

Research Article

# Challenges Facing TVET in Saudi Arabia and Road Map to Reform

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## Abstract

TVET Technical and Vocational Education and Training is an important component of several manpower development programs in Saudi Arabia but faces many obstacles which prevent it from fully realizing the government's aims. When a country wishes to reform TVET radically, it is helpful to draw on comparative research on the implementation of new models in other countries and to be informed of any debates regarding these. Detailed review of the literature has been carried out by the author to ascertain the role that TVET plays in Saudi Arabia. The author also identified the most significant challenges which TVET encounters along with critical success factors (CSFs) relating to improving TVET in Saudi Arabia. In addition, the author has examined international TVET practices and thus take advantage of the experiences of other countries, and then has suggested solutions to tackle challenges and to remove them. This study lists various challenges which impact on TVET in Saudi Arabia and ways to overcome them, such as mismatch between the skills of TVET graduates and the labor market, a shortage of good quality training and experience, programs which are not designed to meet the country's needs, enrollment numbers too low, and a general perception of vocational training as being undignified and not prestigious, all issues which date back to the early days of industrial-vocational education in Saudi Arabia.

## Keywords

TVET, TVTC, Saudi Arabia, Challenges, Recommendations, Road Map, Reform

## 1. Introduction

The discovery of oil in Saudi Arabia in the 1930s and its commercialization in the 1970s has resulted in extraordinary economic growth. Unfortunately, labor and human capital development have not kept pace with this economic development [1]. This has led to an influx of expatriates employed to meet demand which cannot be met locally in areas such as manufacturing, information technology and services [2] thus excluding from the labor market the local workforce as they did not possess the necessary education and skills [3]. Issues

such as Saudi Arabia's high level of reliance on oil and the petrochemical industry along with fluctuations in market demand, a continually high unemployment rate together with an extreme dependence on a foreign workforce, and in addition the low number of females in the labor market, all came together to present threats to the socio-economic framework of the country [4]. In order to tackle these challenges, the government has drawn on a range of different techniques and strategies. Unfortunately, economic plans to upskill the

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workforce and enhance economic development and global competitiveness have not achieved the desired results [5]. Yamada, M. [6] claims that the rise in oil revenues between 1969 and 1980 which resulted in an economic boom in Saudi Arabia also had the unfortunate side effect of creating negative attitudes in relation to technical and vocational training. At this time, students preferred university study to technical and vocational training.

The level of spending on education and training in Saudi Arabia is higher than in any other Middle Eastern state [6]; part of this spending is on the provision of free education in public schools, colleges and universities [7]. According to Ramady, M. A. [8], Saudi graduates from tertiary institutions cannot be as productive as graduates with technical and vocational degrees due to the fact that ‘technological progress and the “diffusion” of scientific and technical innovations lead to higher productivity’. Ramady, M. A. [8] also draws attention to ‘a growing imbalance between the quality and quantity of occupational expertise produced by the educational system and the occupational structure demanded by the economy’. Since the beginning of the twenty-first century the Kingdom of Saudi Arabia has endeavored to move towards becoming a knowledge economy and away from its dependence on oil and the instability which this brings with it in order to assure the country of a flourishing and more stable future [9]. The national policy is to reduce unemployment and increase economic diversification at the same time as joining the global drive towards a ‘knowledge economy’ [10].

A significant component of Saudi Arabia’s overall strategy to reduce unemployment and diversify the economy is its spending on TVET [11]. In order to move from Saudi Arabia being so dependent on oil, the government has introduced important economic and financial reforms to and bring the private sector and technical and vocational training (TVET) to the fore [12]. TVET as a solution to the issue of lack of skills locally has been widely recognized by practitioners, policy-makers and researchers as having a great deal of potential [13, 14]. In April 2016, Vision 2030, the Kingdom’s economic plan, was announced. One of the key elements of the plan is to make the Kingdom’s economy more sustainable by reducing its dependence on oil by 2030 [15]. Rivera, N. [16] consider that the Vision 2030 plan includes a chain of strategic objectives that can be directly linked to the use of vocational training and education to deliver needed technical skills in a way which also supports life-long learning, and which keeps educational outputs abreast with the requirements of the labor market, encourages vocational training to respond to the needs of the market, and allows young people to be better prepared to enter the labor market.

TVET in Saudi Arabia is facing many obstacles which prevent it from fully realizing the government’s aims. Although Saudi Arabia is a high-income country, its TVET sector is still developing and is less established than other countries in the same income group [16]. Lauglo, J. [17] suggests that when a country wishes to reform TVET radi-

cally, it is helpful to draw on comparative research on the implementation of new models in other countries and to be informed of any debates regarding these. Thus, it is essential that detailed research be carried out on these to ascertain the role that TVET plays in Saudi Arabia and to characterize the most significant challenges and obstacle along with suitable solutions, and thus take advantage of the experiences of other countries. Ultimately, this article aims to respond to the following questions:

- 1) What are the most significant challenges and obstacle facing TVET in Saudi Arabia?
- 2) What specifically are the main practical solutions and recommendations to tackle these challenges and obstacle?
- 3) What are the critical success factors (CSFs) relating to improving TVET in Saudi Arabia?

