

"Comparison of the Absence of the Trainees in Quarter and Semester Systems"

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Abstract

This case study compares the quarter system and the semester system in terms of trainees' attendance and absence. As well as emphasizing the preference of the semester system over the quarter system in terms of the low percentage of trainees' absence. The percentage of absence was calculated in each section separately, whether in the semester system or the quarter system over four years and in a total (1343 sections). Where the sample of the absence percentage in the quarter system represented by (699) values, while it was represented by (644) values in the semester system. Then, calculation of the absence rate for each course, the comparison made on six courses, to find out how the absence rates change with the affect of the system. The researchers identified many possible methods such as Box Plot to visualize data in addition to the descriptive statistics to understand the available data statistically. Then we have used the F-Test Two-Sample for Variances to determine which type of hypothesis test can be applied. Finally, t-Test Two-Sample Assuming Unequal Variances was chosen to test the hypothesis of the study, which is "do the number of absence (DN) are greater in the quarter system compare with the semester system". Test at $\alpha=0.05$. This paper presents enough evidence to conclude that the number of DN is greater in the quarter system compare with the semester system. It was found that the average trainees' absence in the semester system has decreased as a result of the shift to the semester system to reach (9%), compared to the average trainees' absence of a quarter system, which amounted to (13.9%). Therefore, and by testing the hypothesis that the semester system reduces the trainees' absence better than the quarter system, which has been statistically confirmed and through charts also.

Keywords: Attendance, Quarter System, Semester System, Technical Institute

1. Introduction

The technical institutes are working to provide a high level of specialized training in multiple technical fields such as electricity, mechanics, information technology, manufacturing, and other specialties. Their mission is to prepare national cadres that are practically qualified and with highly professional skills to carry out the operation and maintenance work in the various factories and companies. A related, increasingly important, and rapidly developing area of expansion in higher education is technical and vocational training. Indeed, the 100,000 students receiving vocational education in 2014 are projected to reach 450,000 by 2020 (Lawrence 2016). The trainees are admitted to these technical institutes after obtaining the general secondary certificate or its equivalent as a basic condition for the admission to these institutes. These institutes are characterized by the great provided support by governments generally, as these institutes greatly assist in increasing Many .employment rates and reducing unemployment because of their closeness to the requirements of the labor market developed countries face many difficulties in providing the necessary financial resources, due to the large financial investments required by higher education, and the problem appears more clearly in developing countries that have followed the policy of full funding for education, including higher education in the Kingdom of Saudi Arabia, where the state has supported With generous education at all levels (Oqayli 2019).

The training system in technical institutes consists of Competence-Based Training (CBT). In competence-based Vocational Education and Training, learning is related to work practice. Knowledge, skills, and attitudes that are important for a certain job-competence profile, are learned in an integrative way and are commonly assessed (Baumeler 2019). CBT distinguished by training on specific skills with detailed tasks in the form of small work carried out by the trainee to obtain the required skill. Also, to attain qualifications, trainees must demonstrate competency in performing general and job-specific tasks that are prescribed in national training packages (McVicar and Polidano 2018). During the training periods, there are different evaluation systems that measure what has been obtained from the skill. The trainee is graduated in the acquisition after skill. Usually, the training period in technical institutes takes two to three years. The trainee qualifies to work as a certified technician in a specific field. This type of training has proven its efficiency according to the recommendations of the companies and institutions. This system is characterized by the ability to contain the semester systems or the quarter systems to complete training in these skills. Semester systems are more common than quarter systems at U.S. higher education institutions (Smith 2012).

Many private companies operating in the petrochemical and other industrial fields work in Jubail Industrial City. Jubail produces about 7 percent of the world's petrochemicals (Communications International 2013). These companies and plants attract qualified national professional cadres, which require the technical institutes to link their training courses and curricula with the available jobs in these companies and their changing needs. The implemented academic system (the semester system or the quarter system) affects the quality of the outputs of these technical institutes. The decision to convert from a quarter- to a semester-based system may rest primarily on issues related to institutional finances, student transfer protocols, and/or curriculum changes, the decision can have significant implications for student-motivated behaviors (Johnson and Kestler 2014).

Training in these institutes varies between the semester and the quarter system. The period of study in technical institutes varies by two and a half system and the quarter system. In the semester system, the academic year is divided into two main semesters. Each semester consists of fifteen weeks and does not include the final exams week. The trainees are trained for six hours daily for five days a week. While in the quarter system, the academic year is divided into four basic training quarters. The duration of the training quarter is eight weeks each week, five training days, and every day six training hours, and each training quarter separates by one week. Colleges have long debated the utility and effectiveness of different academic systems. While many systems exist, the early-start semester and the modern quarter system are the most common (Gibbens and Williams 2015).

