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Effectiveness of Training of Software (Excel) for Bachelor Level (Bsc) Students in Birendra Multiple Campuses, Bharatpur

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ABSTRACT

This study aims to evaluate the knowledge levels on statistical software excel for the BSc 1st and 2nd year students in Birendra, Campus, Braratpur, Chitwan. Moreover the study also aims to examine the effectiveness of statistical software excel training for them. Out of 201 BSc physical group students in 1st and 2nd year, 52 students are taken as sample excluding nonresponses. To examine the knowledge about statistical software excel, 30 multiple choice questions had been asked to them before conducting training. 7 hours training for each (52) students had been conducted on statistical software excel. 15 days later from the end of training, the post-test has been done to them.

The post-test average knowledge Score is (20.73±5.27) and pre-test score was (9.35±6.35). The finding of the difference of knowledge score has been satisfied the normality by exploratory data analysis with normal curve and Shapiro-Wilk normality test. The average score after training (total 52 students) is much greater than that of before training and the standard deviation after training is slightly lower. The t-test is statistically significant and the training is effective for BSc level students in Birendra Multiple campus, Bharatpur.

Introduction

Due to changes in technology and the competitive environment, it is challenging for students to keep up with trends and best practices in their future careers. Learning and professional development turns them into strong and more fitting skills by allowing them to produce fruitful and personalized knowledge and skills for the students today. Professional well-planned curricular activities in the teaching-learning activities grow students' achievement. Knowledge alone is not enough in their entire careers to support them. Students are studying to achieve only academic certification according to the university curriculum. Hence training and workshops (except the given curriculum of the university) remain essential in assessing the needs of bachelor-level students.

Training effectiveness refers to the quality of the training provided by the institutions and measuring whether training met its goals and objectives. It attempts to obtain information about the training program and to assess the value of pieces of training in light of that information for improving further training. The cause of evaluating training and workshop programs is to decide whether the training programs are achieving their specific training objectives.

Review of Literature

Dhungana, Piryani, Chapagain, & Neupane (2015) have explained the training is one of the important aspects of faculty development at Chitwan Medical College (CMC) and the study was conducted to assess the effectiveness of the faculties' training pretest, posttest experimental group design. They found only 5.6% of the participants had adequate knowledge in pretest whereas after training, 27.7 % had adequate knowledge. The mean (±SD) knowledge score before and after the intervention was 26.7 ± 5.6 and 33.6 ± 5.6 respectively. Hence the software training was statistically significant and then effective.

Hassan, Vishna, & Nadarajah (2021) have found out that Workshops are the most common models to enhance knowledge and skills in a specific subject area with the intent to explore, solve a problem and invent new things. The most main aspect of a workshop is the transfer of knowledge in a safe learning environment as a faculty development activity (FDA). They concluded that a significant difference of the mean pretest and post-test score within the group was also significant between the groups. A post-test score, controlling on pretest score, was found not significant and is suggestive of an effectively delivered workshop for all participants.

Sajjad (2010) conducted a study in the Faculty of Arts, University of Karachi to determine the effectiveness of various teaching methods used for teaching students at the graduate level and found the lecture method as the best teaching method. Reasons included; teacher provides all knowledge related to the topic, time-saving, students attentively listen to lecture and take notes, etc. The group discussion was rated as the second best method of teaching because of; more participation of students, the learning is more effective, the students don't have to rely on rote learning, and this method develops creativity among students, etc. Students' perception and ratings about the interesting and effective teaching methods is a way to suggest improvements in the teaching-learning process.

Chaves, Wangenheim, Furtado, Oliveira, Santos, & Favero (2015) had conducted a study and found that Software process modeling (SPM) is an important area of software engineering because it provides a basis for managing, automating, and supporting software process improvement (SPI). Teaching SPM is a challenging task, mainly because it lays great emphasis on theory and offers few practical exercises. Furthermore, as yet few teaching approaches have aimed at teaching SPM by introducing innovative features, such as games. The use of games has mainly been focused on other areas of software engineering, for example software project management. The paper describes a formal experiment carried out to assess the learning effectiveness of a serious game (Desig MPS), designed to support the teaching of SPM, and to compare game-based learning with a project-based learning method. The results indicate that playing the game can have a positive learning effect and results in a greater degree of learning effectiveness than does the project-based learning instructional method.

