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How successful is the Industrial Institutes, Kuwait, in reducing dependence on expatriates?

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Abstract. Nowadays, no one can deny the role played by technical and vocational education in reducing the rate of youth unemployment, low rate of poverty, high wages, and livelihood for workers, particularly younger workers. Technical and vocational education is a dual type of educational system that permit students to acquire the necessary knowledge, skills, and attitudes mostly needed by industries and business. The quality of technical and vocational educations would facilitate the transformation of students from classrooms, workshops, and laboratories into real work environment. The success of technical and vocational education in achieving the its objectives would depend on the quality of management in forging a strong linkage with industries and business. The concept of working in a "black box" would not apply in technical and vocational education since industries and business are the main contributors in shaping students' knowledge, skills, and attitudes. Kuwait, as one of the gulf states, the shortage of indigenous skilled and semi-skilled manpower in noted in essential sectors of the economy (e.g., electricity and water and the oil sector). Key figures have appreciated the significant role of technical and vocational institutions in providing essential sectors of the economy with the skilled and semi-skilled national manpower in order to reduce, to great extent, the dependence on expatriates. The Sabah Al-Salem Industrial Institute, SSII, and Shuwaikh Industrial Institute, SII, was forged between 1992-1993, by the Kuwaiti Government with the aim to equipped local manpower with the know-how and know-why that are applied in local industries and business. The research is focus on measuring the perception of a sample of heads of supervisors at the Ministry of Electricity and Water and at the oil sector towards the quality of the graduates from the Sabah Al-Salem Industrial Institute, SSII, and Shuwaikh Industrial Institute, SII. The research is based on extensive field work that encompasses a review of the related literature, interviews with a sample of heads of supervisors at the Ministry of Electricity and Water and at the oil sector to assess the quality of SSII & SII, graduates. Finally, the research will argue that unless the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII, recognize and appreciate the value of building a strong linkage with local industries, its contribution in tackling the shortage of skilled and semi-skilled indigenous in essential sectors on the economy will be below the government expectations, thus continuing relaying on expatriates for years ahead.

Keywords. Technical and *Vocational, on-the-job training program, Industrial Institutes, Kuwait*

1. Introduction

Technical and vocational education is essential to life-long learning as has a significant role in providing students with the required knowledge, skills, and attitudes that are mostly needed by industries and business. Technical and vocational education viewed as a "dual

system". It allows the transfer of knowledge, skills, and attitudes through a proper interaction teaching and learning system to maintain a high quality of graduates. The "dual system" would permit a significant integration of apprentices into the workforce arena that reduces the level of youth unemployment and increase skills acquisition. (Gonon, 2017) It is an opportunity to open a gate to labour market and tackling unemployment, particularly among youth. The number of employment youth increased by 4.4 million to 17.5 million. (U.S. Bureau of Labor Statistics report, 2020). The word vocational education is used frequently to refer to "the acquisition of competencies in various occupations along with a more broad-based general education that is necessary for taking on a fast-changing world of work". (NEP. 2020) Technical and vocational education is not just a unique type of education but also a certified type of education that would enhance indigenous capabilities that would be able to manage, maintain, and probably adapt the imported technology to suit local environments. Technical and vocational education refer to "those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life". (UNESCO 2020) Vocational students required to integrate their experiences from the workplace with what they learn at classrooms and vice versa. (Baartman et al., 2018) Learning that takes place at classrooms at school and colleges can be a valuable knowledge base for vocational students as they enroll at the workplace. (Kilbrink et.al., 2014; Rintala & Nokelainen, 2019) It is different from formal education that is taught is schools, colleges and universities. Interaction between technical and vocational education is highly noted in related literature. (Interreg Europe, 2020, European Commission, 2017, Gerard and Min, 2019). Interaction between both parties (vocational education institutions and industries) in various activities such as: joint research, consulting, problem solving, curriculum development, industrial training programs, intellectual properties, and licensing. The fruitful of such collaboration would be reflected on the quality of technical and vocational graduates as well as the academic staff. In the other hand, from industrial perspective, industry would receive skilled and semi-skilled manpower, solve existing production problems, achieving profits, modifying products, reduce production cost, and contribute, to great extent, to overall country manpower plan.

Teachers' qualifications and commitments play a vital role in the success of technical and vocational education. (Fiftyana, 2018, Serafini, 2018) Teachers with high level of emotional intelligence will demonstrate a positive emotion in tackling existing teaching and learning problems more than those who have a negative emotion. A tradition education system that imposed a rigid teaching and learning techniques would be applicable for those who tend to joint technical and vocational educational system. The transfer of theoretical concepts into practical functions require a highly sophisticated skill. The success of technical and vocational education would, to great extent, relay on the competencies of teachers and trainers. (Jia et. al., 2014)

The continuing spread of Covid-19 in the world has created an unforgettable and significant consequences that affected the life of human being. It causes economic and social disruption that left millions of people without work. Covid-19 pandemic has placed a considerable pressure on the health infrastructure, labour markets and rate of employment to a degree never seen before. (UNESCO, 2020) In a survey conducted by UNESCO and World Bank on 126 countries revealed that 90% of respondents indicated total closure of TVET centers in their country and virtually 98% of respondents reported disruption of work-place learning. (UNESCO, The World Bank, 2021) The unexpected and sudden closures of technical and vocational education colleges and centers has introduced, without hesitation, the online teaching which without doubt cannot replace the quality of the present of students in classes, workshops,