One of the most important objectives of the technical institutes is to operate based on the provision of resources and the legalization of their spending. As it requires the provision of large sums of money for training on the latest equipment, which is constantly and rapidly developing according to the needs of the industrial sector. Certainly, the institutes aim to obtain the return from investing this money spent on devices and equipment, by training and graduating the largest number of qualified trainees to meet the requirements of the labor market. The quality of the education provided by technical institutes of any country determines its global position. Innovative practices are needed to improve the quality of education (Patil et al. 2019). Providing qualified trainers also requires providing sufficient budgets to cover these expenses. Both industries and technical institutions are the main two identified sources to solve the key issues of youth. Industries provide employment opportunities to the technically qualified youth towards economic development while technical institutions

produce killed youth s needed for the industries (Nallusamy and Rao 2018). The biggest problem lies in increasing the efficiency of operation by improving training methods, especially in reducing the absence of trainees. Even if the institutes are forced to change training systems to improve the work environment and increase operating efficiency, as was shown in the topic of this research.

2. Background

2.1. The importance of attendance and the affect of absence

The absence of trainees in technical institutes has a major impact on the quality of outputs, in terms of poor training because the trainee does not attend to acquire specific skills. Also, the frequent absence indicates the lack of discipline of the trainee, as this is evident in the poor performance of the trainee, in his academic results, and in depriving him of certificates of academic excellence, even if he excels in his grades. On the other hand, the frequent absence of trainees affects their denial of admission to tests, and consequently, they obtain a grade of denial (DN) in the course, accordingly, the trainee must re-study the course and delay his planned study. In the case of the trainee delay increases to more than three semesters in the academic year, this causes the trainee to be dismissed academically. Because of the academic dismissal of students, the percentage of trainees' attrition increases, and consequently, the efficiency of operation in institute decreases and the number of the expected graduates decreases according to the established plans. Trainees with larger quantities of absences face greater risks of a range of adverse educational outcomes. These include lower achievement, poorer grade retention, and increased likelihood of early institute attrition (Hancock, Gottfried, and Zubrick 2018).

2.2. Methods of calculating absence

The instances of the trainees' absence from attending training courses are recorded at the Jubail Technical Institute throughout the faculty member who records attendance at the beginning of each theoretical or practical training session. The trainee is registered late if he is five minutes or less late. If the delay is repeated three times, an absence of one session is calculated. The trainee shall be absent from the training session if he is more than five minutes late or has not attended. In the semester system, the trainee gets a DN grade if his absence in the course exceeds (31) hours for English language courses. While the trainee gets a denial grade (DN) if his absence exceeds more than two weeks in other courses. In the quarter system, the trainee who exceeds (15%) of the training period for any course is forbidden from that course and gets a denial grade (DN). The trainee who gets denial grade (DN) in any training course, must repeat the course in the subsequent training quarter. The absent trainee must attend the reinforcement periods specified for him, to acquire specific skills, knowing that absence in the reinforcement periods is counted as part of the absence for that course. Authorized absences may nonetheless be excessive, where the reason underlying the absence is excusable but the duration may still be associated with significant educational consequences without intervention or support. Unauthorized absences, where the reason is either not acceptable or simply not provided to the institute, reflect a much broader array of factors and behaviors (Hancock, Gottfried, and Zubrick 2018).

The trainee's grade of denial in the course may affect his average final score. Whereas, every time he gets DN, the recorded credit hours in the semester or quarter are decreased. Consequently, his academic rates would be weak compared to his peers who obtained degrees in the same course. Absenteeism behavior may negatively affect the general educational process and personal academic achievement of students. The teaching and learning environment will be affected as it may

form an unwelcoming and dull learning environment for both teachers and students (Qutub, Bafail, and Alomari 2018). Also, the grade of denial may be recorded in the trainee transcript certificate upon graduation. Which may affect when competing with his peers during the employment.

On the other hand, the process of trainees obtaining denial grades is not open for the trainee to obtain repeated denial grades. Rather, it is determined by the total period of the trainee's stay in the institute, which he must not exceed. Poor training strategies by instructors, an unfavorable training environment, too much socialization, part-time jobs and poor relations with the lecturers are also reasons for absence (Cheruvalath 2017). As we mentioned earlier, the increase in the DN increases the attrition rates of trainees from the institute. Consequently, the efficiency of operation decreases, which requires hard work to address this problem.

