities open learning can bring to TVET students and institutions.

Keywords*: TVET, Open learning, online learning, VOOCs*

INTRODUCTION

Traditionally, many Technical, Vocational Education and Training (TVET) providers have shied away from offering open learning opportunities arguing that learning online defeats the purpose of a vocational education which is typically hands-on in nature. Another common complaint is that it would require a huge financial investment to create interactive learning that can meet the demanding needs of today's VET industries. Open learning encompasses activities that broaden or enhance learning opportunities within or without formal education (D'Antoni, 2009). There are many definitions of open learning, but broadly, open learning allows learners the flexibility to choose how they learn from a choice of time, location, instructional modes, accessibility, and other factors affecting the learning process (Caliskan, 2012). This article looks at opportunities presented by open learning methodologies and modes for TVET.

Challenges faced by TVET Providers

The United Nations Sustainable Development Goal (SDG) 4 seeks to increase access to general and technical and vocational education at all levels for all people. Yet, in 2018, nearly 260 million youths and children were out of formal education (UNESCO, 2020). To tackle this, it is necessary to increase availability, accessibility, and acceptability in TVET provision. In general, TVET has an inferior reputation to higher education and is consistently seen as the lesser option (or the last resort) for students who wish to pursue a post-secondary academic path. This negative perception affects parents and their children's motivation and decision-making and is particularly common in developing countries (Tlapana & Myeki, 2020). As university fees soar, TVET provision is being increasingly seen as the only affordable educational option. In turn, the same perception of TVET being a lesser option at government-level means more funding is given to higher education institutions rather than TVET providers (Hanni, 2019). As a result, TVET providers and schools generally are less likely to have the expertise, resources, or finances to develop, acquire necessary equipment and/or implement open learning within their environments.

Learners from socially and economically disadvantaged backgrounds tend to be overrepresented in vocational education and therefore are less likely to have access to the internet or to a personal computer, or to receive support from their parents (ILO-UNESCO-WBG, 2020). To a certain extent, Western European countries have had some success in trying to reframe TVET attractiveness as the development of different dimensions of humanity (Winch, 2013). In fact, the French educational system recognises that individuals should be prepared for their roles as economically active workers as well as democratic citizens (Méhaut, 2011).

In research conducted in 2022, challenges to implementing open learning methodologies may also come from TVET teaching staff. While 100% of male teachers used computers in their teaching practice, only 50% female teachers used ICT-based tools and resources. Nearly 70% of teachers aged 25 or under were highly proficient in the use of technology in their teaching

practice, while only 30% of teachers aged 51 and older demonstrated the same level of proficiency (Ainutdinova, Tregubova, Ng, & Kopnov, 2022).

Moreover, many teachers are unaware of changing pedagogies in terms of open education compared to when students are seated in front of teachers in a physical classroom. For open learning to be effective, the online components must move away from the idea of simply using the internet webspace as a repository for documents (and indeed, PowerPoints). A collection of links of documents to download is merely that – it is not an instructional tool, nor does it efficiently engage with students.

Classrooms that moved to Zoom, Microsoft Teams or similar platforms ran up against a host of issues ranging from privacy concerns to student apathy or fatigue from information overload (Murphy & Waters, 2022; Ebardo, Padagas, & Trapero, 2021). In the latter, it was most certainly due to the inability or ineffectiveness of teachers to engage with their students. Many teachers were left to discover by themselves ways of using technology and software and designing lessons for online delivery without the necessary support from their school management. Research has shown that teachers were woefully under-prepared for this (Scherer, Howard, Tondeur, & Siddiq, 2021).This shows that not all teachers are prepared to design open learning possibilities for their students.

Opportunities for Open Learning.

The COVID-19 pandemic lockdowns forced many TVET providers to reconsider their delivery options for continuity's sake. Many governments and companies have understood the importance of open learning and have thus provided support for this. However, often the education providers rushed to create online courses without having enough time to consider pedagogy, delivery methodology, content, student engagement, and assessment.

During the lockdowns resulting from the COVID-19 pandemic, there were three main approaches adopted by education authorities to maintain educational delivery at a distance:

1. Direct Government intervention/control
2. Agency intervention
3. Individual response

Direct government intervention refers to top-down decision-making where national-level policies are implemented about what solutions and methodologies will be used to implement open learning. Countries that have done so include Turkey, Serbia, Georgia, and Egypt which have overseen or prescribed the technological solutions, and national content creation and dissemination (ETF, 2020). In most countries, the ministries of education have played a vital role in empowering technological companies such as broadcasters and those in telecommunications, liaising with donors, and accelerating the provision of open learning possibilities. A few countries, mainly those in the Caucasus region, immediately authorised

additional spending on education during the pandemic. Some countries went as far as prescribing lessons, platforms, and software.