and laboratories. The majority of technical and vocational colleges and centers were unable to transfer the required skills, whereas others find a way through apprenticeship with highly precaution rules and procedures. The conversion to online teaching showed a crucial deficiency in some countries due to the lack of electricity, access to internet connectivity, communication apparatus, and inadequate preparation and readiness of lecturers and trainers to convert to online platforms. According to an international survey, many countries and training providers were insufficiency prepared to cope to the pressure resulted from covid-19 pandemic. (International Labour Organization, 2021) The transfer to online teaching can been described as a process of learning by doing or learning by mistake. Online teaching has focus on increasing the number of students attending a certain meeting rather than the quality of teaching and the extent of achieving course objectives. This was worsening by the inability of lecturers and trainers to transfer the necessary skills that are required by industries and business. Technical and vocational education curriculum is design to encompasses the know-how and know-why that enable students to perform in a real work place. Online learning is perceived as an effective method to enhance the quality of teaching since increases student's interaction with lecturers and trainers, encourage students to attend classes, and ensuring learning satisfaction. (Belaya 2018, Bignoux 2018) Technical and vocational education require students to obtain the necessary knowledge, skills, and attitudes that in most need of industries and business. Therefrom, online learning requires a careful design of the content to tackle those obstacles converting students in achieving course objectives. (Indira, et.al., 2017, Muthuprasad, 2020). Lecturers and trainers must exert efforts to apply and explore all educational technologies to achieve satisfactory outcomes. (Ferreira, et. al., 2014) Technical and vocational education comprising of apprenticeships which permit students to spend a considerable time in work place. Employers' benefits from apprenticeships by receiving skilled-based education manpower for good-pay career. (U.S. Department of Labor) The combination of workplace training and education is viewed to be the reason behind the success of labour market of apprentices. (Guglielmo, 2020) There is recent evidence revealing that young apprentices earn higher income in their early years in labour market comparing to other vocational students qualified at the same level. (Cavaglia et. al., 2020) Technical and vocational specialist considered apprenticeships as a "boundary crossing approach" to the real world of work. It can help in forging connection between students practices in vocational schools and those at the training company. (Caruso, et., al., 2020, Sappa, et., al., 2018) Technical and vocational education is a dual system that connect theory to practice. A dual system type of education implies two learning locations, vocational education and training companies. (Gurtner, et., al., 2012) A mutual interest and necessity must exist between both parties, technical and vocational education and local industries and business, so that fruitful outcomes can be generated. In most developed countries the participation of stakeholders would contribute in strengthening the collaboration between vocational education and industries and companies. Vocational education would be interested in improving the standard of learning and teaching, while industries and companies would be focusing on diversifying and improving productivity. The role of teachers in technical and vocational education is clearly marked in related literature. Vocational education teachers obtained both pedagogical and industry and business knowledge to prepare young students and adults for the career market. (OECD, 2021). Lecturers and trainers must exert efforts to apply and explore all educational technologies to achieve satisfactory outcomes. (Ferreira, 2018) The role of teachers in technical and vocational education is highly discussed in related literature. (Sallimah, et., al., 2021, OECD, 2021, Muhammad, et., al., 2020) Teachers' beliefs may be influenced through professional development for technology integration in the TVET curriculum (Sallima, et., al., 2021), the

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success of learning would depend on quality of teacher's relationship with students (Gabriela, 2016), teachers must focus of career education, as a career is how teachers organized education to work after students leaving school (Education Service Austria, 2021), due to the changes in working life, innovations and variable skills requirements change rapidly the role of VET teachers and trainers. (NSVETT 2020)

Kuwait as one of the gulf states has realized the importance of technical and vocational education in reducing the dependence on expatriates, especially in essential sectors on the country's economy (e.g., oil, electricity and water, health care, constructions). It is the believe of the Kuwaiti government that technical and vocational education would accelerate the country's economic and social growth as well as preparing students to take over expatriate in the most crucial sector in the economy. The Kuwaiti government has forged the Public Authority for Applied Education and Training, PAAE&T, to respond to the urgent of essential sectors of the economy from semi and skilled indigenous manpower. The PAAE&T aims include interaction with major institutions in the labour market, training national manpower, joint research with local industries, and linking programs to society's needs and requirements. In another word, the Kuwaiti government attention is not only to prepare students to the world of work but also to closing the gap between technical and vocational institutions and local industries. The PAAE&T has five colleges and eight training centers. The Sabah Al-Salem Industrial Institute, SSII, was forged in 1992 and consists of the followings departments: Auto department, Construction Department, Metal Mechanics Department, Electrical Departments, Electronical Department, and General Material Department. The Sabah Al-Salem Industrial Institute aim to graduate trained national technical workers through specialized technical training and to provide trainees with the expertise that creates highly qualified technicians and technical assistants to work in the public and private sectors". The Shuwaikh Industrial Institute, SII, was forged in 1993, and consists of the followings departments: Welding Departments, Machining and Operation Systems Department, Production and Metal Formation Department, Electrical Engineering Department, Automotive Engineering Department, Carpentry and Decoration Department, General Materials Department, and Post-secondary Major Department. The Shuwaikh Industrial Institute aim to "Preparing national technical cadres in various industrial specializations to meet the needs of the current labor market". (The Public Authority for Applied Education and Training Website. 2021) The current population of Kuwait in 2021 is 4,328,550 a 1.36% increase from 2020. Expatriates account for about 70% of Kuwaiti population, among which 1.1 million Arab expatriates and 1.4 million Asian expatriates. (World Population Review, 2021) The focus of this research is to examine how successful is the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII, in reducing dependence on expatriates at the Ministry of Electricity and water and at the oil sector. It hopes that the results of this research would guide the management of the SAII & SII in setting and implementing an appropriate and an efficient plan that would contribute significantly in enhancing the quality of the, SSII & the SII, graduates. Thus, reducing the level of dependence on expatriates at the Ministry of Electricity and Water and at the oil sector.

3. Research Objectives:

a. To identify and examine the level of interaction between the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII, and the Ministry of Electricity and Water and the oil sector.

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b. To identify and examine the perception of the selected heads of supervisors at the Ministry of Electricity and Water and at the oil sector towards the quality of graduates from the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII.
c. To identify and examine those obstacles (if any) that might affect the quality of the graduates from the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII.
d. Discussions and Recommendations.

The outcomes of the research would indeed guide the management of the the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII, in improving the quality of their graduates. In addition, enhancing the standard of academic staff and enrich their knowledge, skills and attitudes towards strong collaboration with the Ministry of Electricity and Water and at the oil sector. Overall, examining whether the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII, have succeeded in proving the Ministry of Electricity and Water and the oil sector with skilled and semi-skilled indigenous manpower. Thus, reducing dependence on expatriates at the Ministry of Electricity and Water and the oil sector.