2.3. The importance of reducing the rates of obtaining DN

One of the most important technical training problems is the problem of trainees' attrition. This is generally measured by the number of trainees admitted at the beginning of the program and the number of remaining and graduating from the same program in a specific period. Attrition rates, including the percentage of DN, are usually measured at the end of the year or the end of the program or courses. Absence also called hidden dropout or irregular institute attendance is considered as the first stage of institute dropout (Lannegrand-Willems, Cosnefroy, and Lecigne 2012). If the percentage of the attrition and the percentage of DN is low, the efficiency of the program or courses and the quality would be high, and vice versa. To address this problem, some institutes try to implement a policy of compulsory attendance or give some percentage of marks for attending classes. Institutions have different policies regarding attendance and this varies from country to country. One solution offered to the problem of absence has the policy of attendance that students must attend at least a certain percentage, such as 85% of contact hours for a particular course (Cheruvalath 2017). Usually, indicators of the attrition rate are followed up from the funded entities, to ensure efficient operation and increase the return on investing their money, whether governmental or private entities. On the other hand, the problem of the trainees obtaining the DN puts pressure on the trainees themselves, due to their lack of training that qualifies them to succeed in the course and obtain a training certificate and then obtain a job or continue in higher education. Since the relationship between absence and course performance has been investigated in several studies. In such, studies conducted in several Universities in South Africa, Saudi Arabia, as well in the United States revealed that the student's absence and academic performance have a negative correlation. Thus, it implies that the probability of students to obtain a high grade is through maintaining good attendance (Qutub, Bafail, and Alomari 2018).

3. Jubail Technical Institute

Jubail Technical Institute considers as one of the most important training institutes in the Kingdom of Saudi Arabia. It is supported by the Royal Commission for Jubail and Yanbu through the education sector. Jubail Technical Institute seeks to achieve its mission in training the national workforce in technical fields to meet the needs of the industrial sector. JTI qualifies skilled technicians who are effectively trained to deal with modern industrial technology. The Institute has highly qualified staff and faculty members to achieve its vision. JTI aspires to be the standard of excellence in the field of technical training and small and medium enterprises in all Arab Gulf countries. The institute obtained institutional accreditation from the National Center for Technical and Vocational Accreditation and Assessment under the Education & Training Evaluation Commission. As one of the first training institutes to obtain this accreditation in the Kingdom. The

institute offers training on a range of different skills such as industrial electric skills, instrumentation and control, industrial electronics, process operation skill, industrial millwright, industrial welding, machining skills, CADD skills, crane operation skills, computer network, and PC support skills and underwater maintenance training program. The training in the institute extends to two and a half years. The first year for the basic skills that include studying the English Language. After completing the year of basic skills, the trainee moves to one of the abovementioned to train in for one year. The trainee then qualified to apply what he trained in public and private companies and institutions. In the academic year, the institute accepts an average of (1,200 trainees). A wide range of services is provided, such as housing, subsistence, health services, etc. Several years ago, the training system in the institute was changed from the quarter system to the semester system, to improve the training environment and operating conditions. The institute has several electronic systems such as the Student Information System (SIS), through that attendance and absence are recorded, and all student academic data such as grades can be recorded.

JTI has experimented with the quarter system and semester system. The institute concluded many results based on practical experience. From that, the length of training time such as semester system is more appropriate for the trainee in terms of attainment and confirmation of information, and the opportunity for discussion between the trainee and the instructor, unlike the quarter system. Also, the holding of grouped final exams into the semester system allows good follow-up, unlike the quarter system. Regardless of the training system, scheduling is usually preferred over the parallel horizontal format in most courses, with few exceptions. Depending on the available resources, the semester system provides the opportunity to offer the full courses of the degree plan. Trainees are less likely to be late from their peers, due to waiting for a specific course, as in quarter system as in Table 1. With the difference between the two systems, there is a big difference related to tackling the issue of the training schedule. When the institute moved from the quarter system to the semester system, the study materials were scheduled in horizontal, parallel ways. Besides, the number of hours of courses has been studied, training programs have been developed, the content has been revised, and modern curricula have been designed to suit the semester system as in table2.

