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# Article SKILLS GAP IDENTIFICATION OF RAC TVET-Based Curriculum Among Practitioners

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#### Abstract:

The Refrigeration and Air-Conditioning (RAC) Technical Vocational Education and Training (TVET) curriculum uncovered a skills gap that was investigated in this study. In this research, the method of research known as the descriptive survey was utilized. In order to collect the information that was required from the respondents, a survey questionnaire was developed. In addition, the analysis and interpretation of the data involved the use of percentages, weighted mean, and frequency, as well as chi square to determine significant differences. According to the findings, there is a meaningful connection between the respondents' group profiles and their RAC competency levels. In addition to this, the value of P was greater than the threshold for significance. In light of this, it may be deduced that the demographics of the respondents have an immediate impact on the skills of the group respondents. The findings led to the conclusion that the group respondents did not have adequate understanding of both common and fundamental competencies. So, there is still a need for them to develop their abilities and understanding in terms of air conditioning and refrigeration.

Keywords: RAC practitioners, Descriptive Methods of Research, Competency Standards

# 1. Introduction

The growth of our country has led to an increase in the demand for skilled labor, and students who receive a vocational education are better prepared to enter the workforce. There has been an uptick in the private sector's as well as the public sector's demand for qualified workers. Because of the everincreasing need for highly trained professionals, there has been a rapid expansion of vocational education in recent years. During the course of history, there has been a huge explosion in the field of vocational education. In many different areas, including tourism, information technology, banking and finance, retail management, business process outsourcing (BPO), hospitality, and traditional crafts, there has been an increase in the demand for qualified workers (Bardach, 2019).

In addition, persons who participate in technical and vocational education and training (TVET) are more prepared for the working world. It has played Alin (2023). Skills Gap Identification of Rac TVET-Based Curriculum Among Practitioners. Author (s). This is an open term of Creative Commons Attribution License (CC BY). www.wjehr.com



Copyright: © 2023 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license(https://creativecommons.org/licens es/by/4.0/). a particularly important part in delivering to both children and adults the information, experience, and abilities that can lead to an improvement in their overall quality of life (Maclean 2006). The vocational and technical education and training sector is gaining more attention around the world as a result of its potential to raise low-income workers' productivity and incomes, improve job prospects for the unemployed, and make it easier for those who are already employed to transition into new fields (Orbeta and Esguerra 2016; UNESCO 2016).

In the meantime, the European research evaluation of the benefits of vocational education and training (VET) has been published at a time when Europe is taking stock of the success accomplished in the Lisbon process and has launched a new strategy for growth and quick recovery from the economic crisis. It is absolutely necessary to make investments in human resources, such as through education, training, and other types of learning, in order to achieve smart, sustainable, and inclusive growth. The transition toward more knowledge-intensive society will see vocational and technical education (VET) continuing to play an important part. In the year 2020, around half of all employment will require a certificate of a medium level, which is often attained through some type of vocational education and training (VET) (European Centre for the Development of Vocational Training, 2011).

The development of competence-based assessment in the UK has been strongly influenced by the introduction of National Vocational Qualifications (NVQs) and Scottish Vocational Qualifications. The introduction of these qualifications has raised the profile of competence based assessment and, arguably, its credibility. But it is responsible for creating some misconceptions. Attempts to centralize and prescribe criteria and processes have stifled innovation and have restricted the wider application of and involvement in competence-based assessment, particularly at the higher levels. This article describes the background of competence-based assessment and NVQs and identifies some of the misconceptions which exist in this area. Taking the Association of Accounting Technicians as a case study, the article aims to correct these misconceptions and demonstrate the real potential of competence-based assessment in vocational and professional contexts. Further, In the UK, interest in competence-based assessment began to develop in the 1970s. A number of factors influenced the growth of this interest. Unemployment was rising and concerns were being raised about the level of skills in the workforce. Young people, it was argued, were not being adequately prepared for work, and training for working adults was thought to be inadequate (Purcell, 2015).

In the Philippines, the Technical Education and Skills Development Authority (TESDA) is the national government agency managing and supervising the TVET system. It provides national leadership for developing a skilled workforce. It is particularly focused on middle-level skills development (semi-skills, skills, craft, and technician training).