In order to answer these questions, we carried out a literature review that focuses on TVET in Saudi Arabia. The author undertook a detailed review of the literature, particularly of studies on TVET in Saudi Arabia, and interviews with experts, managers and TVET practitioners in Saudi Arabia, in order to identify the most significant challenges which TVET encounters along with critical success factors (CSFs) relating to improving TVET in Saudi Arabia. In addition, the author has examined international TVET practices and has suggested solutions to tackle challenges and to remove them. Broadly speaking, this process took the following basic steps:

- 1) Undertaking a detailed review of the literature.
- 2) Finding relevant literature.
- 3) Selecting and filtering the literature.
- 4) Summarizing and analyzing the literature.
- 5) Validate the result by conducting interviews with key management in TVTC.

The next sections examine a background about TVET in general and TVET in Saudi Arabia. Furthermore, this paper summarizes the most significant challenges in technical and vocational training and presents solutions and recommendations to tackle these alongside CSFs, with the goal of improving TVET in Saudi Arabia.

## 2. Research Method

Prior research offers an indispensable source, it covers a collection of related data which has been brought together and examined in other studies, thus contributing an invaluable supply of knowledge. It is made up of raw data that has not been processed before and of compiled data which has previously been abridged or analyzed [18]. For this reason, literature on TVET was reviewed in order to obtain preliminary data and then to gain the recommendations. However, a literature review alone was not sufficient to provide all that was wanted for the first phase of this study; also, the literature review presented that there was insufficient data on TVET in Saudi Arabia, where the literature review showed that there was a gap in the research, so the research review was extended

and acknowledged farther papers. Following the completion of the literature review and identified the gap, the author decides on to address the gap by conducting a field pilot study to understand and assess the current situation more deeply, and precisely, this pilot study aimed to validate the identified challenges facing TVET in Saudi Arabia. The data collection method selected for the pilot study was interviews, which provided the data needed on challenges facing TVET in Saudi Arabia. Interviews allow holistic insights on the issue under scrutiny to be gained through face-to-face discussions with specialists and practitioners [19]. The semi-structured interviews were carried out with experts, managers and TVET practitioners in Saudi Arabia. In semi-structured interviews, the text of the questions can be altered, and further clarifications sought and offered. These Semi-structured interviews were conducted for two reasons:

- 1) First, to gain the data required about challenges facing TVET in Saudi Arabia and the key recommendations and road map.
- 2) Second, to understand if the results of the literature review were borne out in practice by these knowledgeable personnel and if there were further challenges not identified in the literature review.

The author carried out the pilot study in June 2023. The interviewees were questioned on their most common challenges and the recommendations. Eight interviews were conducted before saturation was reached. Interviews were only conducted with persons who had substantial experience in the area of TVET. Questions were asked on challenges in TVET in Saudi Arabia and possible explanations for these issues. In the final interview stage, the author used a prompting technique to draw the care of interviewees to challenges that had been identified by other interviewees or in the literature. This prompting technique helped to confirm the significance of such challenges. Semi-structured interviews enabled the interviewees to progress themes and offer wider perspectives on issues and challenges for TVET in Saudi Arabia. These interviews further validated the data obtained from the literature review, while adding important elements.

### 3. Background to Technical and Vocational Education and Training (TVET)

Vocational education is an important part of development as it allows the potential of both individuals and the society in which they live to be unleashed, their horizons to be expanded, and makes it possible for them to adjust to the changing world [20]. Vocational education differs from general education in that it is not a single system but is broken up into different responsibilities and is undertaken by 'a wide range of training institutions including state, non-governmental and private providers, each with differing interests, administrative structure and traditions' [1]. Nev-

ertheless, the place of general education cannot be taken by vocational education as each play a role in developing as well as developed nations and must help to provide platforms for individuals to develop their knowledge and skills, and both are necessary for a nation to thrive. Indeed, many prominent global NGOs and organizations, for example the World Bank and the United Nations Education, Scientific and Cultural Organization (UNESCO), recommend TVET as a means of supporting economic growth, alleviating poverty, and improving the competitiveness of nations [21]. Lauglo, J. [17] considers that TVET policies overall should target a variety of different groups ranging from young people who are still in school and with generally little experience of work outside of the house, through individuals in employment who require on-the-job training, to those who aim to become self-employed. Furthermore, other groups such as the jobless, those with disabilities, the economically disadvantaged, women and girls, and underserved ethnic groups are often singled out as needing special attention for reasons of equity.