Sweta, Vimal, Sharma, Kushwaha, & Kumar (2018) conducted a study and found the average score before and after the administration of a structured teaching program. They found a significant difference in scores. According to the findings, the average knowledge score before the intervention was 11.5, which increased to 17.5 after the intervention. The paired t-test was statistically significant with a very high level of p-value.

Statement of Problems

Hlushak and others (2020) explained in their article that mathematics in the system of higher education has enlarged the status of the general education subject and should become an integral part of the professional training of future bachelors, including economists, on the basis of inter-subject connection with special subjects. Such aspects as the importance of improving the scientific and methodological support of mathematical training of students by means digital technologies are revealed.

They realized that it is necessary to introduce digital technologies in two directions: for the organization of educational space and in the process of solving applied problems at the junction of the branches of economics and mathematics branches.

Cole (2016) studied in his dissertation that experimental and comparison groups were used to manage a spatial skills software-based intervention. The standardized test, the Revised Purdue Spatial Visualization Test for Rotations (PSVTR) was used to measure students' spatial skills. The Results of his study showed higher gains for students who used the statistically significant intervention software.

Ntakana (2011) investigated the effectiveness of support programs offered by universities with special reference to Walter Sisulu University. In the literature study and through the empirical research it was established that, for an effective and successful holistic student development, different student support programs are necessary. Academic, social, emotional, physical, and financial support needs to be effectively addressed to meet students' needs. Student development practitioners require being adequately equipped for the efficient and effective provision of student support programs.

Today's technology changes at an exponential rate. Software training comes in convenient to get a jump on new technologies and become skillful and familiar of new knowledge with them. Students will gain to do research activities; they learn real-world situations from both the trainers as well as the other students. It is necessary for problem-based learning of students and then increases the market-based knowledge of students. Institutions as well faculties use their resources and develop themselves as per the change in real world. Most of the studies on evaluating training effectiveness have been conducted on faculties of colleges and employees of any organization. But no studies have been conducted yet in this context for students. Hence this research is essential in the present context for students.

This article answers the following research questions.

1. Is there adequate knowledge of software for bachelor-level students?
2. How much the level of the knowledge and skills on software for students?
3. What is the effectiveness of training and workshop?
4. Is the software training of students meeting the goals of the program?

Objectives of Study

The objective of this article is to examine the knowledge levels on statistical software excel for Bachelor-level (B Sc 1st year and 2nd year) students of Birendra Multiple Campus, Bharatpur. It also analyses the effectiveness of training on software for them.

Data and Methodology

This article intends to examine the effectiveness of software training on students' achievement as well as the improvement of knowledge of students on software through training on software. Hence, a descriptive and cross-sectional survey design is used.

Out of 201 no of enrollments, 52 students are taken as samples for this study purpose. So 201 no of students are the population and 52 no of students are the sample for this study. Table 3.1 shows the respondents' profiles.

Table No 1 : Respondents Profile

B. Sc.	Enrollment or population of physical group	Participants in Training or sample
1st year	83	23
2nd year	118	29
Total	**201**	**52**

The semi-structured and self-administrative questionnaire has been used before and after training. To test the knowledge score of excel, total 30 numbers of objective-type questions have been given to the 52 no of students of BSc 1st and 2nd year before training. The training has been conducted for each participating student for 7 hours duration. Then these same questions were asked them after conducting training. The post-test questionnaire has been given to the students after 15 days of completing the training.

There are two phases of data analysis. The first phase is the descriptive statistics of students and the second phase is measuring the knowledge before and after the training. A dependent sample test is used to measure the training effectiveness. The difference in knowledge score has been satisfied with the assumption of normality Shapiro-Wilk normality test (W = 0.9881, p-value = 0.8801). Hence, the parametric test (pair t-test) is used to test the improvement of skills and knowledge after training.

Analysis and Results

Knowledge of the Excel among BSc Student before and after the Training

Knowledge regarding Excel among BSc students was measured by a structured questionnaire having 30 items. Each correct answer provides one mark whereas the incorrect answer and the non-response have been given zero marks. The total scores before and after the training has been presented in the histogram (Figure 1). The finding reveals that after the training the average knowledge Score is (20.73±5.27) and before the training the score was (9.35±6.35).

