

# Teaching Data Analysis using SPSS

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## ABSTRACT

SPSS, standing for *Statistical Package for the Social Sciences*, is a powerful, user-friendly software package for the manipulation and statistical analysis of data. The package is particularly useful for students and researchers in psychology, sociology, psychiatry, and other behavioral sciences, containing as it does an extensive range of both univariate and multivariate procedures much used in these disciplines. This paper intends to support teacher teaching forecasting based on sample dataset teach.sav.SPSS background algorithm used crosstabulation Pearson chi-square algorithm for data significant. Tech.sav was downloaded from Google and was analyzed and viewed. It used IBM SPSS statistics version 23 and PYTHON version 3.7.

**KEYWORDS:** SPSS, Crosstabulation, Data mining

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## 1. INTRODUCTION

Education, as with other industries, has evolved in leaps and bounds in recent years. Traditional pedagogical techniques, based on a teacher explaining a topic and students taking notes, may still be useful on occasion, but education today revolves more around encouraging the student to awaken their curiosity and desire to learn. A number of different teaching techniques have emerged due to this change in education. Many of these teaching techniques are not actually new! The use of technology in the classroom has simply given education a new lease of life allowing us to approach old ideas in new ways.

They should know teaching techniques are Fipped Classroom (Iverting you class), Design Thinking (Case Method), Self\_Learning, Gamificaiton, Social Media, Free Online Learning Tools. The teacher needs to know about teaching style are .Although it is not the teacher's job to entertain students, it is vital to engage them in the learning process. Selecting a style that addresses the needs of diverse students at different learning levels begins with a personal inventory—a self-evaluation—of the teacher's strengths and weaknesses. As they develop their teaching styles and integrate them with effective classroom management skills, teachers will learn what works best for their personalities and curriculum. Our guide encapsulates today's different teaching styles and helps teachers identify the style that's right for them and their students. Browse through the article or use these links to jump to your desired destination. Teaching style are the Authority, or lecture style, The Demonstrator or coach style, The Facilitator or activity style, The Delegator, or group style, The Hybrid or blended style.

### 1.1 SPSS.

Business, education, and all fields of science have come to rely heavily on the computer. This dependence has become so great that it is no longer possible to understand social and health science research without substantial knowledge of statistics and without at least some rudimentary understanding of statistical software. The number and types of statistical software packages that are available continue to

grow each year. In this book we have chosen to work with SPSS, or the **Statistical Package for the Social Sciences**. SPSS was chosen because of its popularity within both academic and business circles, making it the most widely used package of its type. SPSS is also a versatile package that allows many different types of analyses, data transformations, and forms of output - in short, it will more than adequately serve purposes.[2]

### 1.2 SPSS Crosstabs

**Crosstab** is widely used in survey results to find out interrelationships and interactions between variables . Crosstab construction and analysis is usually done through various statistical packages. Statistical package widely used to build Crosstabs. SPSS is also used for Crosstab Analysis.

### 1.3 Chi\_Square Test

The **Chi-square test** is intended to test how likely it is that an observed distribution is due to chance. It is also called a "goodness of fit" statistic, because it measures how well the observed distribution of data fits with the distribution that is expected if the variables are independent.

### 1.4 SPSS Graph

This tutorial will show you how to use SPSS version 12.0 to create bar graphs, histograms, Tukey box plots, line graphs, and scatter plots. It also includes information on editing the graphs, and printing selected parts of the output.[4]

**Table.1 Calculate Crosstab for teachers and lectures**

Count	Q5			Total
	more than 10 hrs/week	5 to 10 hrs/week	less than 5 hrs/week	
Q2 full professor	97	22	14	133
associate prof	49	15	10	74
assistant prof	55	17	10	82
other	23	12	23	58
Total	224	66	57	347

**2. Algorithm**

The notation and statistics refer to bivariate subtables defined by a row variable X and a column variable Y, unless specified otherwise. By default, CROSSTABS deletes cases with missing values on a table-by-table specified otherwise. By default, CROSSTABS deletes cases with missing values on a table-by-table basis.

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Q2 * Q5	347	96.1%	14	3.9%	361	100.0%
Q2 * Q26	348	96.4%	13	3.6%	361	100.0%

**Notation**

The following notation is used throughout this section unless otherwise stated:

Table 23-1

Notation

Notation

$X_i$

Description

Distinct values of row variable arranged in ascending order:  
 $X_1 < X_2 < \dots < X_R$

$Y_j$

Distinct values of column variable arranged in ascending order:  
 $Y_1 < Y_2 < \dots < Y_C$

$f_{ij}$

Sum of cell weights for cases in cell (i, j)

$c_j$

$\sum_{i=1}^R f_{ij}$ , the jth column subtotal

$r_i$

$\sum_{j=1}^C f_{ij}$ , the ith row subtotal

$W$

$\sum_{j=1}^C c_j = \sum_{i=1}^R r_i$ , the grand total

**Chi-Square Statistics**

Pearson's Chi-Square

$$\chi_p^2 = \sum_{ij} \frac{(f_{ij} - E_{ij})^2}{E_{ij}}$$

The degrees of freedom are  $(R - 1)(C - 1)$ .