Table 1: Degree Plan of the Quarter System

Quarter 1		Quarter 2		Quarter 3		Quarter 4	
Course Code	Contact Hours	Course Code	Contact Hours	Course Code	Contact Hours	Course Code	Contact Hours
1. BSEL103	160	1. BSEL204	160	1. BSEL305	160	1.BSEL406	160
2. BSPE101	32	2. BSHS201	32	2. BSCD304	48	2.BSTM401	48
3. BSTD103	48	3. BSIC201	32	3. BSCA303	64	3.BSWP401	64
Total	240	4. BSKB201	32	Total	272	Total	272
		Total	256				

Table 2: Degree Plan of the Semester System

Semester 1		Semester 2	
Course Code	Contact Hours	Course Code	Contact Hours
1. SEL 1407	003	1. SEL 2408	003
2. STD 1404	54	2. SCA 2404	06
3. SHS 1402	03	3. STD 2405	54
4. SIC 1402	03	4. SWP 2402	06
5. SPE 1402	03	5. STM 2402	54
Total	435	Total	510

The institute has many local and international accreditations and approved test centers for all skills that fall under the basic skills, electrical and electronic skills, mechanical skills, chemical skills, computer skills. It provides many different training services such as special training programs designed for companies, short training courses, and technicians' evaluation services and other services. To raise the quality of training, many motivation programs provided for outstanding trainees and trainees who were not absent from the courses.

4. Research Objectives

This study aims to compare the quarter system and the semester system in terms of trainees' attendance and absence. As well as emphasizing the preference of the semester system over the quarter system in terms of the low percentage of trainees' absence. The study also provides the semester

system as one of the solutions to the problem of increasing the percentage of trainees' absence that .resulting during the implementation of the quarter system

5. Research Methodology

5.1. Collecting absence data in the quarter and semester systems

In the quarter system, the trainees' absence data from the course denial numbers (DN) were collected after the end of each quarter. This started from the second half of 2011 to the first half of 2013. The overall sample was for (8) quarters. Absence was taken in every section (a group of trainees studies together during the quarter or semester) of a large number of sections, represented in (61, 69, 84, 84, 89, 100, 107, and 105). Knowing the total number of trainees in each section, the number of absences in each section was converted to the percentage of absence. Absence ratios were taken based on the courses for the same period from the second half of 2011 to the first half of 2013. The samples were for six courses. The percentage of the trainees' absence was monitored to compare it with the semester system. The transition period data between the quarter system and semester system was excluded due to the instability of data and its overlap between the two systems.

Moving to the semester system, the trainees' absence data from the courses DN was collected after the end of each semester. This started from the second half of 2014 to the first half of 2016. The overall sample was for (4) semesters. Absence was taken in every section for a large number of sections represented in (130, 156, 170, and 188). Knowing the total number of trainees in each section, the number of absences in each section was converted to the percentage of absence. Absence ratios were taken based on the courses, and for the same period from the second half of 2014 to the first half of the year 2016. The samples were for several six courses in which the absence rates of the trainees were followed up to compare them with the quarter system.

5.2. Calculation methods

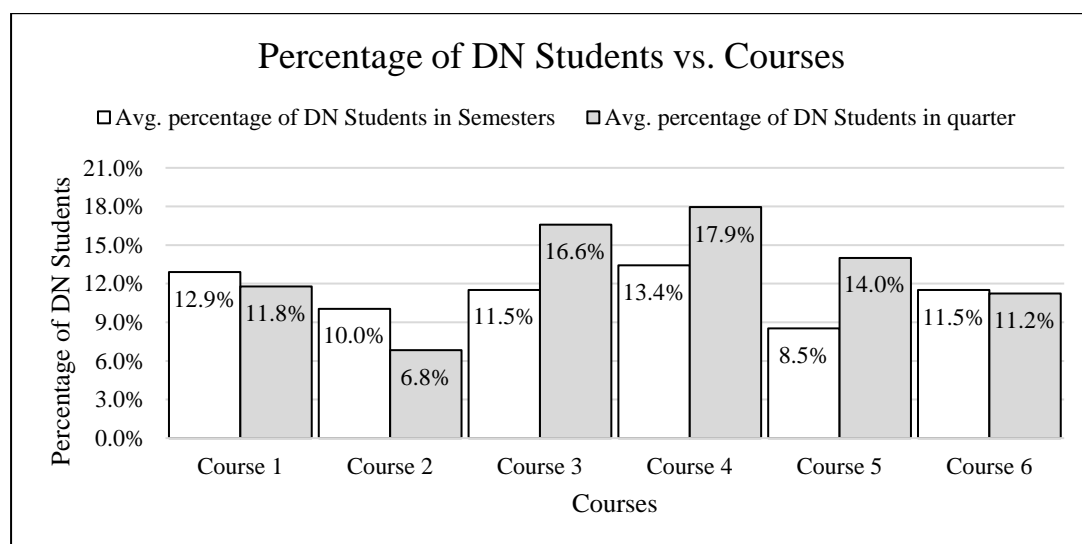
The percentage of absence was calculated in each section separately, whether in the semester system or the quarter system over four years and in a total (1343 sections). Then, the transition was made to the courses to calculate the absence rate for each course in the semester system or the quarter system and compare the six courses, to find out how the absence rates change with the effect of the system. Also, the average absence rate was calculated for each semester separately and compared them with the previous semesters and quarters, to see how the absence rates changed up or down over time with the transition from the quarter system to the semester system. After making the initial comparisons, the statistical tools were used by collecting all the data on the absence rates in the sections separately in the semester system and quarter system, to test the hypothesis of the study and confirm the research objectives. Box Plot has been drawn to visualize data in addition to Descriptive Statistics to understand statistically the available nature of data for both the quarter system and the semester system and their comparison. Then we have used the F-Test Two-Sample for Variances to determine whether Variances are equal or not, to determine which type of hypothesis test can be applied. The use of t-Test: Two-Sample Assuming Unequal Variances was chosen to test the hypothesis of the study, and the results were as it will come later. The study questions and the null and alternative hypotheses are: Do the number of absence (DN) are greater in the quarter system compare with the semester system. Test at $\alpha=0.05$.