4. Materials and Methods

4.1 Design

This research consisted of a descriptive survey designed to identify and examine the type of interactions between the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII, and the Ministry of Electricity and Water and the oil sector. The research focused on whether students acquired the necessary knowledge, skills and attitudes that are suitable to the Ministry of Electricity and Water and the oil sector. In addition to, examining the perception of the Ministry of Electricity and Water and the oil sector towards the quality of the graduates from the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII. The research focused on the requirements as well as the obstacles that may hinder the enhancement of the quality of teaching and learning at the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII as well as the methods for strengthen the linkage with the Ministry of Electricity and Water and the oil sector

4.2 Sample

The research encompassed interviews with (8) heads of supervisors at the Ministry of Electricity and Water and (6) heads of supervisors at the oil sector. The selected heads of supervisors have more than 20 years of working experience and have a contact with the graduates from the SSII & SII, who are officially employed at the Ministry of Electricity and Water and at the oil sector six years ago until now. The research focused on examining the perceptions of selected heads of supervisors towards the quality of the graduates from the SSII & SII, who already working at the at the Ministry of Electricity and Water and at the oil sector. Among the issues that were discussed are: attitudes towards working at the Ministry of Electricity and Water and at the oil sector, the level of knowledge and skills, communication skills, the ability to deal properly with machines, devices, and tools, work ethics, work loyalty, understanding technical terms, and the ability to solve existing technical problems. Interviews were conducted with a sample of (7) graduates who are already working at the Ministry of Electricity and Water and (8) graduates who are already working at the oil sector. The aim is to investigate and measure their views towards the quality of teaching and learning while they were attending the SSII & SII.

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4.3 Instrumentation

The target population for this research consists of interviews with (8) heads of supervisors at the Ministry of Electricity and Water and (6) heads of supervisors at the oil sector. The selected heads of supervisors have more that 20 years of working experience and having either direct contact with the SSII & SII, graduates who are officially working at the Ministry of Electricity and Water and the oil sector six years ago until now. The aim is to obtain an in-depth information on the quality of the SSII & SII graduates and the level of work readiness. Interviews were conducted with a sample of (7) graduates who are already working at the Ministry of Electricity and Water and (8) graduates who are already working at the oil sector. The aim is to investigate and measure their views towards the standard of teaching and learning while they were attending the SSII & SII.

4.4 Statistics and Parameters

The statistics pertain to the sample. The parameters pertain to an entire population.

4.5 The research parameters/sample are as follows:

(a) Iinterviews were conducted with (8) heads of supervisors at the Ministry of Electricity and Water and (6) heads of supervisors at the oil sector.

(b) Interviews were conducted with a sample of (7) graduates who are already working at the Ministry of Electricity and Water and (8) graduates who are already working at the oil sector.

5. Research Findings:

5.1 The Characteristic of the Research Sample.

Interviews were conducted with (8) heads of supervisors at the Ministry of Electricity and Water and (6) heads of supervisors at the oil sector. The selected heads of supervisors have more that 20 years of working experience and having contact with the SSII & SII graduates who are officially working at the Ministry of Electricity and Water and the oil sector six years ago until now. The objective was to examine their perception towards several issues related to quality of the SSII & SII graduates (e.g., communication skills, work loyalty and work ethics).

5.2 Measuring the level of collaboration between the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII, and the Ministry of Electricity and Water and the oil sector.

It is well understandable that the linkage between both parties would indeed strengthening the quality of the SSII & SII graduates. In addition to, improving the quality of the SSII & SII safety and health protocol, reviewing and developing curriculum, enhancing the standard laboratories and workshops, updating students' evaluation scheme, and implementing effective joint committees. No doubt that, technical and vocational education provides industries with skilled and semi-skilled manpower at the same time reducing the rate of unemployment specially among young generation. The rapid advancement of science and technology, particularly in production techniques and methods force technical and vocational education institutions to apply new learning and teaching techniques to respond to industrial needs and business requirements. On other hand, industries and business have to strengthen their relationship with technical and vocational education institutions in order to close the gap and thus enhance students and graduates' competencies in various field of production methods and techniques. The dynamics of relationship between technical and vocational education institutions and industries and business is highly stressed in related literature. (OECD, 2018, Australian Government Productivity Commission, 2021, Triki, 2008, Yorke and Knight, 2019)

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The contribution of a strong linkage between technical and vocational education and local industries and business is manifest itself in reducing rate of unemployment, particularly in youth unemployment (Simone 2020), enhancing students' knowledge and skills (The World Bank, 2017), and strengthening teachers' competencies and personality (OECD, 2021, Gabriela, 2016), reviewing and monitoring curriculum to respond to industrial needs (Bohmann, 2007), forming proper policy and strategy for future manpower needs analysis (Khawla 2011, Ministry of Education and Sports, 2019), enhancing and upgrading the learning process to be compatible with industrial requirements (OECD, 2021), and maintaining a strong partnership for ensuring a continuing future successful collaboration (Florinda, 2021). An attempt has been exerted to interview selected heads of supervisors at both the Ministry of Electricity and Water and at the oil sector. The types of collaborations between both parties are revealed below.

Identifying the types of collaboration between the SSII & SII and the Ministry of Electricity and Water and the oil sector.

Joint Efforts in:	Available	Not-Available
Creating Data Base		✓
Setting Plan/Action Plan		✓
Curriculum Review & Development		✓
Updating Workshops & Laboratories		✓
Setting Student's Evaluation Scheme		✓
Setting Criteria for Assessing Graduates		✓
Consultancy Committee		✓

Note: The above percentages are an approximate estimation obtained from the selected heads of supervisors at the Ministry of Electricity and Water and at the oil sector.

