**Reflection Journal 19/10/2017**

Statistics can be defined as “the practice or science of collecting and analysing numerical data in large quantities, especially for inferring proportions in a whole from those in a representative sample.” – Google Dictionary. Analysing that definition, we can conclude and further elaborate that statistics can be concerned with events which have already happened and some of which may have occurred by chance. It is proven without any reasonable doubt that there is a plethora of statistic web pages each with its own vast compilation of data from hundreds of sources. In this technologically advanced age, simply filling up a form can allow anyone to get maps and graphs on all kinds of statistics with ease.

From what I can observe, there are people who own online businesses which aim to be an interactive web one-stop resource for statistics on almost every topic from food to murders. I am reading this book called, Statistical Inference (Casella & Berger), and in this book, the content is helping me understand why statistics is important. In theory, it is based on two elements: inference and prediction. Conducting research is time consuming and expensive. In addition, calculations involving probability usually are not very precise: there are often approximations as no one can accurately predict the future or record the past.

So why is it so important?

During today’s lesson I realised that what matters most is how someone is interested in how variables relate to each other and how the relations are, and you have inference. This would lead to ONE reason of why statistics are important which I will be focusing on for the rest of this reflection. Theoretically, it gives any science researcher or marketing staff the foundation to be able to effectively conduct research and surveys. Without the use of statistics, it would be extremely difficult to make decisions based on the data collected from a research project.

An engineer can be defined as someone who solves problems of interest by the efficient application of scientific principles. Engineers accomplish this by either improving the existing product or process or by designing a new product or process. The engineering, or scientific, method is the approach to formulating and solving these problems. However, without any statistics acting as a foundation, no engineer would be able to work effectively as he or she does not understand which problems occur more frequently for which product etc.

Without statistics, engineers would have problems in the engineering method which are as follows:

1. Lack of clear and concise description of the problem(s)

2. No information on any important factors that affect this problem or that may

play a role in its final solution

3. Unable to refine the model due to the basis of unavailable data

Probability and statistics are used throughout engineering. In electrical engineering, signals and noise are analysed by means of probability theory. Civil, mechanical, and industrial engineers use statistics and probability to test and account for variations in materials and goods. Chemical engineers use probability and statistics to assess experimental data and control and improve chemical processes. It is essential for today’s engineer to master these tools.

**In conclusion, statistics can be researched for data populations. Hence, statistics using probability theory and information theory are probably your best foundations for doing any work.**

Thank You and Have a Nice Day! :)