6. Results

6.1. The absence rate for courses

The absence of trainees was calculated in a sample of six courses, and then the average absence was taken for both the quarter system and the semester system. Emphasis was placed on these six courses, as they did not change much after the transition from the quarter system to the semester system, but was merged to be taught or trained in the semester. These courses vary, as courses no. 1 and 2 represent the English language courses, while courses No. 3, 4, 5 and 6 represent occupational safety, technical drawing, computer applications, and mathematics, respectively. As it appears in figure 1, it is noted that the average absence of trainees in the occupational safety courses, technical drawing, and computer in the quarter system is much higher than the semester system by a large difference. In contrast to the English and mathematics courses, the average absence is slightly higher in the semester system. The average trainees' absence rates for the courses were calculated to give us a preliminary indication of comparison between the quarter and semester systems. Accordingly, we have moved to the second method, which is calculating the average absence of trainees in the quarter and semester systems

Figure 1: Percentage of DN Students vs. Courses

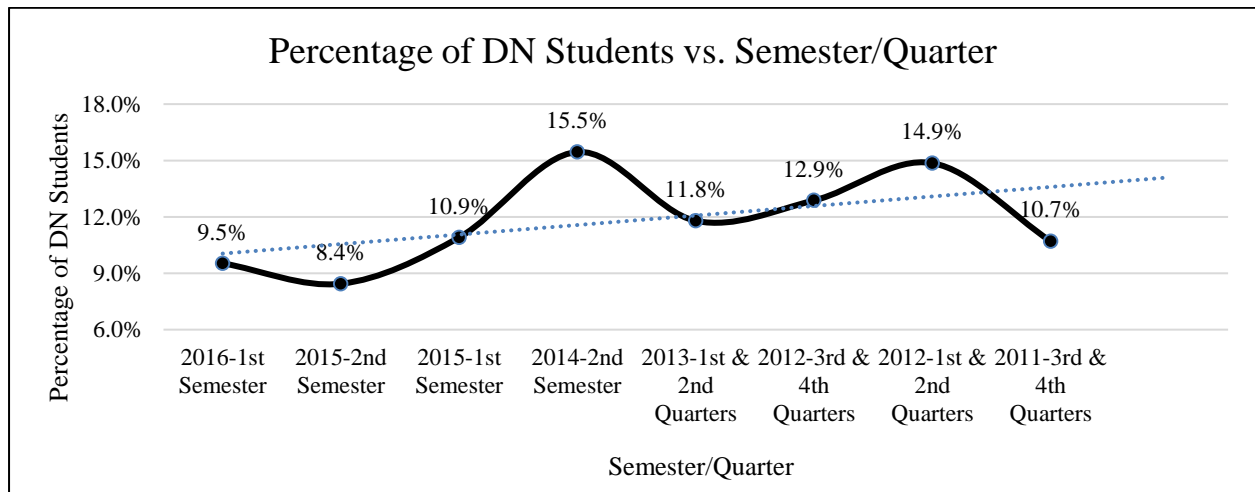


6.2. The percentage of absence in quarter and semester

In this method, the average absence of trainees was calculated in each semester or quarter. Whereas, two quarters equal one semester, as shown in figure 2. The calculation was carried out for four semesters and eight quarters combined into four groups. Absence was calculated also on graduated periods from 2011 to 2016. Through the figure 2, when comparing absence in a quarter system with the semester system, it is clear that absence decreases as we go towards the semester system and progress with the years. Noting some abnormal values, such as the average absence in the second half of 2014

or the first half of 2012. This method was used to obtain another indicator to compare quarters and semesters in terms of absence. The data of the absence averages are detailed further as in figure 3.

