

## **Stereotypes and illusionary differences between quantitative and qualitative research methods in Papua New Guinea**

Joseph Kim Suwamaru

### **Abstract**

Beginning researchers in PNG can feel intimidated by an array of terminologies and perceived differences surrounding quantitative and qualitative research methods. Such stereotypes are neither helpful nor justified in promoting research in PNG. Rather, practical research promoting the culture of having a curious mind and being investigative should be promoted by focusing on the commonalities between quantitative and qualitative research formats. Indeed, there is much in common between these strands. Suffice it to say, that, by using software enabled qualitative data analysis, quantitative characteristics can be harvested supplying invaluable evidence. Similarly, testing the null hypothesis may offer necessary evidence for construction of meanings reflecting a qualitative dimension in research. This paper argues that, for reputable research to grow in PNG, a pragmatic approach more than anything else is required instead of time wasting debates on stereotypes and illusionary differences in quantitative and qualitative research methods.

**Keywords:** research methods, quantitative and qualitative research, practical research, correlation, CADAS, NVivo, SPSS, limitations and delimitations

### **Introduction**

The illusionary differences between quantitative and qualitative research methods may cause dislike and anxiety among researchers in Papua New Guinea (PNG). Some colleagues, I have spoken with seem to be intimidated when in discussions concerning research methods and uncertainties in making the choice of whether to adopt quantitative or qualitative research method. Using personal experiences, it can be asserted that the much popularized differences in quantitative and qualitative methods are more philosophical rather than practical in nature. It can be argued that this illusionary difference in methodological strands is often the source for unnecessary tensions which may draw the uninitiated indigenous PNG researcher into unwanted anxiety.

Pacifying the tensions from the stereotypes in illusionary differences between quantitative and qualitative methods requires clear understanding of both methods. The discussions herein confirm that the individual methods contain properties and features such that even qualitative data is sprinkled with quantitative elements and vice versa. Even quantized data such as percentages and graphs present excellent silhouettes which could be harnessed in the

construction of useful meanings. In this light, potential tensions arising from illusionary demarcation of strands may be pacified or even moderated giving the indigenous researcher some comfort.

There are good reasons why research is undertaken but the most important of all is to gain a better understanding on issues considered important for human existence and well-being. Moreover, research and development are intertwined with the potential to render an array of benefits. PNG is part of the globalized world but has unique challenges which require the cultivation of good research culture to support development aspirations of the government. Hence it is important for PNG researchers to focus on pragmatic investigations rather than engage in strand advocacy debates. Strand advocacy debates unnecessarily consume time and other resources rather than getting on with the important business of undertaking research.

### **Research topic**

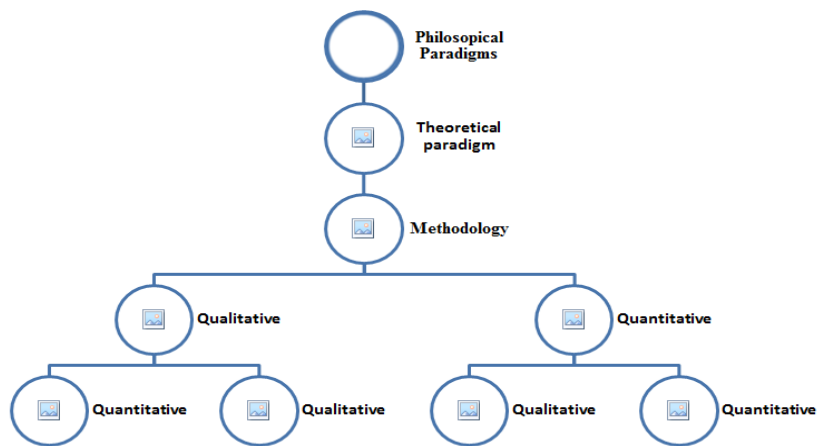
In any research, the overarching topic is the sign post upon which the modus operandi of gathering, processing, analysing and interpreting data can be designed and executed. Hence, the due diligence required in the formation of the research topic should be of high focus, order and subject to constant reflection. For the serious researcher, the research topic is an abstraction of the subject under investigation which must be all encompassing. Detailed reading as close as possible to the topic under consideration is encouraged especially in PNG where there exists lower reading and writing culture as discussed next.