Vocational education is generally known as Vocational Education and Training (VET) or Technical and Vocational Education and Training (TVET) [22]. Indeed, it can be seen in the literature that the terminology differs in each part of the world. Many terms have virtually the same meaning and bring together both concepts of 'technical education' and 'vocational education, although the concepts have only been combined fairly recently, with economic, societal and educational considerations impacting on how the original concept (vocational education) was defined [23]. It was agreed in 1999 at the Second International Congress on Technical and Vocational Education in Seoul and at the 30th session of the General Conference of UNESCO in Paris that 'Technical and Vocation Education and Training' (TVET) should be adopted internationally as an appropriate expression which conveys the concept of a combined process of education and training with the ultimate goal of preparing those being trained for employment [24]. For this reason, the acronym TVET is used throughout this study for all training which can be categorized as technical and vocational education.

### 4. Background to TVET in Saudi Arabia

Alaki, M. A. [25] considers 1949 to mark the birth of industrial-vocational education in the Kingdom as it was then that the first school for this type of training was opened in Jeddah. This grew to a total of 8 similar schools by 1960, with a total of 1,259 students. In the same year secondary industrial-vocational education began in Saudi Arabia when the al-Riyadh Secondary Industrial School opened. In the early days of TVET in the Kingdom, three governmental agencies shared responsibility [1, 24, 26]; the Ministry of Education ran industrial, agricultural and trade high schools, with the Ministry of Municipality and Rural Affairs running Institutes of Assistants, and the Ministry of Labor and Social Affairs

responsible for vocational training [5, 26]. In 1980 male vocational education was organized into the General Organization for Technical Education and Vocational Training (GOTEVT) [1]; [5] which brought together all responsibility for vocational and technical training [26]. The aim was that GOTEVT would act as a government body which would develop vocational training and technical training programs in Saudi Arabia which would provide the vocational educational training programs necessary to fulfil the nation's manpower requirements and to allow development at all levels to take place [27]. Baqadir, A. A. [27] lists the following as GOTEVT's areas of responsibility, as laid down by the charter of the Royal Decree:

- 1) To cover technical education in all areas of agriculture, commerce and industry.
- 2) To cover vocational training at all levels, for example adults striving to enhance their vocational qualifications, people starting or preparing for occupational training, and individuals already in work.
- 3) Research and technical studies designed to broaden the competency and effectiveness of the national workforce.

As well as the three areas listed above, GOTEVT also introduced vocational and technical training in areas which were not covered by other government agencies or where the Supreme Manpower Council required it. Accordingly, GOTEVT's activities were split up into vocational training and technical education as detailed below.

- 1) Vocational Training: this is made up of pre-vocational training to give candidates the specialized training needed to enter an occupation or to enter a vocational Training Centre for training, vocational training for adults and young people, on-the-job training coordinated with private companies or public bodies, training for vocational teachers and creation of teaching materials and training programs.
- 2) Technical Education: this takes place in industrial secondary schools, commercial secondary schools, agricultural secondary schools, and polytechnics (intermediate technical colleges) [27].

In 2005 the Technical and Vocational Training Corporation (TVTC) replaced (GOTEVT); TVTC also expanded its activities to include female as well as male trainees [5]. TVTC is responsible for providing vocational and technical training in 286 institutes across Saudi Arabia and also monitors training in 1203 institutes in the private sector [28].

## 5. Challenges and Limitations Facing TVET in Saudi Arabia

### 5.1. Keeping TVET Outputs in Step with the Labor Market

Mismatch between the needs of the Saudi Arabian labor market and the skills of current TVET graduates is a significant

challenge for the Kingdom's current technical and vocational training. This mismatch has resulted in a reduction in private sector capabilities because of poor skill-matching job creation policies [29]. Taweel, M. [1] also highlighted as the greatest challenge relating to the development of human capital its difficulty in supporting the local labor force in developing the skills, which would bring supply and demand into alignment. Lauglo, J. [17] holds that TVET policies must be driven by labor market demand; furthermore, Alagaraja, M. [30] consider that a more detailed analysis of the association between labor supply and market demand is essential. By linking acquiring skills to present and predicted demand, TVET will be able to minimize this discrepancy between needed skills and one's available [1, 14, 31, 32].

Lauglo, J. [17] consider that it is essential to use feedback on TVET from the labor market to bring about modifications which meet the labor market's demand for skills. However, it has been very challenging to obtain accurate data on the labor market in the Kingdom. Although there is overall agreement on priority areas, efforts by different governmental agencies are not coordinated. Furthermore, there is no integrated labor market information system which can methodically monitor and evaluate programs, which further hinders evidence-based planning. Hence it is vital that the integration of systems, policies, and governance structures in the skills sector includes all stake holders. Some countries have created 'labor market observatories' in an effort to reduce the gap between the availability of skills and labor market needs. According to Lauglo, J. [17] many of these observatories aim to provide up-to-date and relevant national, regional and local data which TVET can then act on to provide 'outputs' adjusted to changes in the labor market. Furthermore, some countries have brought together panels of employers from sectors with skills shortages to offer advice on TVET rather than solely relying on surveys and statistics [17]. It becomes clear that all decisions and policy directions regarding TVET need to be correlated with the needs of the labor market. It is necessary to keep track of trends in the labor market to be able to make reliable decisions on policy and curricula which are founded on sound evidence [5, 16]. Fostering a skills development system based on a reliable information system will also help to bring about a culture of governance structures and decision-making being driven by evidence.