The finding of the difference of knowledge score has satisfied the normality by exploratory data analysis like as histogram with a normal curve (Figure 2) and Shapiro-Wilk normality test (W = 0.9881, p-value = 0.8801) it is insignificant. The findings show the normality of expectation. Hence, the paired t-test has been applied

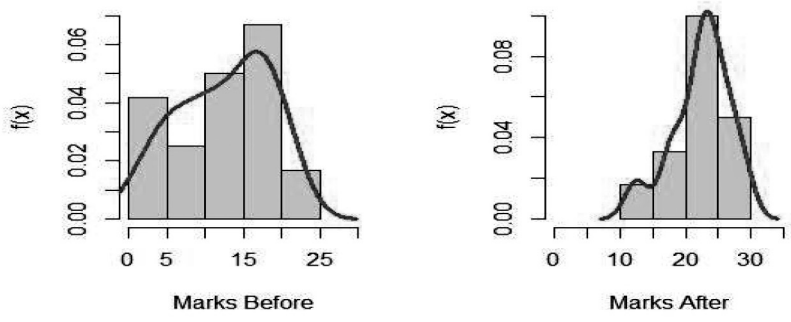

Figure 1: Histogram with Kernel Density of Pre-test and Post-test Marks

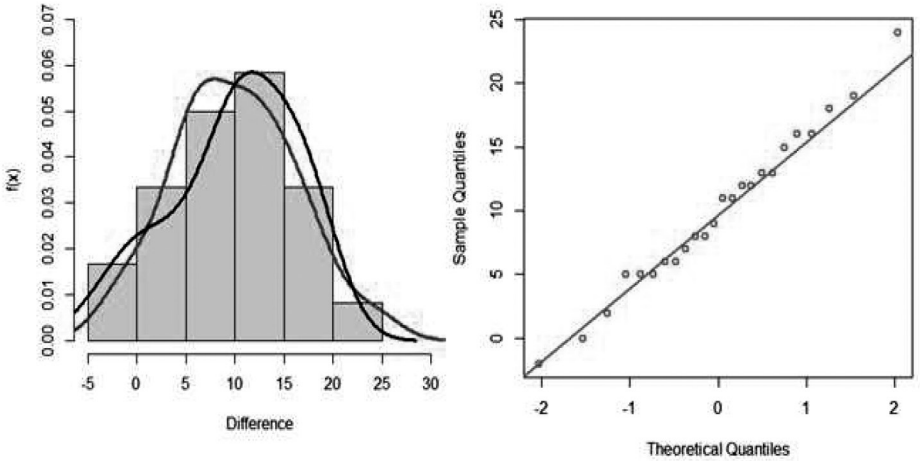

Figure 2: Histogram (Left Panel), Q-Q plot (Right Panel) of Difference of Pre-test and post-test Marks

Table 2: Mean, Standard Deviation, t-Value and p-value

	Before training	After training
Mean score	9.35	20.73
Standard deviation	6.35	5.27
t = -12.69, p-value < 0.0001		

In Table 2, the mean score after training is much greater than that of before training and the standard deviation after training is slightly lower. The t-test and p-value revels statistically significant result. Hence, the training is beneficial to improve the knowledge of Excel.

Knowledge of Excel for BSc 1st year Student before and after the Training

The total scores before and after the training of the first year students has been presented in histogram (Figure 3). The findings revel that after the training the average knowledge score (19.52±5.92) has increased as compare to before the training (9.35±6.06).

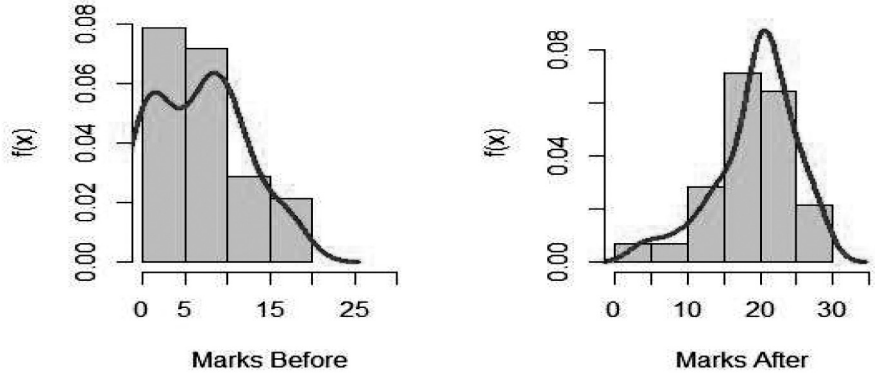

Figure 3: Histogram with Kernel Density of Pre-test and Post-test Marks first year