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Joint Efforts in:	Available	Not-Available
Conducting Joint Research		✓
Joint Seminars		✓
Health & Safety Protocol		✓
Needs Analysis		✓
Determining level of: Knowledge		✓
Level of Skills		✓
Level of Attitudes		✓
Joint Meetings		✓

Note: The above percentages are an approximate estimation obtained from the selected heads of supervisors at the Ministry of Electricity and Water and at the oil sector.

Joint Efforts in:	Available	Not-Available
Assessing Quality of Training Program		✓
Setting Criteria for Students Enrollment		✓
Sharing Technological Information		✓
Invinting of Experts		✓
Participation in Inventions Exhibitions		✓
Exchange of Staff		✓
Visiting the Recipients of Graduates	✓	

Note: The above percentages are an approximate estimation obtained from the selected heads of supervisors at the Ministry of Electricity and Water and at the oil sector.

Selected heads of supervisors at the Ministry of Electricity and Water and at the oil sector have been interviewed and questioned on the types of linkage with the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII. The research findings

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showed no tangible evidences of an effective collaborations with the recipients of the SSII & SII, graduates in various academic activities. Among the absent of significant aspects of collaboration were as follows:

a) The lack of data bank.

An effort has been made to identify whether the selected heads of supervisors have been approached by staff from the SSII & SII for forging a data based. It is a crucial to established a data bank that would include names and contact numbers of those staff at the SSII & SII who are responsible for teaching and training students to be ready to work at the Ministry of Electricity and Water and at the oil sector In addition to, gathering and storing relevant information and data regarding the number of students who are expected to be graduates from the SSII & SII in the near future and the number of SSII & SII graduates who are already working at the Ministry of Electricity and Water and at the oil sector. It is highly advisable that the SSII & SII have an access to the names and contact numbers of those who are supervising the SSII & SII graduates at the Ministry of Electricity and Water and at the oil sector to allow a free access to information and data regarding the quality of the SSII & SII graduates. Regrettably, the findings of this research revealed that no data base or data bank have been allocated nor in the process of completion between both parties.

b) The lack of a plan and/or action plan.

An attempt has been made to investigate whether the selected heads of supervisors have a mutual plan set with the SSII & SII to ensure high quality of graduates. Indeed, it is considered highly significant to set a professional plan that embedded objectives that are focusing on how to improve the standard of students at the SSII & SII as well as on how to enhance graduates' competencies at the Ministry of Electricity and Water and at the oil sector. A plan that consists of objectives that are realistic and measurable to allow both parties (the Ministry of Electricity and Water and the oil sector), to jointly review, monitor, and evaluate the standard of the SSII & SII graduates. Unfortunately, the findings of this research revealed that no indication of a professional joint plan and/or action plan that encompasses essential and realist objectives or aims that are related to reducing dependence on expatriates, especially at the recipients of the SSII & SII graduates, nor a plan that focuses on monitoring and assessing the quality of the SSII & SII graduates.

c) The lack of joint efforts in curriculum development.

It is well understandable that curriculum design, review, and monitoring in technical and vocational education is different from its counterpart in formal education (e.g., schools, colleges, universities). Technical and vocational education is described as a dual system type of education that comprises theory and practical work at employer workplace. There is no doubt that the contents of technical and vocational curriculum focus on determining the level of knowledge, skills, and attitude that are mostly needed by industries and business. Therefore, the contribution of industrial and business in reviewing, updating, and monitoring curriculum in technical and vocational education is one of most priority of those who are running technical and vocational institution. In another word, industrial and business have to be involved in assessing the quality of curriculum, particularly those skills and attitude which are in current practice at industrial and business work place. The success of technical and vocational education graduates would depend, to great extent, on the degree of industrial and business involvement in setting practical and measurable criteria's in judging the quality of vocational graduates' competencies. The findings of this research indicated without doubt, that there are no efforts

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have been noted by both parties (the Ministry of Electricity and Water and the oil sector and the SSII & SII) to review, monitor, update, and evaluate the curriculum at the SSII & SII.

d) The lack of joint efforts in update the SSII & SII laboratories and Workshops.

Indeed, science and technology are in a rapid change and efforts to cope and deal with the advancement of technological machines, devices, monitors, and tool is extremely difficult. When heads of supervisors at the Ministry of Electricity and Water and at the oil sector questioned whether the SSII & SII staff have contacted them for an advice for assessing and updating the types of machines, devices, monitors, and tools, the reply was negative "no". It is essential that students at the SSII & SII to practice on recent machines, devices, monitors, and tools that are compatible with the technical facilities at the Ministry of Electricity and Water and at the oil sector. Indeed, this would encourage students to practice what they have been learned at the SSII & SII place into a real working environment. In addition to, strengthen the quality of the SSII & SII graduates since they would totally familiar with the use of the same machines, devices, monitors, and tools that are available at the Ministry of Electricity and Water and at the oil sector.

e) The lack of joint efforts in setting student's evaluation scheme.

The Ministry of Electricity and Water and the oil sector must play a vital role with the SSII & SII in setting student's evaluation scheme that would contribute significantly in ensuring that students receive the right and relevant level of knowledge, skills, and positive attitudes that are in need by the recipients of the SSII & SII graduates. A joint effort to establish student's assessment performance scheme must be one of most importance priorities of the SSII & SII. The participation of the Ministry of Electricity and Water and the oil sector in forming those criteria related to the enhancement of the quality of the SSII & SII students would indeed ease the way to a high standard of graduates. The joint efforts in monitoring and adjusting student's performance criteria to respond to the advancement of technical machines and tools and production techniques and methods would reduce and/or overcome any obstacles that may occur when the SSII & SII graduates formally employed at the Ministry of Electricity and Water and the oil sector. When heads of supervisors questioned to indicate if there is a joint effort with the SSII & SII to forge student's evaluation scheme, the answer was negative "no".

f) The lack of joint efforts in assessing the quality of SSII & SII graduates.