### 5.2. Increasing the Attractiveness of Vocational Education and Training

Tchibozo, G. [33] states that basically TVET will be attractive when people are properly informed about it, when they believe it to be a valuable option, and when they view it and TVET graduates favorably. Unfortunately, in spite of investment and growth in TVET, the youth in Saudi are not reacting as had been anticipated, with one study reporting up to 94% favoring an academic route [34]. The Saudi government's

educational plans can only succeed if there is a more positive perception of TVET [4, 8]. TVET is often considered to have a lower standing than professional education, no matter what capabilities or leanings which a student may have [22, 24]. As Sultana, R. G. [35] observes, a considerable stigma is still associated with TVET. Scholars and analysts frequently link this to the traditionally negative perception of manual labor in Saudi Arabia, the lower value given to a vocational certificate [5] and this discourages students from enrolling in vocational education, an issue that is emphasized in much of the literature [36]. Another cause of the lack of interest in technical education was that starting out on the vocational path, which usually happens at the age of 16, basically ruled out the possibility of going to university which is the wish of most students [16, 25]. One of the only possible options for young people who have no access to university is the vocational 'middle diploma', if there is capacity. A further element which impacts on the attractiveness of TVET is that the vocational training institutes are seen as being of an inferior quality. Puckett, J. [37] comments that TVET institutes have inferior infrastructure compared to traditional education institutes and have fewer funds available for teacher training, developing their curriculum and for the equipment students need to develop their skills.

Rivera, N. [16] point out that in Saudi Arabia, numbers of enrolled students have risen but numbers of students finishing their course have dropped. Unfortunately, young people frequently drop out of their training program or do not take up employment in the field in which they have been trained, meaning that the investment in training is wasted [24]. Students may have no great interest in TVET but may have entered it because they have been unsuccessful in applying to university, and they may immediately leave when they receive an offer from a university, or another educational door opens. It is essential that education systems include well-defined route for TVET students to keep learning and advancing their career or to transfer into higher education or further training [5]. Almoaibed, H. A. [5] further asserts that the vocational option must be supported and improved, and that it should be possible to progress to higher education at all universities and not just in College of Technology (COT) as is the case at present. Another issue which must be considered is that industrial secondary schools must be regenerated and set up so that they can offer pre-university students suitable programs. The literature has suggested replacing the existing names of institutes with more appealing names which reflect the link with technology and improve their image. Timberman, L. [38] pointed out that the American Vocational Association had replaced its previous name with the Association for Career and Technical Education. In New Jersey student registration increased in half the vocational schools that had new names.

### 5.3. Equal Access to TVET

Key to TVET succeeding is that learning must be provided which empowers students to learn independently and to draw

on their learning to affect change in the workplace [39]. Vision 2030 recognizes that there are limitations in the delivery of training, and advocates for the expansion of TVET by increased investment in human capital. Although training will aid in tackling lacks in employability and will encourage young people to remain involved, such training is much less widely available in Saudi Arabia than it is in many other high-income nations. In spite of many recent campaigns to expand to accommodate more students (women included), there is still a significant shortage of TVET [16]. Almoaibed, H. A. [5] cite harsh admissions requirements in all tertiary institutions as reducing opportunity and choice, with students being forced down from top universities to satellite campuses, to community colleges, to vocational institutes and having to contend with increasingly more restrictions. In addition, because of the limited capacity of TVET in Saudi Arabia, there is unequal access for women, especially in region with fewer training opportunities. Ahmed, M. M. [26] cites the issue of equal access to TVET for women as particularly problematic. The low proportion of women in the labor market has been recognized as an important element in unemployment rates [40].

On the other hand, [17] proposes that TVET should not be limited to young people still in education. Hiebert, B. A. [24] consider that TVET programs should be wide-ranging so as to meet the needs of all and to be universally accessible and it is essential to modify adult training to be ready for the new economy and to have in place systems that are flexible enough to enable workers to acquire new skills at all career stages. Greater access to training may enable more Saudi young people to move into work more readily and mean that they are less likely to be excluded from the labor market.