TESDA has evolved into an organization that is responsive, effective, and efficient in delivering myriad services nationwide for TVET such as

standards development, program implementation, assessment, certification, registration, and accreditation. The roots of TVET in the Philippines were established more than 80 years ago, but it has evolved primarily to provide postsecondary and noncredit technical vocational education and training. Those who do not choose to enter higher education often choose TVET to earn a National Certificate (NC) from TESDA, which leads to employment. The certifications are well recognized as nationwide employment credentials and are often required during the recruitment of skilled workers. However, NCs are noncredit and not transferrable to higher education. Additionally, with the country's recent shift to K-12 compulsory education, TVET education was integrated into senior high school through a TVET track in grades 11 and 12 to produce high school graduates with employable skills recognized in the workforce (TESDA, 2016).

One of the major development challenges for the Philippines is to prepare the youth (ages 15–24) for the workforce. The country is still facing low education, high dropouts, and unemployment, particularly among the youth. Technical and Vocational Education and Training (TVET) is the postsecondary education sector, providing noncredit, technical middle-level skills training to produce skilled workers. The Technical Education and Skills Development Authority (TESDA) provides national leadership for the TVET system by implementing competency-based curriculum standards, training regulations, and assessment and certification processes to ensure a high-quality TVET delivery throughout the country. With the country's recent shift to K-12 compulsory education, TVET education is integrated into senior high school to produce high school graduates with employable skills

Moreover, those who do not choose to enter higher education after high school often choose TVET to earn a National Certificate (NC) from TESDA. NCs are well recognized as nationwide employment credentials and are often required during the recruitment of skilled workers locally and abroad, but are not applied or transferrable to higher education. The most prevalent connection seen between TVET in the Philippines and US Community Colleges is through noncredit education. One of the primary differences is TVET's exclusive focus on workforce development programs leading to government-based certifications or credentials. While the majority of noncredit education in US Community Colleges is for workforce training, it is not the only focus, and the function allows colleges to use this flexible delivery method to meet a variety of community needs. While the conditions and educational configurations may differ between the Philippines and the United States, the strong connection made between education and employment is both undeniable and a national priority in each country (Budhrani and Espiritu, 2018).

According to Ermac (2016) the nature of work is changing rapidly due to new technology and work organization innovations. This has a dual effect by tending to dramatically reduce the number of low or unskilled positions available globally and additionally putting emphasis on the need to extend worker's skills over a shorter and shorter time frame. It is no longer sufficient

to only have initial skills in say, a recognized trade as the changing nature of work will require individuals to regularly upgrade their skills or add completely new ones inorder to remain fully employable. Most of this upgrading or addition of skills can be gained in a training centre or within the workplace but irrespective of how competency has been achieved it should be formally recognised in the same way as the initial trade skills. Work or qualification levels across the region skill standards developed in different countries have levels or hierarchies used to group the skills defined. In the Asia Pacific region these are usually based upon occupational classification structures and the particular qualification framework for that country. However, both of these vary considerably across the Asia-Pacific region and worldwide in terms of the number of occupational definitions, levels of qualifications, and terminology used.

Furthermore, Philippine government and DOLE have identified key employment generation and jobs to watch, there still exits a job-skills mismatch (Jaymalin 2016). The Trade Union Congress of the Philippines (TUCP) claims that the job-skills mismatch has been ongoing and has worsened in 2016; new graduates will have difficulty finding immediate employment due to additional hiring requirements and demanding additional qualifications that would require additional training for job applicants. This situation can discourage graduates seeking employment for the first time. However, there are numbers of RAC TESDA graduates who were unable to pass the heating, ventilating and air condition (HVAC) examination (Jaymalin 2016).

Technical and Vocational Education in the Philippines has still in the process of improvement specifically on the curriculum. This study will assess the skills gaps identify by the refrigeration and air-conditioning technicians in Metro Cebu. Thus, this study will be conducted.

This research is anchored on the Refrigeration and Air-Conditioning NC III competencies that a trainer or technician must achieve to enable him/her to install, service, maintain, troubleshoot and repair as well as to perform startup, test and commissioning of air-conditioning and refrigeration units in commercial environment/ establishments other than centralized airconditioning and industrial refrigeration systems. This includes the competencies of basic, common and core competencies. To attain the National Qualification of RAC Servicing (PACU/CRE) NC III, the candidate must demonstrate these competences to achieve the vision and mission of technical and education and skills development in the Philippines and help the next future generation.

The RAC SERVICING (Packaged-type air-conditioning unit / Commercial refrigeration equipment (PACU/CRE) NC III Qualification consists of competencies that a person must achieve to enable him/her to install, service, maintain, troubleshoot and repair as well as to perform start-up, test and commissioning of air-conditioning and refrigeration units in commercial

environment/ establishments other than centralized air-conditioning and industrial refrigeration systems.