The finding of the difference of knowledge score has been satisfied the normality by exploratory data analysis like as histogram with normal curve (Figure 4) and Shapiro-Wilk (W = 0.95761, p-value =0.4168) which is insignificant. Hence the finding follows the normality as for expectation. Then, the pair t-test has been applied.

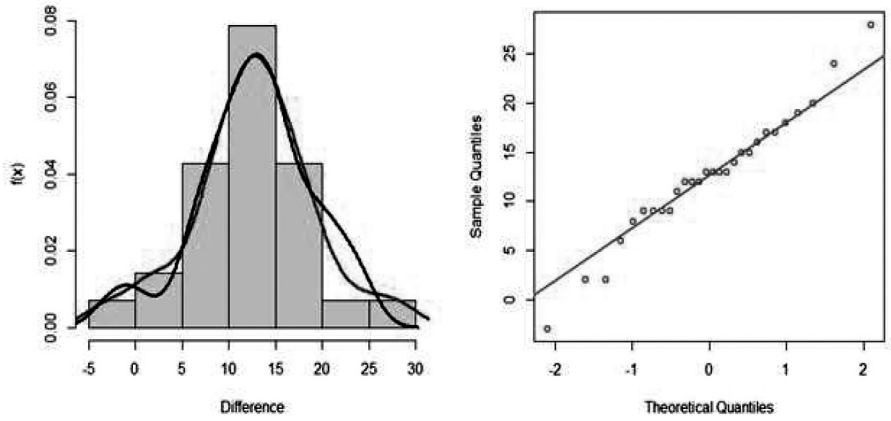

Figure 4: Histogram (Left Panel), Q-Q plot (Right Panel) of Difference of Pre-test and post-test Marks for 1st year

Table 3 : Mean Score, Standard Deviation, t-Value and p-value for 1st year Students

	Before Training	After Training
Mean Score	9.35	19.52
Standard Deviation	6.06	5.92
t = -7.976, df = 22,p-value <0.0001		

Table 3 shows the mean score of BSc 1st year students, there is statistically significant training regarding the knowledge of Excel. In Table 3 , the mean score after training is much greater than before the training, the standard deviation after training is slightly lower.

The t-test and p-value reveal statistically significant results. Hence, the training is beneficial to improve the knowledge of Excel.

Knowledge of Excel for BSc 2nd year Student before and after the Training

The total scores before and after the training has been presented in histogram for the 2nd (Figure 5). From the finding revels that after the training the knowledge score of (21.69±4.57) has increased as compare to before the training of (9.34±6.67).

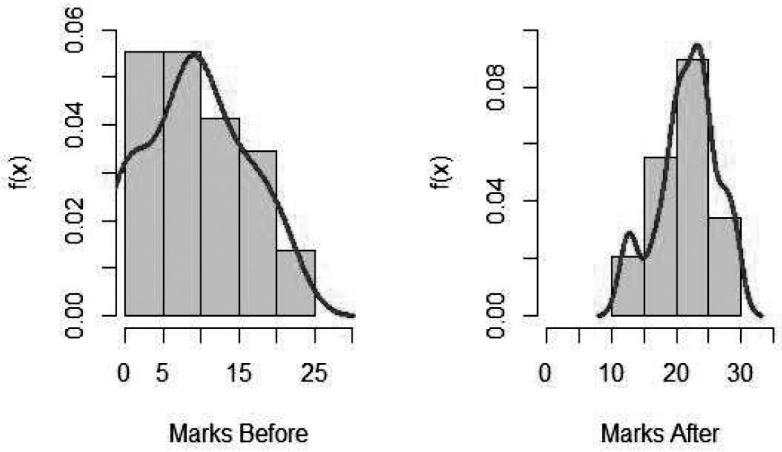

Figure.5: Histogram with Kernel Density of Pre-test and Post-test Marks for 2nd year

The finding of the difference in knowledge score has satisfied the normality by exploratory data analysis like as histogram with the normal curve (Figure 5) and Shapiro-Wilk (W = 0.97907, p-value =0.814) which was insignificant. Hence the finding follows the normality to expectation. Hence, researchers have applied the pair test.