It is highly recommendable that both parties participate in evaluating the standard of the SSII & SII graduates through joint committee. It is through such committee the heads of supervisors at the Ministry and Electricity and Water and at the oil sector can provide a sincere and truly feedback on the competencies of the SSII & SII graduates while they are officially employed at the recipients of the SSII & SII graduates. In addition to, providing a useful information on the quality and accuracy of the level of knowledge, skills, and attitude that are acquired by the SSII & SII graduates. A more useful information and data can be also provided by the Ministry and Electricity and Water and at the oil sector on the performance and attitudes of the SSII & SII students while there are on field training program. Despite the importance of such committee, no evidence has been allocated in respect to the existence of a joint committee between both parties (the Ministry and Electricity and Water and at the oil sector and the SSII & SII) to evaluate the quality of the SSII & SII graduates who are already employed at the recipients of the SSII & SII graduates. The absent of a joint committee would, indeed, hinder the improvements of the quality of the SSII & SII graduates.

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g) The lack of joint efforts in conducting joint research.

Research and development are highly importance in solving various issues concerning the quality of the SSII & SII graduates. A constant evaluation and monitoring of the competencies of the SSII & SII graduates through research and development would prevent and overcome any escalation or deficiencies that might occur during their present at the Ministry and Electricity and Water and at the oil sector. The joint research and development between both parties would allow a free flow of significant information and data and permit a fruitful exchange of experiences. However, the findings of this research revealed a clear absent of a joint research and development activities that would have, if well organised and implemented, a significant positive impact on the quality of teaching, learning, and training of the SSII & SII graduates.

h) Joint efforts in conducting joint seminars.

A free exchange of information's and successful experiences between both parties would, without doubt, enhance the quality of students attending the SSII & SII and its graduates. An active joint seminar between both parties is viewed as one of most academic activities that would help in improving the quality of the SSII & SII graduates and in maintaining a strong relationship. Other aspects of strengthen collaboration can be also investigated to ensure free exchange of information and set a realistic recommendation for upgrading the standard of the SSII & SII graduates.

i) The lack of joint efforts in enhancing safety and health procedures and rules.

The constant use of machines and tools would expose students and graduates to a certain hazard if safety and health procedures and rules not properly applied and monitored. Therefore, students and graduates who attend the Ministry and Electricity and Water and at the oil sector must be aware of the risk involved when working in a hazardous area. It is highly recommended that the SSII & SII cooperate positively with the Ministry and Electricity and Water and at the oil sector to forge a safety and health procedures and rule. This would strength the relationship between both parties and protect the life of students and those who are already working at the Ministry and Electricity and Water and at the oil sector.

j) The lack of joint efforts in determining needs analysis.

The SSII & SII must be aware of the proximate number of those who should join the Ministry of Electricity and Water and at the oil sector in the near future. It is the responsibility of both the SSII & SII and the Ministry of Electricity and Water and the oil sector to forecast the need of graduates in different fields of speciality. The objective of determining need analysis is to help both parties in identifying the number of skilled and semi-skilled national manpower required by the Ministry of Electricity and Water and at the oil sector in the coming years. Unfortunately, no sign of a collaboration between both parties in a joint effort to perform a proper manpower needs analysis nor in determining the number of graduate's that are required by the Ministry of Electricity and Water and at the oil sector in the forthcoming years.

k) The lack of joint efforts in determining the level of knowledge, skills, and attitudes.

The Ministry of Electricity and Water and at the oil sector are not interested in graduates who have extensive knowledge that are not relevant to their work techniques and methods. In addition to, avoiding those graduates who are not properly skilled to deal with the type of production machines and tools applied in their work activities. The recipients of the SSII & SII

graduates reject those graduates who show negative attitudes towards working outdoor or dealing with machines and tools. Thus, both parties must consider an effective collaboration to determine the level of knowledge they are required for those graduates before their employment. In fact, technical and vocational education is a dual system type of education that concentrate on specific knowledge that students and graduates must acquire before enrolling at the Ministry of Electricity and Water and at the oil sector. It is the responsibility of the SSII & SII to open the gate for fruitful interaction with the Ministry of Electricity and Water and at the oil sector to agree on the current and future skills that graduates must obtained and able to practical in a real working environment. Attention must be also paid to students and graduates' attitudes since the recipients of the SSII & SII graduates require sincere and honest skilled and semi-skilled indigenous manpower who are truly eager to work at the Ministry of Electricity and Water and at the oil sector premises.

l) The lack of joint efforts in conducting joint meetings.

The management of the SSII & SII must considered forging a joint committee with the Ministry of Electricity and Water and at the oil sector. It is an opportunity for both parties to meet and discuss relevant matters concerning their interest and aspiration in meeting the country overall manpower plan. A joint committee would allow a free transformation of information and data and secure a continuing of a strong relationship between both parties so that objectives can be accomplished.

m) The lack of joint efforts in forging a consultancy committee.

A joint consultancy committee between both parties would not only strengthen relationship but also open a new window for a better and a successful contribution in achieving short, medium, and long-range objectives that are embedded in the overall country's manpower plan

n) The lack of joint committee in evaluating training program.

The existing of a joint committee that focus on assessing the quality of training program is highly recommended. It would provide both parties with the actual information on student's real interaction with trainers and the ability to transfer what have been learned at the SSII & SII into a similar work environment. Lecturers and trainers can absorb student while they are present on training program and speculate whether students are sincerely interested in working at the Ministry of Electricity and Water and at the oil sector. It is also an opportunity for students to familiarise with the type of machines, devices, monitors, tool, and working environment that they would expect to work in the near future.

o) The lack of committee for setting criteria for SSII & SII students' enrolment.

It is preferable that the SSII & SII consider inviting a member from each of the recipient of its graduates in the selecting and interviewing committee for those who wishes to enrol at the SSII & SII. Their involvement would contribute is evaluating candidates' personality and attitude since the recipient of the SSII & SII graduates already have an extensive experience of the SSII & SII graduates' personality and their real motive behind their willingness to employ at the Ministry and Electricity and Water and at the oil sector.

p) The lack of exchange of technological Information.