Likelihood Ratio

$$\chi_{LR}^2 = 2 \sum_{ij} f_{ij} \ln (f_{ij}/E_{ij})$$

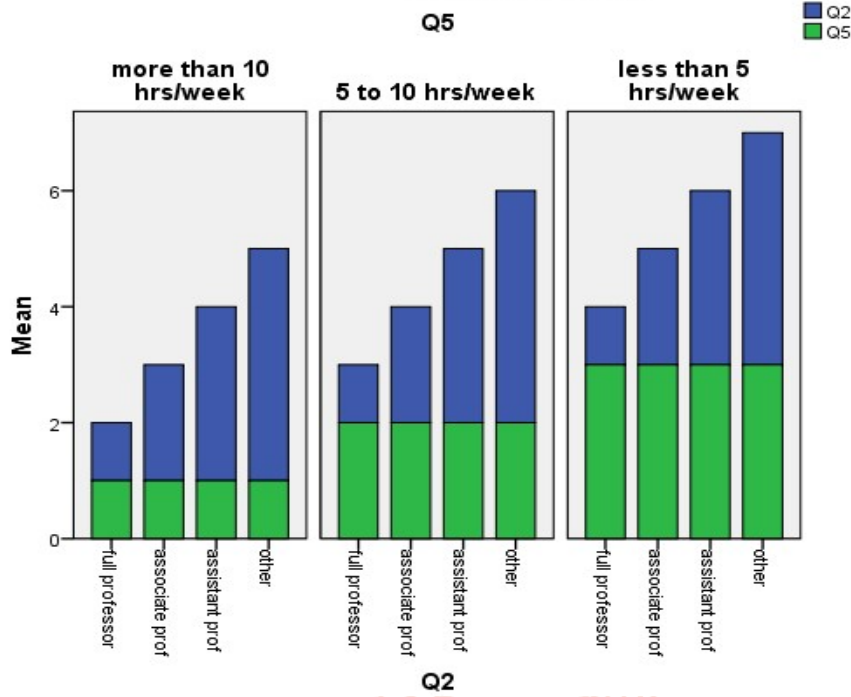
The degrees of freedom are  $(R - 1)(C - 1)$ .

**3. Testing.**

**3.1 Data Analysis view:**

As a result for table 2 and graph 1 is show row Q2 is type of teachers and Q5 is mean hours of their lectures. This graph show other teacher most lecture and then assistant professor is more than associate professor and full professor lectures less than other teachers in per week. You can know that higher rank is less lectures hours. So rank is relationship with lectures hours indirectly.

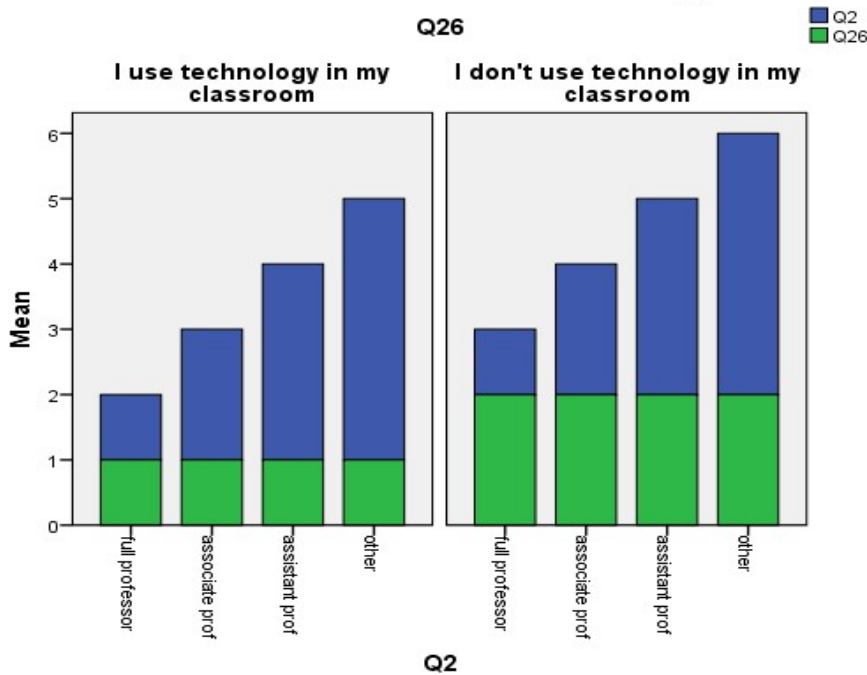
**Graph1 .Teachers & Lectures Relatiaon Graph  
Teacher & Lecture**



**Table.3 Crosstab calculation for teachers and use technology.**

	Q26		Total
	I use technology in my classroom	I don't use technology in my classroom	
Q2 full professor	86	45	131
associate prof	53	19	72
assistant prof	65	17	82
other	34	29	63
Total	238	110	348

**Graph2. Teacher & Use Technology Graph  
Teacher & use technology**



**3.2 Data Analysis View:**

AS a result below graph 2 show teachers and they technology used. Q2 is teachers and Q26 is used technology. This graph show full professor more use technology than other teachers. So other teachers need to be trained how to use technology aid teaching methods and that are more efficient in teaching and learning lessons for students. So rank is relationship with using technology directly.

**Table4. Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.913 <sup>a</sup>	3	.008
Likelihood Ratio	11.930	3	.008
Linear-by-Linear Association	.330	1	.566
N of Valid Cases	348		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 19.91.

**Table5. Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	30.977 <sup>a</sup>	6	.000
Likelihood Ratio	26.900	6	.000
Linear-by-Linear Association	19.038	1	.000
Association N of Valid Cases	347		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.53.

**3.3 Data Analysis view:**

Table 4 and Table 5 show calculate with Chi\_square methods for teachers & lecture time and teacher & used technology. As a calculation this paper understood person Chi\_Square method is significant for used variables and most efficient of teach.sav dataset.

**4. Conclusion**

SPSS is data analysis tools are valuable in social science, education, business, marketing, sale and other factcors field in used easily to decision and find data analysis. It is very good presentation with graph .This paper show teacher take lecture time, use technology with teacher rank. The rector can know what teacher to take their work and how to teach their students with background algorithm used crosstabulation Pearson chi-square algorithm for data significant. So SPSS software is useful for data analysis.

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