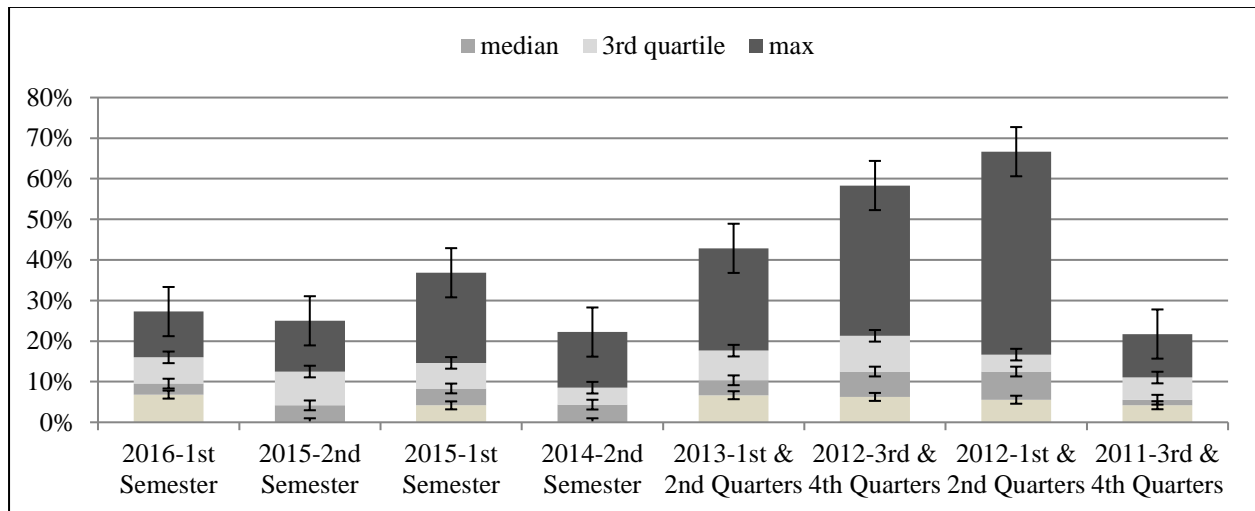
Figure 2: Percentage of DN Students vs. Semester/Quarter



6.3. The statistical properties of absence ratios

In figure 3, the important statistical properties of absence ratios are summarized in all available data whether for quarter or semester systems to understand and compare them with each other. A box plot tool was used, the box plot is a graph that summarizes the most important statistical characteristics of a frequency distribution for easy understanding and comparison. Information about where the data falls and how far it spreads can be seen on the plot. The box plot divides absence data for each quarter or semester into four groups. The median groups, which separate the upper half of the absence from the lower half, after arranging the data in ascending order. The upper half and the lower half are divided again by the median to form the four groups. It is evident from the graph that a large group of absence ratios falls in the max higher group in the case of the quarter system compared to the semester system. Also, the high ratio of absence in the sections was in the first and second half of the year 2012 and the first half of the year 2013. It is also noted that the rates of absence in some sections reached (65%) in the quarter system. On the other hand, the third quartile in the semester system is less than the third quartile in the quarter system. Accordingly, we have used the known statistical methods for the final judgment on the preference of absence ratios in the semester system over the quarter system.

Figure 3: Box Plot of the Statistical Properties of Absence Ratios



6.4. Descriptive statistics of the absence ratios

Statistically, it was started to know the available samples of the absence ratios in the quarter system and the semester system. Descriptive statistics were used to know that and the results were as shown in table 3. Where the absence percentage in the quarter system represented by (699) values, while the absence of the trainees in the semester system represented by (644) values. The average absence ratios in the quarter system were (13%), while the average absence ratios in the semester system were (11%). It is noted that the average percentage of the absence of trainees in the semester system is less than the average absence ratios in the quarter system.

