

Chapter 4

Maths lesson: Surveys!

Maths Department

IES Madina Mayurqa, Palma, Spain

Summary

Statistics refer to numerical facts. Statistics are very important in education as they help students to collect, present analysis and interpret data. It also helps them to draw general conclusions. This activity was done with our 3rd of ESO students (aged 14-15 years old) in October 2018.

Surveys!

Introduction

Why are statistics important in our lives? Statistics are the set of mathematical equations that we use to analyse the things that surround us. Statistics are important because today we have access to many data and much of this information is determined mathematically by statistics.

Learning objectives

- To collect data and to interpret it.
- To represent the data collected in a visual way.
- To be able to work in group.
- To be able to explain the extracted conclusions to the rest of the class.

Resources

A notebook to note down the results of the survey. 1 piece of card for each group of students. Drawing supplies (coloured pencils, rulers, etc.). Access to computers in case they want to use them to make their tables.

Activities

Day 1

Step 1 (in class): The teacher explains that they are going to work on improving their statistics skills. They watch the video: "Frequency tables". The students take notes on key statistics terms that they will use in this lesson:

- Sample Size: The total number of people that answered the survey.
- Measure of Central Tendency: The approximate middle of a data set.
- Normal Distribution: When data creates a normal curve with 50% above the average, 50% below the average, etc.
- Outlier: An outlier is a data that falls quite far from the average.

Step 2 (in the park next to our school): Students work in small groups. First they think of 4 questions to ask.



Then they collect data from people in the street or from other students in the class.



Day 2:

Step 1 (in class): Every group of students synthesises, analyses, and represents their data set. Students must include an analysis of each question, and information about their sample size, central tendency (when appropriate), and any outliers.

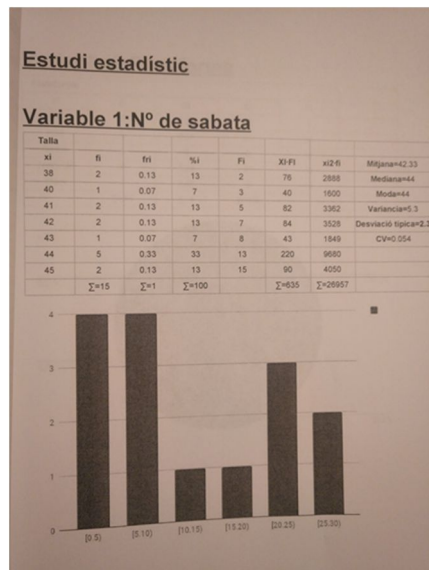
Step 2 (in class): Students present their findings to the rest of the class.

Enquesta
 Població: Alumnes de l'IES Madina Mayuça

Individus: Juan Cervantes, Diego Cirano, Toni Ivorra, Ramon Gati, Joan Cayelles, Joan Duran, Lorian Altarriba, Sergio Gonzalez, Marc Ramos, Carlos Puerto, Carlos Mantón, Alberto Cango, Fabio Luciano, Sergi Serrano, Josefina Recio

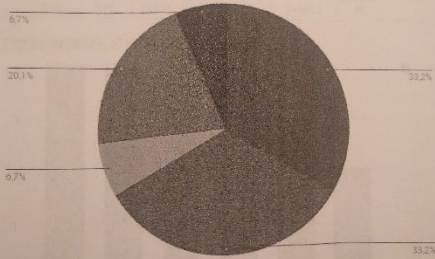
Variable 1: Quin número de sabata das?
Variable 2: Quina plataforma de videojocs utilitzes més?
Variable 3: Quantes hores jugues videojocs a la setmana?
Variable 4: Quina carrera universitària penses fer?

Individu	Nº Sabata	Plataforma	Hores	Carrera
Juan C.	43	3ds	5	Ingenieria
Diego C.	45	3ds	10	Biologia
Toni I.	45	PC	20	Biologia
Ramón G.	44	Ps4	9	No
Joan C.	42	Ps4	15	Ingenieria
Joan D.	44	PC	8	Música
Lorien A.	44	PC	30	Fisioteràpia
Sergio G.	42	Mòvil	3	No
Marc R.	40	3ds	25	Química
Carlos P.	41	PC	6	Ingenieria
Carlos M.	44	Ps4	22	Arquitectura
Alberto C.	38	Switch	3	Audiovisual
Fabio L.	41	Ps4	5	Gestoria
Sergi S.	44	Ps4	20	No
Josefina R.	38	Pe	4	Informatica



Variable 2: Plataforma

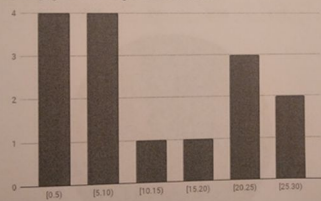
Plataforma	xi	fi	fri	%i	Fi
Pc	5	0.38	38	5	
PS4	5	0.31	31	10	
Switch	1	0	0	11	
Nintendo	3	0.23	23	13	
Móvil	1	0.08	8	15	
	$\Sigma=15$	$\Sigma=1$	$\Sigma=100$		



Variable 3: Hores a la setmana

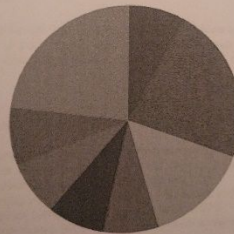
Horas	fi	fri	%i	Fi	xi	Xi·Fi	Xi ² ·Fi	Mijana=12.83
[0,5)	4	0.27	27	3	2.5	10	25	Mediana=7.5
[0,5)	4	0.27	27	8	7.5	30	225	Moda=2.57.5
[10,15)	1	0.07	7	9	12.5	12.5	156.25	Variancia=54.97
[15,20)	1	0.07	7	10	17.5	17.5	306.25	Desviació típica=7.41
[20,25)	3	0.2	20	13	22.5	67.5	1518.75	CV=0.72
[25,30)	2	0.13	13	15	27.5	55	1512.5	
	$\Sigma=15$	$\Sigma=1$	$\Sigma=100$		$\Sigma=192.5$	$\Sigma=3743$	75	

Hores jugades al llarg d'una setmana



Variable 4: Carrera universitària

Carrera	xi	fi	fri	%i	Fi
Informatica	1	0.07	7	1	
No	3	0.2	20	4	
Biologia	2	0.13	13	6	
Arquitecto	1	0.07	7	7	
Musica	1	0.07	7	8	
Fisioterapeuta	1	0.07	7	9	
Quimica	1	0.07	7	10	
Ingeniero	3	0.2	20	13	
Audiovisual	1	0.07	0.07	7	
Gestoria	1	0.07	0.07	7	
	$\Sigma=15$	$\Sigma=1$	$\Sigma=100$	$\Sigma=15$	



Comments from the learners' surveys

Our students enjoyed the lesson very much and learnt to read and interpret statistics. What they liked the most was to ask their questions to the people in the street and to work in small groups.

Final remarks

An outdoor lesson is always welcome, especially if it is Maths! This activity was really engaging and it promoted different competences such as respect towards options different from ours, creativity and interpersonal communication.

Supplementary material

Video: Frequency tables (07:18): <https://youtu.be/gdE46YSedvE>

Video: Creating a histogram (07:21): <https://youtu.be/gSEYtAjuZ-Y>

Video: Interpreting a histogram (04:28): <https://youtu.be/c02vjunQsJM>

Video: Shapes of distributions (05:06): <https://youtu.be/2oJldeE4JcU>