The indigenous citizens, particularly in PNG and perhaps other Melanesian citizens across the Pacific, come from a culture of story-telling, song and dance (Narakobi, 1983). Together with other art, these have been the common modes of recording and propagating knowledge through generations. By and large, PNG and other Melanesians create and share knowledge using oral modes of communication. It is asserted that citizens from an oral society background may face special challenges because the culture of reading and writing may not come so naturally (Vari, 2014). This may place PNG and Melanesia in jeopardy so efforts must be made to complement this with good reading and writing habits as discussed in the following paragraph.

The holy grail of competent research is extensive and systematic literature review and writing (Vari, 2014). Indigenous researchers can benefit greatly from extensive and systematic literature review while formulating an appropriate research topic. For a country like PNG, at cross roads in its development, there remains great potential for research which indigenous researchers should embrace. A systematic literature review with an ever curious mind is an advantageous combination toward being a successful indigenous researcher. A good research topic should be well shaped and informed through an exhaustive literature review which may lead to a convenient research design.

## Designing the research

Notwithstanding the above assertions, arguments and differentiations between quantitative or qualitative strands may well be considered as secondary issues. However, it is necessary and convenient to pay attention to the pragmatic design of the research to ensure stability of the investigations. This could involve ontological and epistemological paradigms delineating the nature of knowledge and how one acquires such knowledge (Crotty, 1998). Of course, this sets the scene to identify the research methodology for the purposes of the investigations which in some cases may even be a case study. Other methodologies are equally appropriate for application and their adoption and use may be determined by the identified limitations and delimitations of the investigations (Suwamaru, 2013).

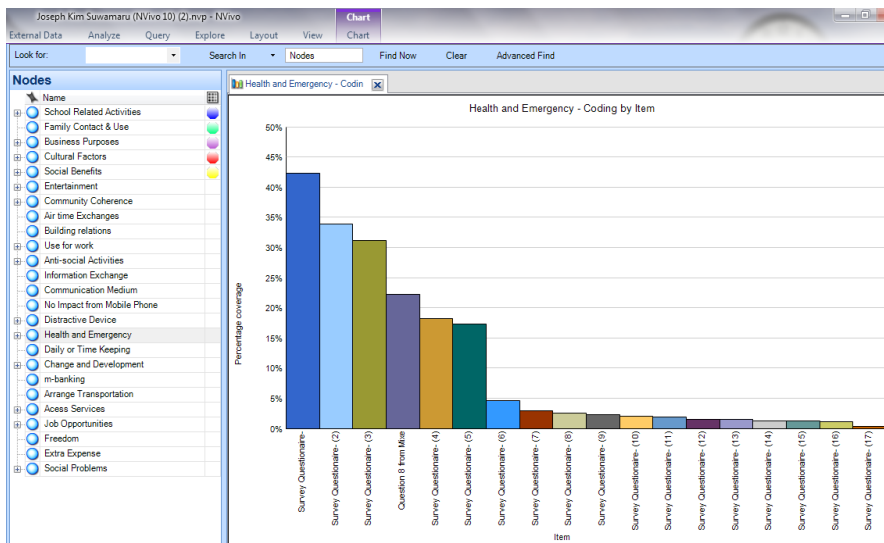


**Figure 1: Research design shows that quantitative and qualitative strands are intertwined**

The author used personal experiences gained while investigating aspects of mobile phone usage in a local PNG university where resources are limited in comparison to other international institutions. The experience gained from this study is depicted on figure 1 which illustrates that quantitative and qualitative data coexist therefore the demarcation between strands is fictitious. Practical research should be considered by indigenous researchers to conveniently achieve outcomes rather than straining resources by attempting strand specific data. Personal experiences show that quantitative and qualitative data are intertwined (see figure 1). With recent trends towards software based data analysis, there is more room for flexibility and creativity for improved construction of meaning. An array of software exists to be harnessed by indigenous researchers.