Table 3: Descriptive statistics of the absence ratios

<i>Semester System</i>		<i>Quarter System</i>	
Mean	11%	Mean	13%
Standard Error	0.00	Standard Error	0.00
Median	9%	Median	10%
Mode	0%	Mode	0%
Standard Deviation	0.09	Standard Deviation	0.11
Sample Variance	0.01	Sample Variance	0.01
Kurtosis	3.37	Kurtosis	3.50
Skewness	1.31	Skewness	1.60
Range	0.67	Range	0.69
Minimum	0%	Minimum	0%
Maximum	67%	Maximum	69%
Sum	69.96	Sum	92.42
Count	644	Count	699

Referring to the question and hypothesis of this study, “Do the number of DN greater in the quarter system compare with semester system” Test at $\alpha=0.05$.

The null hypothesis would be = $H_0: \mu_Q - \mu_S \leq 0$

The alternative hypothesis would be = $H_1: \mu_Q - \mu_S > 1$

We have used the F-Test two-sample for variances to decide whether to conduct t-Test for two-sample assuming equal variances or t-Test for two-sample assuming unequal variances. Moreover, from the table4, the one-tail p -value is usually multiplied by two to obtain the two tail p -value and it is small enough to tell us there is significant difference in population variances. That aside, we also see here that the variances are different. So we can conduct t-Test: two-sample assuming unequal variances.

Table 4: F-Test Two-Sample for Variances

	<i>Quarter System</i>	<i>Semester System</i>
Mean	0.132222181	0.108641225
Variance	0.013108911	0.007581638
Observations	699	644
df	698	643
F	1.729034252	
$P(F \leq f)$ one-tail	1.1879×10^{-12}	
F Critical one-tail	1.135911047	

Table 5: t-Test: Two-Sample Assuming Unequal Variances

	<i>Quarter System</i>	<i>Semester System</i>
Mean	0.132222181	0.108641225
Variance	0.013108911	0.007581638
Observations	699	644
Hypothesized Mean Difference	0	
df	1295	
t Stat	4.2679827	
$P(T \leq t)$ one-tail	1.05808×10^{-05}	
t Critical one-tail	1.64603113	
$P(T \leq t)$ two-tail	2.11617×10^{-05}	
t Critical two-tail	1.961797538	

From the results in the table 5, we can see the one-tail critical value. It's a right-tail test, so we can reject the null hypothesis if the t statistic is greater than the positive 1.646. The test statistic is $t = 4.267$. We can now decide on whether or not to reject the null hypothesis. Since the test statistic is, $t = 4.267$ is greater than 1.646. So we do reject the null hypothesis. In addition to that, we can see that the one-tailed p -value here is smaller than 0.05, telling us again to reject the null hypothesis. As a result, we can support the alternative. That is, there is enough evidence to conclude that the number of DN is greater in the quarter system compare with the semester system. And that concludes the test.

7. Conclusion and Recommendations

From the previous study, it is clear that the percentage of the trainees' absence in the courses varies between course and course on the two systems, the quarter system, and the semester system. Where the rates of the absence of the trainees in the courses of occupational safety, technical drawing, and computer applications were higher than those in the semester system, as in figure 1. This can be attributed to the low of contact hours for these courses by an average of six hours per course per week compared to the English language courses in which the contact hours were twenty hours. Note that the average contact hours for the trainee on a single day are six contact hours and thirty contact hours per week in both the quarter and semester systems. Some study discovered that there was a positive correlation between attendance and grade performance in a specific course; however, the researcher could not conclude that having attendance policies influenced either course performance or class actual attendance. In a correlation study of attendance and course grades of students, it concluded that increased absences cause lower grades but that low grades influence more frequent absences, suggesting an interaction effect between attendance and grades (Keyser 2019).

It can be said that the average trend of trainees' absence in quarter and semester systems has decreased as a result of the shift to the semester system to reach (9%) in the last two semesters to 2016, compared to the average trainees' absence in the year 2012, which amounted to (13.9%) as in figure 2. Several institutions have undergone a conversion from quarters to semester systems. Several of these institutions were examined for their impact on enrollment and student retention (Matzelle 1995).

It is also noted from figure 3, that the higher absence rates in courses have decreased significantly in the semester system, where the highest absence rate in the courses at the beginning of the year 2015 was about (35%), compared to the highest absence rate in some courses which reached (65%). This is a strong indication of the percentage decrease of trainees' absence in the semester system, according to the large sample of absence rate, which recorded at 644 samples. In the US, a small number of institutions run on the quarter system. As more US states seek to standardize their institutions' academic calendars that number may well get even smaller (Nguyen 2019).