Exchange of a free technological information between both parties would light a shade on new scientific and technological machines, devices, monitors, and tools fall into the interest

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of both parties. The creation of an information channels between both parties would close the gap and allow for the movement of new information, new learning and teaching techniques, exchange of lecturers and trainers, and establishing contact with external counterpart education and training institutions. It is worth mentioning at this point that, there is no concrete evidence of staff visiting from the SSII & SII to the recipients of the SSII & SII graduates to exchange information regarding a professional assessment of all aspects related to the quality of training program.

5.3 Examining the perception of the Ministry of Electricity and Water and the oil sector regarding the quality of graduates from the Sabah Al-Salem Industrial Institute, SSII, and the Shuwaikh Industrial Institute, SII.

An attempt has been made to evaluate the quality of the SSII & SII graduates who are already working at the Ministry of Electricity and Water and the oil sector five years ago until now. Interviews have been conducted with selected heads of supervisors at the recipient of the SSII & SII graduates and the results are showed below.

Quality of SSII & SII Graduates

Elements	%	Comments
Lack of English Language Skills	95%	Skills
Lack of Technical Terms	75%	Lack of Skills
Inability to Understand Electrical Circuits	65%	Lack of Knowledge & Skills
Inability to Understand Electrical Boards	70%	Lack of Skills & Knowledge
Inability to Understand Elec. Compotents	55%	Lack of Skills & Knowledge
Unfamiliar with Machines & Devices	70%	Lack of Skills & Knowledge
Lack of LED & Solar Energy Knowledge	85%	Lack of Knowledge & Skills

Note: The above percentages are an approximate estimation obtained from the selected heads of supervisors at the Ministry of Electricity and Water and at the oil sector.

It is essential that graduates are able to communicate in English language since the types of machines and devices have an operation and maintenance instructions written in English language. In addition to, the ability to communicate properly with foreign employees and supervisors in work place. However, the research findings revealed that approximately 95% of the total selected graduates are below the acceptable standard in communicating in English language. This was worsening by the lack of technical terms (approximately 75% of the total) and the unfamiliarity with electrical circuit (65%) of the total selected graduates. When

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questioned to evaluate the ability of graduates in interpreting electrical circuit networks, approximately 65% of the total were unable to describe in details the electrical circuit networks.

Digital Circuit Boards is considered as an alternative to the circuit theory approach, stress on energy flow rather than just signal interconnection to explain logic circuit behavior. (Ralph, 2012) There are different type of digital circuit boards and approximately 70% of the total graduates are unaware of the types, importance, and function of Digital Circuit Boards. It was also noted that selected graduates lack significant skilled related to their field of specialty, such inability to identify electrical components (approximately 55% of the total), and unfamiliar with the electrical machines and devices availability of the recipients of the SSII & SII graduates. It was revealed that (approximately 85% of the total) were unfamiliar with the meaning of light-emitting diode (LED) and its efficiency (cost, lighting distribution range, types, degree of weather resistance and components), and unaware of solar energy (definition which is the transfer of sun and then converted into thermal or electrical energy, domestic, commercial, and industrial sites usages, cost, and limitation).

Quality SSII & SII Graduates

Elements	%	Comments
Inability to write Short Technical Report	85%	Lack of Skills
Inability to use Recent Technical Software	100%	Lack of Skills & Knowledge
Neglecting Safety & Health Procedures	75%	Lack of Attitudes & Skills
Inability to Solve Technical Problem	85%	Lack of Skills
Inability to Understand Technical Drawings	80%	Lack of Skills
Constant use of Mobile Phones	90%	Lack of Attitudes

Note: The above percentages are an approximate estimation obtained from the selected heads of supervisors at the Ministry of Electricity and Water and at the oil sector.

It is part of graduate's skills to able to write and understand technical reports, however approximately 85% of graduates seem unable to write proper technical report. The use of computer software related to graduate's specialty is significant in enhancing their knowledge and skills and connect them with the world of new technology, since no strong evidence support their ability of graduates to apply new software to assess and enhance their competencies at work place. The issue of safety and health procedures and rules are essential since graduates would work in a hazardous working environment and the probability of accidences occurrence is very high and could be an expected. The SSII & SII must ensure students are well aware of safety and health procedures and rules and must practice applying a high standard of safety and health precautions, since only approximately 75% of graduates showed a proper safety and

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health practice. It was also visible that graduates have not practice (approximately 85%) on solving possible technical problem that might occur while working with machine, devices, and tools related to their field of specialty nor understanding (approximately 80%) different technical drawings that are applied at the Ministry of Electricity and Water and at the oil sector. The selected supervisors have also noted graduates' unacceptable attitudes since (approximately 90%) continuing using mobile phone at work.

Quality of SSII & SII Graduates

Elements	%	Comments
Inability to Understand Power Stations Sect	80%	Lack of Knowledge & Skills
Unfamiliar with Types of Welding Machines	75%	Lack of Knowledge & Skills
Unfamiliar with Welding Safety Rules	70%	Lack of Knowledge & Skills
Unfamiliar with Welding Techniques	75%	Lack of Skills & Attitudes
Inability to Conduct a Proper Welding Job	80%	Lack of Skills
Unable to Detect Welding Faults	80%	Lack of Skills & Knowledge

Note: The above percentages are an approximate estimation obtained from the selected heads of supervisors at the Ministry of Electricity and Water and at the oil sector.