## Qualitative data analysis

Denzin and Lincoln (2011) argue that qualitative researchers focus on socially constructed nature of reality, the intimate relationship between researcher and the researched and the situational constraints that shape inquiry. Qualitative research is valued for its richness and enhanced understanding and illumination of complex human issues through textual analysis (Bazeley, 2004). This richness may be blended with quantified arguments to support claims or to accentuate the creation of meaning. Analysis of rich data leads to construction of meaning and creation of social experience through a series of representations such as field notes, interviews, conversations, photographs, recordings and memos to the self (Denzin & Lincoln, 2003). These representations of the world offered the researcher the opportunity to improvise and to create a sense that various sources of data are blended together artistically to form new meanings.



**Figure 2: Percentages of occurrences of themes from qualitative data (Suwamaru 2013)**

The ontological (the nature of knowledge), epistemological (how one acquires that knowledge) and methodological (case study) paradigms adapted to guide the local PNG study sufficiently informed qualitative data analysis. Analysis of qualitative data began in the field during interviews and observations as the researcher identified issues and concepts connected with the research questions (Denzin & Lincoln, 2003). The overall process involved data collection, data preparation, reflection on data and data coding stages followed by descriptions and themes for the report. In the final analysis, the overall qualitative analysis also produced quantitative outcomes, thereby proving that qualitative and quantitative strands are intertwined and embedded within each other (Figure 2).

## **Sampling**

There are some claims for the requirement of small sample sizes for qualitative studies and large sample sizes for quantitative studies (Denzin & Lincoln, 2003). However, this dichotomized association of small samples with qualitative studies and large samples with quantitative studies is simplistic and misleading (Onwuegbuzie & Collins, 2007). In the former, we see yet another source of unreasonable categorization between qualitative and quantitative research. In many cases the nature and context within which research paradigms are designed indeed justify small samples with quantitative studies and larger samples with qualitative studies.

Personal experiences to achieve the objectives of a locally conducted study involved a sample size for the quantitative strand of seven hundred twenty-seven participants from all regions in PNG. This was considered appropriate for two reasons; (1) against the backdrop of geographical and transportation challenges, convenience sampling was deemed appropriate and therefore adopted and (2) to ensure a statistically large sample in order to yield trustworthy tests. A sample size larger than 30 may support reliable differences in statistical mean<sup>i</sup> calculations under normal distribution<sup>ii</sup> assumptions (Kooisis, 1997). Hence, this is a statistically large enough sample size to support reliable statistical descriptive and inferential calculations through the use of software packages (Croucher, 2010).

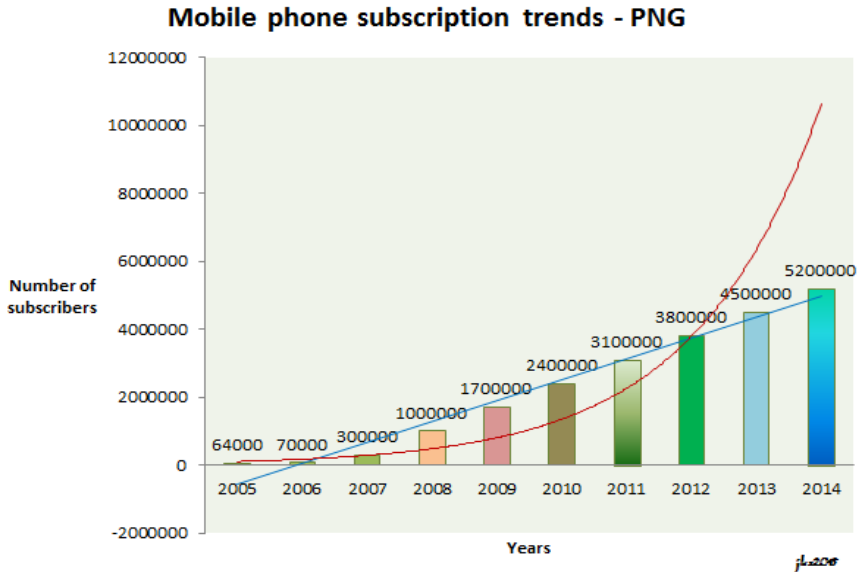
In the local PNG study, the sampling was ensured to be statistically large to support reliable statistical descriptive tests and inferences while at the same time being representative of the geographic and cultural diversity of the country. The survey form consisted of two sets of five-point Likert scales for quantitative data and a series of open-ended questions which used in tandem with the in-depth interviews from the qualitative strand. In the foregoing narrative, one soon gets the sense that even when it comes to sampling there is lack of clear-cut *modus operandi*. This further dismisses the differentiation between quantitative and qualitative methods.