### 5.4. Curriculum and Skills Development

As an important aspect of quality is fitness for purpose, and as the skills needed from workers do not stay static, it is inevitable that the quality of an academic program will fall over time, and the skills taught will no longer correspond to those needed in the labor market. Lauglo, J. [17] asserts that it is not enough to revise curricula, introduce new syllabuses, or reform education systems; radical changes in ways of thinking are necessary. Lundvall, B. [41] suggest that specific types of knowledge can be especially useful in raising the quality of vocational education training and thus in increasing employment numbers among its graduates. Such knowledge is made up of a wider range of aptitudes which also take into account social skills, as well as the traditional knowledge and skills. Schmidt, H. [39] indicates that English and Mathematics now play a more significant role in vocational training and education than many practical skills, and that information technology (IT) is the basis of the transformation whereby many industrialized nations are becoming knowledge societies. In addition, Rivera, N. [16] point out that new skills are needed in the new economy. Workers must be able to think

creatively, be able to solve problem, work in different types of teams, deal with ambiguity, employ critical thinking, and above all, learn during their entire lives.

Baqadir, A. A. [27] observes that the research shows only little success in efforts to improve levels of vocational skills among Saudi. This disparity between educational qualifications and the needs of the labor force (mainly the lack of 'soft skills' such as problem-solving, leadership and negotiation skills), has long been a cause for concern among educational researchers and private sector employers [27, 42]. According to private sector employers, TVET graduates often do not have the skills and work ethics needed for the jobs on offer. TVET methods do not promote the development of higher-order cognitive skills, but stress rote learning. In addition, there is frequent over-specialization in highly limited areas [16]. Powell, J. J. [43] believe that the expertise needed in the current labor market must be regularly characterized, and the academic offering revised to take this into consideration. Scollard, S. M. [22] holds that vocational training programs need to be reviewed repeatedly and developments in the technologies and processes needed in the workplace integrated. Scollard, S. M. [22] adds that for the academic offering to be appropriate for students taking up work in specific occupational areas, the program must incorporate the current skills needed. It is essential to make sure that TVET keeps step with technological developments in industry [17]. Three elements lie at the center of the skills gap: inappropriate work ethics, lack of specialized knowledge, and a shortage of generic skills [44].

### 5.5. Quality of the Trainers and Administrators in TVET

TVET system in Saudi Arabia is going through a time of transition, with a complete reform of technical and vocational programs. One of the main goals of this reform program is the consolidation of TVET management [45]. As TVET leadership plays a vital role for the sector's economic success, the effectiveness of that leadership is an important variable in the present-day TVET setting [46, 47]. Furthermore, teacher and training programs can only do well if leaders demonstrate their commitment with their activities participation and by allowing the time and finances needed for teacher training [48]. Thus, the delivery of TVET of the highest quality is closely dependent on building up professional management and leadership skills. According to Cedefop, R. F. [48] change can only be brought about in an education institution with the appropriate type of leadership which also supports organizational readiness to maintain quality.

On the other hand, in TVET, the role of instructors is an essential part of supporting students in their developing the skills, knowledge, and experience. Thus, the quality of TVET instructor is the most significant element in creating workers who are both skilled and educated [49]. Indeed, there is a chronic lack of qualified TVET trainers in many countries

[26]. Furthermore, TVET instructors throughout the world lack the in-work training they need to be able to keep up with technological development [17]. This is also the case in Saudi Arabia where this is a major challenge for TVET. According to Phusavat, K. [50], TVET must concentrate on developing and building up instructors' skills. Furthermore, it is essential that an ongoing training program should be launched to strengthen the skill base of technical trainers and enable them to develop themselves. Making use of private-sector expertise and experience allows TVET trainers to be upskilled or re-skilled and enables TVET to be modified according to the developing needs of the labor market [51]. It is imperative that high quality staff are recruited from the private sector, so that TVET can draw on their knowledge and capabilities in both management and training. Furthermore, systems and standards must be put in place to quantify the performance of trainers and administrators, and to recognize areas where they need to develop themselves.

### 5.6. Funding and Centralization of TVET Institutes

One view is that decentralization permits scarce resources to be used more efficiency, enables people to be better motivated, and allows institutions to reach their goals more effectively [52]. It can thus be argued that allowing each TVET institution more autonomy and to engage with local industry will result in TVET becoming more relevant to the needs of local industry and will create a closer correlation between what students learn and the demands of the labor market [17]. This emphasis on local decision-making and on external local 'stakeholders' being involved in these decisions is often accompanied by recommendations to modify TVET funding mechanisms [17]. Taweel, M. [1] cites the centralization of TVET institutions in Saudi Arabia as a major obstacle to their effectiveness as they are not authorized to take decisions locally on strategic matters such as financial management, personnel, curricula, sectors to be involved in, and other matters specific to the local setting, which limits their ability to adapt. Taweel, M. [1] also cited as a further obstacle to progress in TVET cases in Saudi Arabia where its public funding is not linked to performance or outcomes but the main goal of TVET institutions is considered to be quantitative expansion. As public funding is assured, there is no motivation to review curricula and keep them current. This has a major negative impact on the standard of programs and outcomes.