The basic competencies refer to non-technical skills (knowledge, skills and attitudes) that everybody will need in order to perform satisfactorily at work and in society and are considered portable and transferable irrespective of jobs and industrial settings. These competencies are integrated with 21<sup>st</sup> century skills, referring to a broad set of knowledge, skills, work habits, and character traits believed to be critically important to success in today's world, particularly in contemporary careers and workplaces. Moreover, common competencies covers the knowledge, skills and attitudes in identifying, requesting and receiving construction materials and tools based on the required performance standards.

Meanwhile, in core competencies, it covers the knowledge, skills and attitudes to safely install the main packaged-type air-conditioning unit (PACU) components and units as well as accessories based on manufacturer's recommendations. It also includes site survey, installation of electrical and piping systems.

In addition, refrigeration and air conditioning technicians' support maintain and help design air conditioning systems, often for large and complex buildings like factories. According to the Whole Building Design Guide, a RAC may also be referred to as a type of mechanical engineer of record. Refrigeration and air conditioning technicians primarily address seven topics: heating, cooling, humidifying, dehumidifying, cleaning, ventilating and electrical.

### **Results and Discussion**

The basic competencies refer to non-technical skills (knowledge, skills and attitudes) that everybody will need in order to perform satisfactorily at work and in society and are considered portable and transferable irrespective of jobs and industrial settings. These competencies are integrated with 21<sup>st</sup> century skills, referring to a broad set of knowledge, skills, work habits, and character traits believed to be critically important to success in today's world, particularly in contemporary careers and workplaces.

Common competencies on the other hand covers the knowledge, skills and attitudes in identifying, requesting and receiving construction materials and tools based on the required performance standards.

While core competencies cover the knowledge, skills and attitudes to safely install the main packaged-type air-conditioning unit (PACU) components and units as well as accessories based on manufacturer's recommendations. It also includes site survey, installation of electrical and piping systems.

#### Figure 1. RAC Competencies



Figure 1 shows the summary of the Level of RAC Competencies of the group respondents. The data revealed that the respondents were well knowledgeable in terms of basic competencies refer to non-technical skills (knowledge, skills and attitudes). This implies that group respondents were fully understand the competencies based on the basic competencies this includes the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements. However, the respondents' knowledge in terms of common and core competencies were tracked as knowledgeable. This implies that group respondents were not yet fully acquire the skills and knowledge of these two. Overall, the RAC competencies of the respondents got an overall weighted mean of 4.08 which verbally described as knowledgeable. Therefore, the data suggest that there is a need for them to continue develops their skills and knowledge on the least acquires competences.

	Degrees	Chi-Square Test of		
RAC	of	Independence	Decision	Rema
Competencies	Freedom	Pvalue Level of Significance		rks
		= 0.05, two- tailed		
			Do not	No
Basic	16	0.069175294 > 0.05	Reject	Signifi
Competencies			Но	cance
			Do not	No
Common	16	0.298442739 > 0.05	Reject	Signifi
Competencies			Но	cance
			Do not	No
Core	16	0.371529384 > 0.05	Reject	Signifi
Competencies			Но	cance

Table 1 shows the significant relationship of the profile of the group respondents and the RAC competencies in terms of basic, common and core competencies. The data revealed that there is a significant relationship between the profile and the RAC competencies of the group respondents. Moreover, the P value was more than to the level of significance. This implies that the profile of the respondents directly influences the competencies of the group respondents. Therefore, the age, educational attainment, trainings and seminars attended and their qualification are necessary to be a competent RAC technician. Thus, the null hypothesis was not rejected. Hence, there is significant relationship.

## Conclusions

Based on the aforementioned findings, it was concluded that the group respondents were not fully well knowledgeable in terms of common and basic competencies. Thus, there is still a need to improve their skills and knowledge in terms refrigeration and air-conditioning. Although, most of them qualified to become a RAC technician but still the data suggest that they need to refresh and

improve their skills and knowledge especially in common and core competencies

## Recommendation

It is recommended that the curriculum revision and continuous professional development of the RAC technicians are highly suggested to improve the learning outcomes of our Technical Education and Skill Development Authority (TESDA) graduates and improve the productivity, skills and knowledge specialization of our RAC technicians. This research study might be deliberated by the TESDA officials, assessors and other stakeholders to revisit different curriculums to measure the competence of our skilled technicians.

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