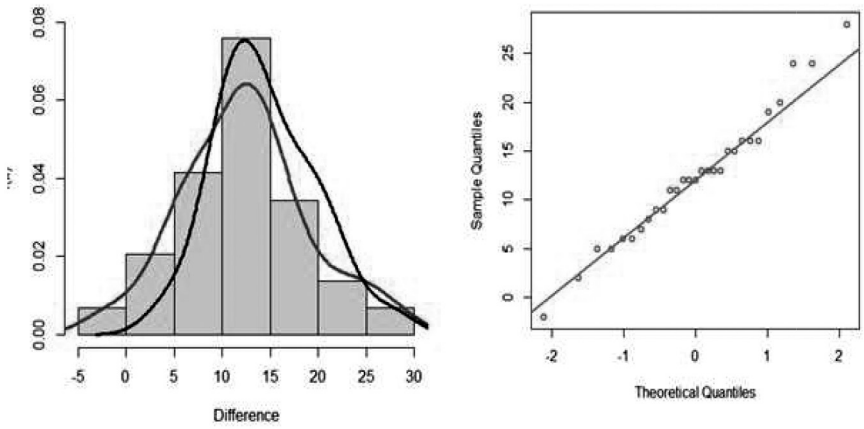

Figure.6: Histogram (Left Panel), Q-Q plot (Right Panel) of Difference of Pre-test and post-test Marks for 2nd year

Table 4 shows the mean score of 2nd-year students' pre-test and post-test scores. There is a statistically significant result of training regarding the knowledge of Excel. This finding revels that the training improved the knowledge of students.

Table 4: Mean Score, Standard Deviation, t-Value and p-value for 2nd year Students

	Before training	After training
Mean Score	9.34	21.69
Standard Deviation	6.67	4.57
t = -9.9475, df = 28,p-value <0.0001		

Knowledge of Excel for no PC Student before and after the Training (n=28)

28 students (54%) have not possessed a personal computer. Figure 7 shows that knowledge score before and after the training for no PC students has been presented in a histogram (Figure 7). After training the average knowledge score is (19.36±5.61) whereas the average knowledge score before the training was (6.75±5.39).

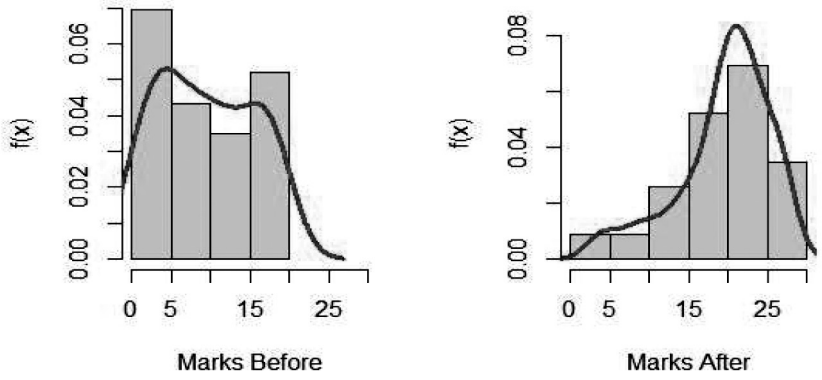

Figure 7: Histogram with Kernel Density of Pre-test and Post-test Marks for no PC students

The finding of the difference of knowledge score has been satisfied the normality by exploratory data analysis like as histogram with normal curve (Figure 8) and Shapiro-Wilk normality test (W = 0.97599, p-value = 0.746) which was insignificant. Hence the finding follows the normality as for expectation. Hence, researcher have been applied the paired t-test.