UNESCO-UNEVOC [53] observe that nations are increasingly embracing strategies that look at quality and relevance of training programs rather than budget-oriented funding, which is dependent on inputs, that is utilities, teachers' wages, cost of materials, number of trainees. Puckett, J. [37] task government with making sure that funding is made available for programs in such a way as to enhance the quality of TVET institutions. For TVET to improve and develop,

funding must be related to key performance indicators. To achieve this, all stakeholders must approve key performance indicators such as a high graduate-employment rate instead of indicators such as learner numbers which will result merely in an emphasis on numbers of learners without any consideration of teaching quality or labor market fit. Funding should be distributed according to the performance of the college or institute, with performance assessed regularly. If colleges and institutes were independent, available resources would be fully utilized, greater efforts would be made to enhance delivery and there would be more competition between institutions. In addition, it is necessary to create flexible finance mechanisms that will support the financial sustainability of TVET. Rafi, S. B. [54] advocate moving from customary practices to more of a value-added process which will ensure fiscal sustainability due to less reliance on government funding and increased direct stakeholder participation. For instance, a common approach is to sell short courses to industry or to sell products from TVET institutions' production units (i.e., training with production) rather than being almost completely dependent on ministerial budgets [17].

### 5.7. TVET Relationship with Stakeholders and Private Sector

For continuous economic development to take place, there must be strong links between stakeholders [55] advocate those social partnerships between the private sector, the community and TVET organizations be established so that capacity building can occur at a regional level. These regional partnerships will allow TVET stakeholders to become closely attuned to the particular needs of the workforce and economic policies, and other considerations. These linkages would go a long way towards tackling the frequent mismatch between the demand and supply of skills needed in the workforce which occurs because private sector organizations often do not take this into consideration [30]. Even though employers are those who will finally benefit from TVET, at present in Saudi Arabia there are no channels for industry to communicate with TVET and to give feedback on the content of courses and curricula, and on industry needs. Puckett, J. [37] stress, Because of the acute needs of industry, professionals are in the best position to offer input on the specific skills and capabilities which they are looking for in the TVET graduates which they so desperately need. Industry could work together with TVET providers to produce curricula and potentially provide funding for individual training courses. Apprenticeships could also provide hands-on experience for students and improve employment prospect after graduation.

Furthermore, Rivera, N. [16] believe that overall Small and Medium Enterprises SMEs give employment to the majority of TVET graduates in the private sectors. Roughly 95% of all Saudi businesses are SMEs [56]; however, many SMEs in Saudi Arabia struggle to find suitably qualified Saudi workers, with approximately one in five citing difficulties in recruiting

skilled labor as the greatest challenge to business growth. It is essential to put employers in the position of being able to recruit able Saudi who possess the skills their organization needs to enable the private sector to contribute more effectively to economic growth and job creation, Hence the partnership between TVET providers and the private sector (above all with SMEs). On the other hand, Yusoff, R. M. [57] make the case that the business sector as well as government should take responsibility for implementing TVET. Internationally, many consider that the state should pay attention to the role which private providers of TVET can play. The degree to which private providers supply institutional TVET differs between nations, but in some they play a significant role [17].

### 5.8. Quality Initiatives in TVET

The quality of education is related to the quality of technical institutions providing it. This standard of technical institutions can be assessed in terms of the value they provide to students and teachers [58]. Vision 2030 is made up various strategic objectives on which the existence of good quality, appropriate TVET will positively impact [16]; indeed Vision 2030's third strategic objective is that the TVTC's program should give trainees training of the quality they need to be able to find a good job after graduation. Thus, improving the quality and relevance of TVET is a central concern, and will increase the value, sustainability and impact of the education system so that it can better underpin the nation's economic activity [58]. TVET institutions need to meet quality standards and to have properly governed human and physical resources. Malechwani, J. M. [60] deems the standard of TVET to be a product of the expertise of tutors, the working and learning environment, and the standard of teaching resource inputs. The quality of these will then be demonstrated by the aptitude of graduates and their employability. World Bank's study [16] on TVTC graduates states that present-day Saudi Arabian workers have a higher level of educational attainment than previous generations, but there are still weak learning outcomes due to the inferior quality of the education system. The study shows the restricted supply of the skills needed in the modern workforce is a major limitation to efforts to raise productivity and build the private sector's potential. Sometimes employers have had to retrain new employees in certain specific roles.