It is inevitable that graduates from the SSII & SII would work in power stations and the need to enhance their knowledge and skills in the various aspects on the operations and possible hazardous involved must be considered as one of the SSII & SII priorities. However, approximately 80% of the total selected graduates are not familiar with the electrical power station sections. When asked to identify the types of welding machines approximately 75% of the total) seems unaware of the types of welding machines and approximately 70% of the total have minimal idea about welding safety rules. There are several types of welding techniques (e.g., gas metal welding, tungsten Arc welding, shielded metal Arc welding), however when asked to identify welding techniques approximately 75% of the total were lacking knowledge about the types of welding techniques. When measuring the perception towards the quality of welding performed by the selected graduates, only (approximately 20% of the total of graduates) who are able to conduct a proper, safety, and clean welding job. The main welding jobs are performed by the contractor employees. When questioned whether graduates able to detect welding faults (e.g., porosity, undercut, cracks) or it can be classified as external welding defects and internal welding defects, approximately 80% of the total graduates were lacking a clear knowledge and skills is such significant skills. Therefore, graduates must understand at least the main sections of electrical power station that are exist at the Ministry of Electricity and Water as well as understanding the main sections of the distribution of oil production and

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refinery layout at the oil sector since approximately 80% of graduates are not aware of the main section involved at the work place sites. In addition to, enhancing graduates' ability to thoroughly understand electrical circuit networks that is already applied and monitored by the Ministry of Electricity and Water. The absent of such information and skills (approximately 65%) from the graduates who are already working at the Ministry of Electricity and Water and the oil sector would require a re-training and re-assessment that would consume efforts, time, and cost.

Quality of SSII & SII Graduates

Elements	%	Comments
Lack of Maintenance Procedures	70%	Lack of Skills
Unfamiliar with Types of Maintenance	75%	Lack of Knowledge
Unfamiliar with Maintenance Purpose	60%	Lack Computer Skills
Unfamiliar with Maintenance Hazards	80%	Lack of Skills & Attitude
Unfamiliar with Codes of Safe Practices	90%	Lack of Knowledge & Skills
Inability to Cope with Work Stress	60%	Lack of Skills & Attitudes

Note: The above percentages are an approximate estimation obtained from the selected heads of supervisors at the Ministry of Electricity and Water and at the oil sector.

It is well understandable that maintenance is essential to ensure high quality long-term machines performance. When machines performed in a proper manner, job can be accomplished on time or ahead of time. However, when major problem occurred, jobs would be delayed, cost would be increases, and reputation of industries in meeting customers' requirements would be decline. Despite the importance of maintenance procedures which identify preconditions, precautions, and clear instruction, selected graduates (approximately 70% of the total) are not familiar with maintenance procedures. At attempt was also made to find out if graduates are aware of the types of maintenance, and approximately 75% of the total graduates cannot recall the different types of machines maintenance. It is well agreed that the crucial purpose of maintenance in industrial and business perspective is to ensure the continuation of production and cost reduction. In other word, to ensure a proper and efficient operation level in a long-term perspective. However, when graduates asked about the purpose of maintenance, approximately 60% of the total seem unaware of the objectives of machine maintenance. The misconduct of maintenance rules and procedures would indeed cause risk to life and machines. It is a highly risk job and the probability of accidence occurrence is high especially when handle with unexperienced worker. In fact, there are certain rules that workers have to follow and obey to prevent accidence that would cause loss to lives and properties. However, when graduated

questioned to clarify in details the maintenance hazardous, approximately 80% of the total have not provide acceptable answers. Safety and health organizations have forged safety code of practice to be used and applied in industries and business which provide details information regarding specific tasks by using safety and health codes to ensure workers complying with work Health and Safety regulation (WHS). As expected, approximately, 90% of the total graduates have not concrete information's or ideas regarding the safety and health codes of practice. In respect to coping with work stress, approximately 60% of the selected graduates showed negative attitudes towards coping with stress at work. The need to enrich student's knowledge, skills, and attitudes in the various techniques in coping with stress while working with machines and tools is highly recommended so that graduates can met work standard while working at the Ministry of Electricity and Water and the oil sector.

An effort has been exerted to measure the perception of a sample of graduates who are already working at the Ministry and Electricity and Water and at the oil sector regarding the quality of teaching and learning while they were attending the SSII & SII. The selected graduates confirmed that the standard of the SSII & SII workshops and laboratories are not, to great extent, compatible with its counterparts at other external institutions nor with the workshops and laboratories at the Ministry and Electricity and Water and at the oil sector. The selected graduates stress on the need to concentrate on specific details topics related to their field of specialty rather than discussing general topics. The selected heads of supervisors at the Ministry and Electricity and Water and at the oil confirmed that graduates from the SSII & SII lack significant knowledge and skills regarding essential issues related to their specialty, such as: inability to clarify type of electrical shocks and its consequences, types of insulated electrical networks and the degree of danger involve, electrical networks safety rates, how to calculate length of street lights, proper position for fixing street lights, defining position of street light on two ways road, different types of street light (public street, motorways, domestic street, reaction center), methods of fixing street light on different facilities, regulation regarding level of lighting power set by the Ministry of Electricity and Water, types of electrical networks, electrical power station lines, devices used to identify defect underground cables, factors affecting the performance of electrical power stations, the use of electrical devices for underground cable/pip locator system, types of electric volts, meaning of light-emitting diode (LED) and its efficiency (cost, lighting distribution range , types, degree of weather resistance and components), solar energy (definition which is the transfer of sun and then converted into thermal or electrical energy, domestic, commercial, and industrial sites usages, cost, and limitation), understanding and interpreting electrical drawing at a refinery sites, types of energy sources at the oil sector, average power requirements for air compressor, chemicals pumps, downhole pump (10hp), electric actuator, solar package, understanding and interpreting drawings for the electric power field and electrical one line diagram.