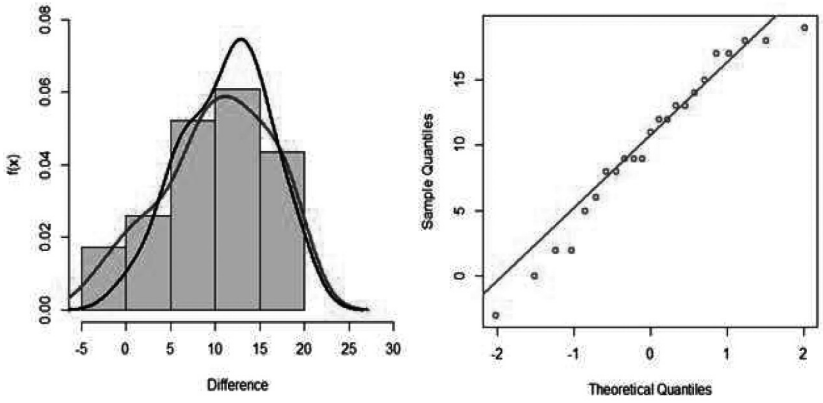

Figure 8: Histogram (Left Panel), Q-Q plot (Right Panel) of Difference of Pre-test and post-test Marks for no PC students

Table 5 shows the mean score of no PC students, there is statistically significant of training regarding the knowledge of Excel. The post-test mean score is much greater than the pre-test score and t value shows the significant result. Hence no pc students also improve their knowledge by the training.

Table 5: Mean Score, Standard Deviation, t-Value and p-value for no PC Students

	Before Training	After Training
Mean Score	6.75	19.36
Standard Deviation	5.39	5.61
t = -10.246, df = 27, p-value <0.0001		

Knowledge of Excel for PC Student before and after the Training (n=24)

The sum of the score before and after the training was presented in histogram (Figure 4.9). The finding shows that after the training the average knowledge score of (22.33±4.43) has increased as compare to before the training of (12.38±6.12).

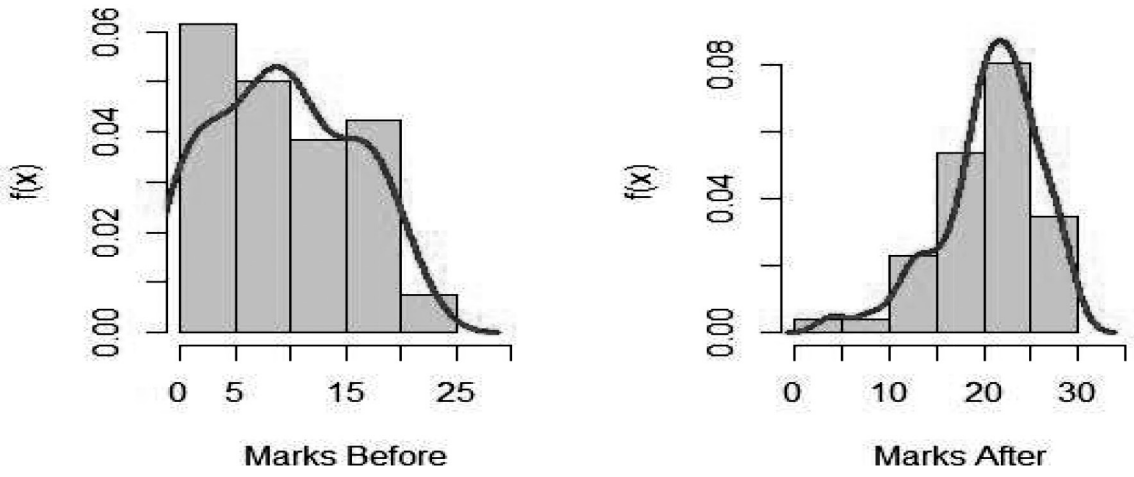

Figure 9: Histogram with Kernel Density of Pre-test and Post-test Marks for PC students

The finding of the difference of knowledge score has been satisfied the normality by exploratory data analysis like as histogram with normal curve (Figure 9) and Shapiro-Wilk normality test (W = 0.98806, p-value = 0.9896) which was insignificant. Hence the finding follows the normality as for expectation.