The International Labour Organisation (ILO) and UNESCO suggest that national authorities should put in place guidance and standards to guarantee good quality TVET for all facets of TVET. ILO and UNESCO consider that the ratio of teacher to learner, teachers' personal skills, and the standard of the curriculum and educational materials should also be included in these assessments as well as security measures for working and learning environments, physical infrastructure (offices, libraries, etc.) and the layout of laboratories and the standard style of equipment. Considering these challenges, it

is essential for TVET to apply a strong and efficient quality system throughout all its operations, that is in administration, as well as in education and training. This type of powerful quality system must be a part of the conceptual framework to integrate quality assurance into TVET. This means that tools must be used which can adequately deal with such complex issues, strong, efficient tools such as Total Quality Management (TQM), Lean Six Sigma (LSS) and Quality Assurance (QA). Alzamil, Z. A. [61] adds that this improvement which needs to be underpinned by a process framework within the TVTC which will monitor quality assurance and improvement.

## 6. Key Recommendations and Road Map

Saudi Arabia would like to introduce a technical training system which trains students in all the skills required for an economy to be competitive on a global level with sustainable jobs for the entire population. This system needs to be based on planning underpinned by evidence and robust governance, policy and quality assurance mechanisms which are joined up and which bring together all key stakeholders. To achieve this ultimate goal, the following have been recommended:

- 1) Decisions and orientations in TVET must be linked to the needs of the labor market with TVET policies determined by labor market demand. There needs to be a joined-up relationship between supply of labor and the market's demand, and alongside this, the labor market needs to be closely observed and any variations quickly responded to. It will be necessary to consolidate skills development policy, governance and the organization of quality assurance, and monitoring and evaluation processes. Correct information and data are needed to reach the right decisions, so an authority needs to be set up tasked with observing and anticipating developments in the labor market in Saudi Arabia.
- 2) For the Saudi government's plans in the area of education to succeed, TVET must be promoted and backed so that it is more attractive to young people and not considered to be an inferior education option. Attractive programs must be rolled out which are flexible with regards to training methods, targeted students, and time. TVET pathways must become more appealing to Saudi nationals. It is essential that industrial secondary schools are scrutinized and reinvigorated and empowered to offer a range of programs for pre-university students. The Kingdom needs to incorporate technical and professional training into general education.
- 3) TVET needs to reassess its current expansion plans. TVET programs need to be broadly based and all-encompassing, appropriate for all learners. In addition, TVET programs also need to be gender-balanced; it is essential that girls also receive training in all suitable subjects. It is essential to introduce a training system that offers a route to lifetime learning. Adult training must be adapted to the new economic environment by introducing responsive, adjustable systems which will enable workers to acquire new skills during their entire working lives.
- 4) It is vitally important for TVET to keep step with changes in technology in industry. Such developments in politics, society, business and technology demand that the goals of educational systems along with the curricula, qualifications offered, and methods used to be repeatedly scrutinized and modified. Policy-makers need to draw on detailed market research to develop curricula and on input from the education authorities, employment agencies and industry. It is essential for workers to have a firm foundation in a range of skills to be able to adjust to today's challenging professional world.
- 5) TVET leaders must be drawn from both technical and professional worlds. Qualified administrators must be cognizant of labor economics, industry and occupational trends, industrial organization, training facilities, and perceptions of vocational education. Talent from the private sector must be brought in so that TVET can learn from them in both training and in management. A permanent training program for technical trainers needs to be set up. Furthermore, benchmarks and processes must be introduced as measures of the effectiveness of both training and administrative staff and to pinpoint areas in which they need to grow.
- 6) For the TVET to accurately reflect the needs of all involved, it is essential that there is an umbrella organization which collaborates with all those involved to decide on TVET's strategic direction and to agree on a way of accrediting programs. A methodology that could be used in developing TVET in the Kingdom is to set up a TVET legislative authority to be responsible for legislation and to separate this from implementation which would then be the role of technical colleges and industrial institutes. Furthermore, stakeholders from both the public and private sectors could be enlisted to set up executive councils for institutes and colleges to manage their affairs resulting in a closer correlation between the demands of the labor market and the topics covered in institutes. All stakeholders can agree on key performance indicators which can then be linked to incentives, which would result in improvement and development. Finance instruments that are not rigid should be introduced to support financial sustainability in TVET with lower dependency on government funding and with direct stakeholders as active participants.
- 7) There should be a well-defined arena where industry can interact with TVET to offer input on curricula and course content, on training standards, apprenticeships and on any changes in industry needs. The government must pay more attention to the part which private TVET providers perform. In turn the business sector should not leave implementing TVET solely in the hands of the

government but should also take responsibility. Ways to support SMEs should be re-evaluated so that employers are better able to take on talented locals with the skills they need to be able expand and become more effective.

- 8) TVET must implement a quality system that is strong and efficient in all aspects, whether in delivering education and training, or administratively. This robust quality systems should become an integral part of the TVET framework and quality assurance should be an essential component.