## **Quantitative data analysis**

Quantitative studies emphasize the measurement and analysis of causal relationships between variables (Croucher, 2010). Validly collected quantitative data can be expressed numerically and tested statistically to add to the reliability of the research. Moreover, quantitative data analysis using statistics is either descriptive, such as percentages and means which are often presented as tables and graphs, or statistical inferential tests that allow conclusions to be drawn about the similarities or differences between the sample and the population, or between samples, or between subsets of a sample (Guthrie & Guthrie, 2012).

The essence in all these concerns the construction of meaning, thus presenting a shade of qualitative aspect from the quantitative strand. Notwithstanding this, it should also be noted from an earlier graph (figure 2), that percentages of

occurrences of themes from qualitative data may also lead to the derivation of correlations between identified variables from qualitative data. Thus, further evidence pointing to the stereotypes and illusionary differences between quantitative and qualitative research methods in PNG.



**Figure 3: Quantitative data for Mobile phone subscription trends in PNG (Source: Suwamaru 2016)**

For example, quantitative data such as that shown in Figure 3 can enable the researcher to shape constructive meanings which are qualitative in nature. Hence, I argue that the differentiation between objectivist research associated with quantitative methods against constructivist or subjectivist research associated with qualitative research is unjustified. The essence of this paper is to support this claim by using evidence from an investigation on aspects of mobile phone usages in PNG. There is further discourse that most methods known today as forms of ‘qualitative research’ have in the past been carried out in an empiricist, positivist manner. Examples of such practices include those of early ethnography research. There is further assertion that quantification is not ruled out within qualitative research because under normal daily research the researcher measures and counts as part of the due process in research (Crotty, 1998).

### **Array of quantitative procedures**

Quantitative tests range from simple frequency tests to elaborate statistical inferential analyses to harvest deeper meaning from the data. Against the backdrop of an array of available quantitative tests, the challenge is to determine the appropriate procedures under one’s circumstances. A popular way to summarize survey data uses the frequency distribution graph using Microsoft Excel, Minitab or versions of SPSS<sup>iii</sup>. This graph may display

observation per cent on the vertical scale and categories on the horizontal. The simplicity and clarity to communicate meaning should be the objective when assigning categories. One common way is to assign the category of observations equal to or greater than the lower boundary and less than the upper boundary (Oates 2009).

In quantitative data analysis it is common to assess the variability within a set of observations to ascertain the difference between the highest observation and the smallest (Croucher, 2010). Two common measures of variability are standard deviation and variance. Owing to the widespread availability of software, these tests can be easily completed without the need for lengthy manual calculations. Hence, competence in the use of software can be assiduous in producing the required parameters at the click of the mouse button. Moreover, hypothesis testing forms an important parameter in quantitative research which is performed to ascertain whether the probability of identified occurrences by chance is less than 5 per cent or 1 per cent. These levels of probability are called p-values. At these levels, the p-value results are referred to be statistically significant thus, the null hypothesis may be passed and the alternative hypothesis accepted. The acceptance of the alternative hypothesis maybe used to construct qualitative narratives about an existing theory or to formulate an interesting conclusion.