Therefore, and by testing the hypothesis that the semester system reduces the trainees' absence better than the quarter system, which has been statistically confirmed and through charts also. The institute has a set of initiatives to reduce the percentage of the trainees' absence further than that, for example:

- Educating the trainees about the absence systems and the consequences, to increase the trainees' knowledge of the laws and regulations, reduce the absence rates and reduce the number of complaints resulting from the absence of the trainees.
- Developing a mechanism to accept trainees' excuses, to reduce the absence of trainees without a clear excuse and motivate the trainees to use the permissible limit of absence when necessary.
- Study and develop the number, of course, contact hours, when moving from a quarter system to a semester system and the need for long hours in which the course can be studied and understood more. Taking into account the rates of trainees' absence.
- Developing scheduling systems during the week and linking them to the nature of the courses, for example, courses with the greatest mental effort are distributed in the pre-afternoon periods. Unlike other practical courses, to increase the readiness of the trainee to learn for longer periods and not to boredom during the long training periods due to the schedule.

- Developing curricula and curriculum contents, where the need to merge courses, altering some courses and changing the order of the courses concerning the transition to the semester system, taking into account that the trainees' absence in the courses which should not significantly be affected.
 - Developing a student information system to record absence data, as this helps to record the trainees' absence data and increase accuracy and credibility and the possibility of recording absences even on mobile, and avoid the need for traditional paper systems.
 - Developing a competency-based training system by providing sufficient time in the semester system compared to the quarter system, which required additional times to train slow learner, where the trainee can catch up with his colleagues even when he is absent and therefore frustration does not leak to him and he can complete the course in one way or another to save time.
 - Providing housing services, developing its laws, since the close distance between trainees' residence and the classroom, and workshops decrease the probability of trainees' absence and thus decrease the rates of trainees' absence.
 - Improving the training environment in general and using new methods to reduce the absence of trainees, such as deduction of grades from evaluation for each absence day in the cooperative training program and other methods.
- Finally, throughout the experience of the Jubail Technical Institute, the previous study, and others, the semester system is considered as the best academic system in terms of reducing the absence of trainees and improving a large set of training performance indicators that will be addressed in future studies.

8. Acknowledgements

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الملخص

تقارن دراسة الحالة هذه حضور المتدربين وغيابهم في النظام الربيعي ونظام الفصل الدراسي للتدريب في المعاهد التقنية. وتؤكد على تفصيل نظام الفصول الدراسية على النظام الربيعي في التدريب من حيث انخفاض النسبة المئوية لغياب المتدربين. تم حساب النسبة المئوية لغياب المتدربين في كل شعبة على حدة ، سواء في نظام الفصل الدراسي أو النظام الربيعي على مدار أربع سنوات بما مجموعه (1343 شعبة). حيث كانت عينة نسبة الغياب في النظام الربيعي ممثلة بـ (699) شعبة ، بينما مثلت (644) شعبة نظام الفصول الدراسية. كما تم حساب معدل الغياب لكل مقرر ، وتمت المقارنة على ست مقررات ، لمعرفة كيفية تغير معدلات الغياب مع تأثير النظام. ولذلك حدد الباحثون العديد من الطرق الممكنة مثل مخطط البيانات لتصوير شكل البيانات بالإضافة إلى الإحصاءات الوصفية لفهم البيانات المتاحة إحصائياً. ثم استخدموا اختبار (ف) لعينتين من المتغيرات لتحديد نوع اختبار الفرضيات الذي يمكن تطبيقه. أخيراً ، تم اختيار اختبار (تي) على عينتين بافتراض وجود تباينات غير متكافئة لاختبار فرضية الدراسة ، وهي "هل يكون عدد الغياب أكبر في نظام الفصل الدراسي مقارنةً بنظام الفصل الدراسي" ، وتم أخذ القيمة الاحتمالية عند مستوى الدلالة (0.05). و تقدم هذه الورقة أدلة كافية لاستنتاج أن عدد غياب المتدربين أكبر في النظام الربيعي مقارنة مع نظام الفصول الدراسية. وقد وُجد أن متوسط غياب المتدربين في نظام الفصل الدراسي قد انخفض نتيجة للتحويل إلى نظام الفصل الدراسي ليصل إلى (9 %) ، مقارنة بمتوسط غياب المتدربين في النظام الربيعي ، والذي بلغ (13.9 %). لذلك ، ومن خلال اختبار الفرضية أعلاه بأن نظام الفصل الدراسي يقلل من غياب المتدربين أفضل من نظام الربيعي ، فقد تأكد ذلك إحصائياً ومن خلال المخططات أيضاً.

الكلمات المفتاحية: حضور المتدربين ، النظام الربيعي ، نظام الفصل الدراسي ، المعهد التقني