## 7. Critical Success Factors (CSFs) to Improve TVET in Saudi Arabia

Critical success factor (CSF) is a term used in management for a feature that a project or organization needs to tackle to be successful [62]. Rockart, J. F. [63] promoted the concept of using CSFs to identify the information needs of managers. As used here, the term CSF denotes elements which are vital in any project for continual improvement. Central to CSFs is that senior management is committed to increasing the competitiveness of the organization. If progress does not take place, the organization will not be able to achieve the desired goals [64]. This makes it imperative that management in TVET organizations fully comprehend the concept of CSFs [62]. Certain structural reforms must take place for TVET systems to be effective and for end users to benefit. The results of Boston Consulting Group's research on education and its relationship to markets indicate that there are four key factors needed for a successful TVET system in general [37].

- 1) A harmonized environment where there is a central coordinating body which oversees the entire TVET system and where all interested parties work together.
- 2) Government funding and support which is based on performance.
- 3) Equivalence of general education and TVETA and a clear route between these two pathways.
- 4) Ongoing cooperation with industry.

Antony, J. [64] list the following three elements which need to be place before TVET can be remodeled:

- 1) Partnership between the public and private sphere;
- 2) Leadership from industry;
- 3) Moving the role of government from administration to facilitation.

The in-depth review by the author and interviews with key management have revealed five key factors for the success of TVET systems, and as vital in enabling a radical change of direction in TVET to take place, with the most critical move being a total overhaul of TVET in Saudi Arabia. The five key critical success factors as follows:

- 1) An organization tasked with observing developments in the labor market and collaborates with all those involved to decide on TVET's strategic direction.
- 2) Development of positive attitudes toward TVET and

providing a clear training pathway.

- 3) An integrated partnership between training providers and the labor market and strengthened relationship with stakeholder and private sector.
- 4) Decentralization of TVET units and performance-based government funding and support.
- 5) Activating quality practices in TVET to raise the quality of training, trainers, administrators and infrastructure.

## 8. Conclusion

An underlying component of the Saudi Vision 2030 plan is that all technical/vocational education systems need to be overhauled so that they are able to deliver on national aims and targets as well as local and worldwide needs. To be able to turn out a high standard of skilled graduates, TVET in Saudi Arabia is in great need of reform and support. At the core of successful restructuring lies the thorough overhaul of all aspects of TVET in Saudi Arabia; this involves revising the curriculum and modernizing modes of instruction, ensuring the most up-to-date and sophisticated technologies and equipment are available, making sure that trainers are highly experienced and upskilled, and involving potential TVET stakeholders and encouraging them to play their part. The present skills shortage results from the gap between the offering of education and training and the demands of the labor market. The development of skills has not been brought into line with the way work is changing as well it could be as the private sector has minimal impact on vocational and technical training or on tertiary education. Issues underlying this are the growing trend towards job automation, and the importance of innovation interacting with the private sector; this pinpoints the need to invest in the areas of science and technology and especially in ICT (Information and Communication Technology). A fundamental requisite to meeting the labor market's tremendous need for 'digital skills', a need which is fundamental to the fourth Industrial Revolution taking place in the Kingdom, is to make appropriate good quality education and training available. The lack of any culture of offering on-the-job learning and development also adds to the challenges faced by any efforts to provide Saudis with options of acquiring new skills or being reskilled or upskilled. It is vital that industry lead in furthering TVET by strengthening a strategic partnership with TVET institutions. Only by involving industry closely in developing, managing and evaluating training will any reform succeed. Key to this is the creation of a solid partnership between all stakeholders including employers, private sector and government.

To conclude, while TVET does not cure all economic ills, advantages can be gained through any efforts to reform TVET systems. It has been observed in states that have upgraded their TVET that the skills gap has been reduced and the skills demands of private sector employers have been better met, there has been lower unemployment, and national competitiveness and productivity have risen. While these improve-

ments are mainly economic, there are additional desirable multiplier effects, for example students are kept in education, poverty reduced, and lifelong learning is encouraged overall. Reforming and improving TVET take a great effort; however, the benefits are well worthwhile.

## Abbreviations

TVET: Technical and Vocational Education and Training.

TVTC: Technical and Vocational Training Corporation.

CSFs: Critical Success Factors.

UNESCO: United Nations Education, Scientific and Cultural Organization.

VET: Vocational Education and Training.

GOTEVT: General Organization for Technical Education and Vocational Training.

COT: College of Technology.

IT: Information Technology.

SMEs: Small and Medium Enterprises.

ILO: International Labour Organisation.

TQM: Total Quality Management.

LSS: Lean Six Sigma.

QA: Quality Assurance.

ICT: Information and Communication Technology.

## Author Contributions

**Fahed Suliman Algassem:** Resources, Data curation, Formal Analysis, Supervision, Validation, Visualization, Methodology, Writing – original draft, Project administration, Writing – review & editing.

**Asma A. Hassan:** Conceptualization, Resources, Formal Analysis, Investigation, Writing – review & editing.

## Conflicts of Interest

The authors declare no conflicts of interest.

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