6. Summary, Discussion, and Conclusions.

Electricity is considered a significant aspect in our society that serve the need of people, hospitals, industries, business, schools, college, university, and the whole society. Nowadays, people are using electricity for different purposed such as: heating's, cooling's, refrigerators, computers, networks, internet connections, transportations, constructions, operating machines and devices, and lighting domestics houses, street, and various public and private facilities. The total electricity consumption in the United States of America was about 3.8trillion kWh in 2020 and 13 times greater that electricity used in 1950. (Independent Statistics & Analysis, 2021)

Electricity and water are importance for sustaining and enhancing economic growth and social development. (Julia, et., al., 2020) The demand for the consumption of energy and water

is increasing due to the fast growing of population, changing of consumer consumption habit, the high rate of commercial and industrial usage. In fact, the majority of water in the electricity sector is consumed for generating electricity (about 88%), especially for cooling processes at thermal power station plants, with thermal power station plants accounting for about 70% of the today's international installed power station plant capacity. (OECD, 2016) According to U.S. Energy Information Administration (2021), USA is considered the second major country in the production of electricity and generates around 4327 terawatts per hour of energy. The outbreak and spread of Covid-19 pandemic in the world have creating a critical and challenging situation for decision makers to ensure the continuing supply of electricity and water, particular to the health sector. "The most important challenge for electricity companies in the region has been to ensure the continuity of services despite the effects of the pandemic. This isn't an industry in which people can work from home; you have to operate 24/7 to ensure electricity reaches homes reliably," says Ariel Yépez, chief of the Energy Division at the Inter-American Development Bank (IDB, 2021). In respect to Kuwait, the country has one-tenth of the world's proven oil reserves and has a considerable natural gas reserve. Kuwait is heavily dependent on oil export and accounts about 90% of export revenue. Due to the rapid grow of population, the Kuwaiti government-built desalination plants at Kuwait City and several other locations. As mentioned earlier, Kuwait remains heavily dependent on foreign labour, despite the efforts to reduce dependence rate of expatriates.

It is well acknowledged that, technical and vocational education is considered as a dual type of education system that allow the transfer of theory into real work place. It is an education that would ease the transfer of students from schools and colleges after graduates into an assigned job in industries and business premises. The success of technical and vocational education would depend, to great extent, on the ability of the management of technical and vocational education to apply an appropriate and effective criterion in the selection of students who wishes to joint technical and vocational institutions. In Kuwait as in many gulf states (e.g., United Arab Emirates, Bahrain, Oman), The shortage of skilled and semi-skilled is highly noted in essential sector of the economy. Expatriate form approximately 88.5% of the United Arab Emirates population, 70% in Kuwait, and 53% in Bahrain. The Kuwaiti government, as in other gulf states, has realized the importance of enhancing indigenous capabilities, particularly in essential sectors of the country's economy (e.g., oil, electricity and water). As a result, the Kuwaiti Government has established the Public Authority for Applied Education and Training, PAAE&T, which has five colleges and eight training centers. The Sabah Al-Salem Industrial Institute, SSII, was forged in 1992 and consists of the followings departments: Auto department, Construction Department, Metal Mechanics Department, Electrical Departments, Electronical Department, and General Material Department. The Sabah Al-Salem Industrial Institute aim to graduate trained national technical workers through specialized technical training and to provide trainees with the expertise that creates highly qualified technicians and technical assistants to work in the public and private sectors". The Shuwaikh Industrial Institute, SII, was forged in 1993, and consists of the followings departments: Welding Departments, Machining and Operation Systems Department, Production and Metal Formation Department, Electrical Engineering Department, Automotive Engineering Department, Carpentry and Decoration Department, General Materials Department, and Post-secondary Major Department. The Shuwaikh Industrial Institute aim to "Preparing national technical cadres in various industrial specializations to meet the needs of the current labour markett". (The Public Authority for Applied Education and Training Website. 2021)

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The findings of this research suggest that there is no concrete evidence have been allocated for a strong collaboration between the SSII & SII and the Ministry of Electricity and Water and with the oil sector in various importance aspect of academic and practical activities. In respect to evaluating the quality of graduates who are already employed six years ago until now, at the Ministry of Electricity and Water and at the oil sector. Interviews were conducted with selected heads of supervisors. The selected heads of supervisors have more than 20 years of working experience and have a direct contact with either the SSII & SII graduates. The findings of this research revealed that quality of the SSII & SII graduates is below the accepted standard. The link between the Ministry of Electricity and Water and the oil sector and the SSII & SII is absent in various essential aspect such as: joint efforts in creating a joint data bank, setting a plan/action plan, joint efforts in curriculum development, joint efforts in update the SSII & SII laboratories and workshops, joint efforts in setting student's evaluation scheme, joint efforts in assessing the quality of SSII & SII graduates, joint efforts in conducting joint research and development, joint efforts in enhancing safety and health procedures and rules, joint efforts in determining needs analysis, joint efforts in determining the level of knowledge, skills, and attitudes, joint efforts in conducting joint meetings, joint efforts in forging a consultancy committee, joint committee in evaluating field training program, joint efforts in forming a committee for setting criteria for SSII & SII students' enrolment, and joint efforts in exchange of technological Information.

An effort has been exerted to assess the standard of the SSII & SII graduates who are already working at the Ministry of Electricity and Water and at the oil sector six years ago until now.

It is essential that graduates are able to communicate in English language since the types of machines and devices have an operation and maintenance instructions written in English language. In addition to, the ability to communicate properly with foreign employees and supervisors in work place. However, the research findings revealed that approximately 95% of the total selected graduates are below the acceptable standard in communicating in English language. This was worsening by the lack of technical terms (approximately 75% of the total) and the unfamiliarity with electrical circuit (65%) of the total selected graduates. When questioned to evaluate the ability of graduates in interpreting electrical circuit networks, approximately 65% of the total were unable to describe in details the electrical circuit networks.

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The overall research findings confirmed, without any doubt that, the absent of concert evidence of a significant and effective participation with the recipients of SSII & SII graduates (the Ministry of Electricity and Water and at the oil sector). The aim of the country is to reduce dependence on expatriates. However, this objective seems be out of reach, for the time being, since the SSII & SII is not seriously considering forging a strong and a fruitful collaboration with the Ministry of Electricity and Water and at the oil sector in various essential academic and practical activities. The clear lack of graduate's knowledge, skills, and attitudes is highly notable in this research. The management of the SSII & SII must exert efforts to enhance the quality of its graduates and set a strict rules and requirements before accepting those who are willing to service at the Ministry of Electricity and Water and at the oil sector. Unless the Sabah Al-Salem Industrial Institute, SSII, and Shuwaikh Industrial Institute, SII, thoroughly realized the importance of forging a link with the Ministry of Electricity and Water and at the oil sector, Kuwait would continue, without doubt, relaying on expatriates for years ahead**.**

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