In other countries, governments assigned responsibility for open learning to **regional authorities and agencies** as a method of multiplying control at a more local level. For example, prior to the recent war, Ukraine adopted a decentralised bottom-up model for its TVET education whereby open learning was implemented by TVET institutions, with the backing of regional training methodological centres. Kazakhstan and Kyrgyzstan did the same regionally, also.

However, in much of Western Europe and even countries like Israel, it was the **individual schools and teachers** who were entrusted with the delivery of open learning based on virtual classrooms, online projects and fostering a closer connection with students and parents. Moldova took the opportunity to test out its TVET reform by requiring institutions to ensure access for students to online learning platforms. TVET providers were requested to conduct remote competence assessment through the creation of a digital portfolio and the completion of an online project (ETF, 2020).

Post COVID lockdowns, research has shown that there is an appetite on the part of students to continue with open learning methods (e.g. at least 84% of students surveyed in Korea). Conversely, the same study showed that only 14% of the teachers wanted to resume in this manner (Kim, Myung, Yoon, Moon, Ryu, & Yim, 2020). In India, 54% of students wanted online learning to continue, but 24% wanted to return to normal classes (Gupta, Dabas, Swarnim, & Mishra, 2021). A United Kingdom survey found that teachers' workloads had increased substantially but less than 50% of teachers felt confident with teaching online (apart from the 76% of Computer Science teachers who felt calmly capable of doing so) (Watermeyer, Crick, Knight, & Goodal, 2021).

What this shows is that there remain many opportunities for open learning in the world of TVET. There may be opportunities in refining the way we create open learning courses, improving the pedagogy behind these courses, changing the mindset of students and educators vis-à-vis open learning, looking at more effective ways of assessing learning, and increasing the flexibility in utilising different modes of learning within one course.

Moreover, the open learning nature allows institutions to attract experts and international speakers from around the world without the expense and hassle of organising international air travel. It allows students in geographically-diverse locations to access the same resources and opportunities, regardless of reason or circumstance, often at their own time and pace. Many platforms have also evolved to include various collaborative features such as interactive virtual whiteboards, breakout rooms, polls and post-it notes that can be launched with a click of a mouse for synchronous classes. These are easy to set up and implement, and the most basic instruments often come with measurement tools.

It is important to point out that open learning is not strictly online only learning. It is more akin to the term 'blended learning,' where online learning tools are combined with face-to-face learning to supplement or enhance the learning, rather than replace face-to-face learning.

Hannay and Newvine (2006) suggest that e-learning alone is not enough and that the finest features of distance learning should be assimilated into the traditional courses to create a 'hybrid' educational environment. These same findings indicate that students prefer online education opportunities because in general it allows them to manage their commitments more conveniently.

In the Pro-VET project, four Russian universities and four Serbian universities carried out research among their stakeholder networks focusing on TVET teachers' readiness to carry out online or open learning. The National Roadmap for the Sustainable Professional Development of VET Teachers in Serbia was drafted as a result of this project (Papic-Blagojevic, 2022). It provides a national-level approach towards getting TVET providers and their teachers ready for modern challenges in teaching and learning, including the need to understand open learning principles and methodologies. Seven Vocational Open Online Courses (VOOCs) were created in Serbia and Russia to help teachers develop themselves professionally by first undergoing some open learning themselves. It allows them to change their own mindsets about online modalities. The roadmap itself is such a success that even one of the VOOCs has been accredited by the Serbian Ministry of Education, Science and Technological Development paving the way for the recognition of similar VOOCs.

CONCLUSION

As open learning was a lesser-explored option prior to the COVID-19 pandemic, the range of possibilities offered by this mode is now wide open. Given that TVET providers no longer have an excuse to avoid open learning principles and methodologies, it is expected that the coming years will lead to an explosion of open learning opportunities. TVET institutions have the chance to stay ahead of the curve, not follow it.

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Publication Guidelines for the

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The *International Journal of Vocational Education and Training* reflects regional contributions and is international in scope. Its purposes are to provide a forum for the discussion of vocational education and training issues and practices; to assist in the dissemination of information on research and practice; and to strengthen the lines of communication among individual researchers and practitioners, institutions, and organizations. In addition, it provides a platform for individual views on relevant issues.

The Editorial Board passed a resolution requiring membership in IVETA in order to publish in the Journal, with effect from Volume 14.2. The Journal publishes feature articles on research, theory, and practice broadly related to international vocational education and training. The largest section of the Journal is devoted to empirical research articles. General articles and research manuscripts submitted for publication should be between 1,200 and 5,000 words in length and should adhere to rules in the most recent edition of the Publication Manual of the American Psychological Association (APA) with the exception of placing tables in-column in the text where you prefer them to appear. Articles should deal with some relevant aspect of educational opportunity such as educational research, evaluation, instruction, teaching methods, policy making, or theoretical discourses related to education and training.

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