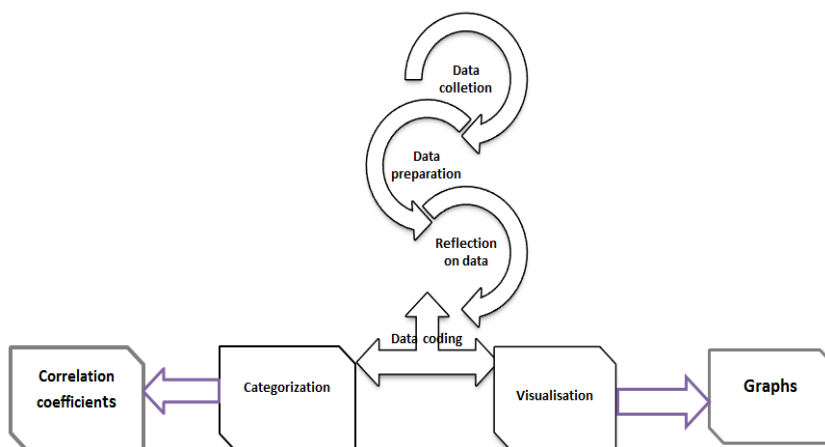
In a PNG study on mobile phones, principal components extracted through a factor analysis on a set of variables were subjected to analysis of variance tests with the null hypothesis being 'there are significant differences in mean values between regions concerning the identified principal components'. The alternative being 'there are insignificant differences in mean values between regions concerning the identified principal components'. In cases where the p-value was less than 5%, the null hypothesis was rejected or passed while the alternative was accepted or confirmed. This provided important evidence to construct meaning concerning aspects of mobile phone usages in the highlands, coastal and islands regions of PNG. The point here is that using hypothesis tests in quantitative research methods also enables qualitative paradigms to be used to create meanings on the topic of study. This gives perspective and evidence that the demarcation between quantitative and qualitative research methods is not a clear-cut argument.

### **Other experiences from PNG**

Personal experiences gained in PNG from investigations on aspects of mobile phones usages provided illumination on the processes involved from data collection to categorization and visualization (Figure 4). In-deed all phases along the data collection to categorization and visualization path are iterative and simultaneous as indicated by the cyclic arrows. This means that the researcher has the flexibility to traverse back and forth for diligence to ensure the accuracy of the collected data.

Traditionally qualitative researchers engage in manually identifying and picking themes, grouping and categorizing into layers of primary, secondary

and tertiary themes. Manually identifying and picking themes can be time consuming but is equally reliable, however when it comes to generating visualizations and correlations coefficients<sup>iv</sup>, computer aided data analysis software (CADAS) can be assiduous. The experience from PNG was gained from using NVivo throughout the qualitative data collection to categorization and visualization chain. NVivo is among a number of popular software packages that can greatly enhance the flexibility of the researcher but must be used with care and diligence to ensure credibility and trustworthiness of outcomes. As explained earlier, the use of NVivo also diminishes the demarcation lines between quantitative and qualitative strands because it is not difficult to derive or harvest one strand from the other.



**Figure 4: Quantitative data may also be easily harvested from qualitative strand**

It is important to remember that CADAS is not a replacement for researcher diligence concerning data analysis but it is an invaluable tool that can enhance productivity and efficiency. Flexibility can be greatly improved through the use of software so that when mistakes in coding or data entry are detected, corrections can easily be taken. CADAS can also afford the researcher greater transparency and accountability throughout the data collection, analysis and interpretation stages for greater reliability. Not to mention that CADAS adds to an already available mix of tools with which quality research outcomes may be realized. The indigenous researcher should be motivated to learn these tools and use them for their intended purposes.