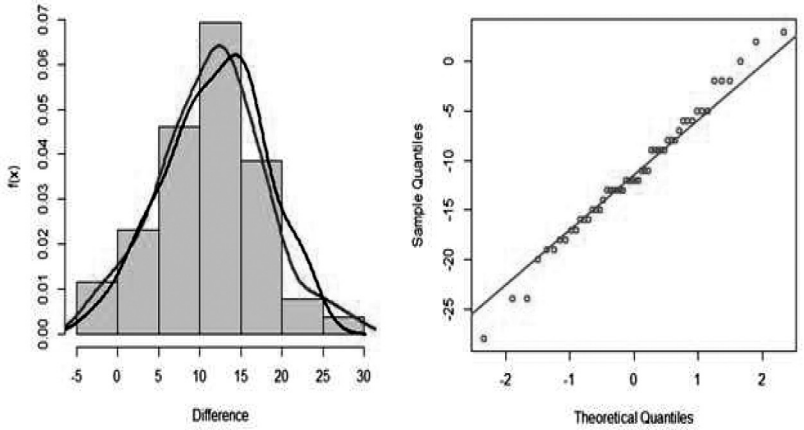

Figure 10: Histogram (Left Panel), Q-Q plot (Right Panel) of Difference of Pre-test and post-test Marks for PC Students

Table 6 : Mean Score, Standard Deviation, t-Value and p-value for PC Students

	Before training	After Training
Mean Score	12.38	22.33
Standard Deviation	6.12	4.43
t = -7.8034, df = 23, p-value < 0.0001		

Table 6 shows that there is statistically significant improvement of knowledge score after post-test than that of the pre-test score. From table 4.10 and 4.11, PC possessed students have comparatively greater knowledge score than that of no PC students.

Results of Analysis

From the analysis, the major findings are as follows:

- Among 30 objective types of questions, the students have provided minimum 0 percent to maximum 79 percent correct answers before training, whereas minimum 21 percent to maximum 94 have corrected the answers after conducting the 5 hours training for each students.
- The finding of the difference of knowledge score has been satisfied the normality by exploratory data analysis. Or it shows the normality. Then, the pair t-test has been applied.
- After training average knowledge Score is (20.73±5.27) and before the training the score was (9.35±6.35).
- The average score after training (total 52 students) is much greater than that of before training and the standard deviation after training is slightly lower. The t-test and p-value revels statistically significant result. Hence, the training is beneficial to improve the knowledge of Excel.
- Although, both 1st year and 2nd year students have improved their knowledge by the training with statistically significant results, the knowledge scores for second year students are slightly greater than that of the first year students.
- The knowledge scores for PC possessed students are slightly greater than that of the no PC students. But students with possessed PC or without possessed both have improved their knowledge scores after the training with statistically significant results.

Discussion and Conclusion

Discussion

The major findings of this study are similar to the study of Dhungana, Piryani, Chapagain, & Neupane (2015). They found that the software training was statistically significant and then effective. They found only 5.6% of the participants had adequate knowledge in the pretest whereas, after training, 27.7 % had adequate knowledge. In the present study, the average score after training (total of 52 students) is much greater than that before training and the standard deviation after training is slightly lower. The t-test and p-value reveal statistically significant results. Hence, the result of this study is almost consistent with the result of Dhungana et.al (2015). The finding of the present study is also supported by the study of Sweta, Vimal, Sharma, Kushwaha, & Kumar

(2018). They found a significant improvement in average knowledge scores after the intervention of structured teaching. The paired t-test was statistically significant with a very high level of a p-value.

Conclusion

Knowledge regarding the Excel among BSc students was measured by structure questionnaire having 30 items. Each correct answer provides the one marks whereas incorrect answer and non- response has been given the zero marks. The total scores before and after the training has been presented in histogram. The post-test average knowledge Score is (20.73±5.27) and pre-test score was (9.35±6.35). The finding of the difference of knowledge score has been satisfied the normality by exploratory data analysis with normal curve and Shapiro-Wilk normality test & it is insignificant. Hence, the pair t-test has been applied.

The average score after training (total 52 students) is much greater than that of before training and the standard deviation after training is slightly lower. The t-test is statistically significant and the training is effective for BSc level students in Birendra Multiple campus, Bharatpur.

The knowledge for PC possessed students is slightly greater than that of the without PC students.

Tribhuvan University has recommended teaching basic knowledge on statistical software through the curriculum for BSc 1st year students. But lack of personal computer with the students and lack of adequate lab facilities in the campus and no inclusion of evaluation in the final exam would be the problems that the students have not adequate knowledge on this type of knowledge.

In the present situation, students should have adequate knowledge on this type of software like excel, SPSS, R-software. Hence the university and then colleges should teach or arrange training program each year in BSc students.

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