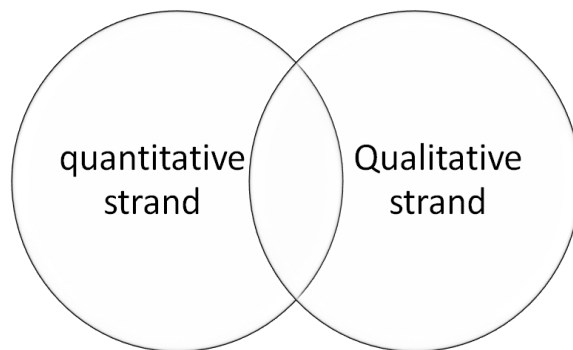
### **Pragmatic approach to research**

Indigenous researchers are often faced with challenges arising from cultural and society upbringing. Least of this is the assumed separation and the array of research terminologies that may cause doubt and uncertainty to those who may be contemplating taking on research as their future project. It is advisable for



indigenous researchers to take a pragmatic approach in research rather than get caught up in time wasting debates concerning separation of quantitative and qualitative strands.

In any research endeavour, an indigenous researcher may gain much progress by designing a coherent research encompassing a clear problem statement with a theoretical framework upon which to situate the research process. This should be well articulated and supported by an extensive and systematic literature review. The essence of the literature review is to ascertain the scale and scope of the current knowledge on the topic under investigation which should help the indigenous researcher to articulate a clear topic and the associated research questions to guide the investigations.



**Figure 5: A practical view of quantitative and qualitative data strands**

Rather than getting side-tracked by strand specific considerations, the research methodology and data collection methods should aim to capture maximum quality data. Such quality data should be guided by the research question or the hypothesis under consideration. It is from such quality data that one may diligently and appropriately engage in the coding and analysis process. This is an important stage where thoughtful juxtaposition and triangulation within datasets may be performed. Triangulation can be performed even in single strand studies between different places of data collection or between literature sources and the manifestations of the analysed data. This needs creativity, diligence and being true to the data by paying attention to the revelations in the data. More often than not qualitative narratives can be harvested from quantitative studies and likewise quantized information may flow from the qualitative branch (Figure 5).

## **Conclusions**

Indigenous researchers need to step up efforts because in the long run more research will advantageously contribute to the country's development. It is through research that indigenous people can contribute to knowledge creation while at the same time support the policy formulation process. The indigenous researchers have to take ownership of the country's development by increasing

research efforts. This may pave the way for more informed decisions based on credible research.

It matters little whether it is quantitative or qualitative data but what is more important is coherent research design informing a clear research topic formulated through a systematic literature review. The use of CADAS is highly recommended because it adds to improved efficiency and flexibility and can complementarily derive or compose one strand of interpretation from the other. With the use of CADAS, care has to be taken because analysis still remains the job of the researcher and not the software because CADAS is merely a tool to add efficiency to the process. From coding through to the construction of meaning phase, the researcher must strive to listen to the data.

With care and diligence, progress and useful outcomes can be harvested with satisfying results. The indigenous researcher has much to gain by not being distracted by unnecessary strand debates and by focusing on taking a pragmatic approach to research. Stereotypes and illusionary differences between quantitative and qualitative research methods do little to promote research in PNG.

## References

- Bazeley, P. (2004). *Issues in mixing qualitative and quantitative approaches to research*. Paper presented at the 1st International Conference on qualitative research in marketing and management at University of Economics and Business Administration. Vienna.
- Bazeley, P. (2003). *Teaching mixed methods qualitative research journal*, 3 (Special issue), 117-126, ([www.latrobe.edu.au/aqr](http://www.latrobe.edu.au/aqr)).
- Crotty, M. (1998). *The foundations of social research*. Sydney: Allen & Unwin.
- Croucher, J. S. (2010). *Quantitative analysis for management Australia*: McGraw Hill Custom Publishing.
- Denzin and Lincoln (Ed.). (2011). *The SAGE handbook of qualitative research*. California, United States.
- Denzin, N. K., & Lincoln, Y. S. (2003). *The discipline and practice of qualitative research*. In N. K. Denzin & Y. S. Lincoln (Eds.), *Strategies of qualitative inquiry* (4th ed., pp. 1-45). California: Sage.
- Guthrie, G., & Guthrie, K. (2012). *Basic research methods for Papua New Guinea*. Papua New Guinea: University of Papua New Guinea Press.
- Koosis, D. J. (1997). *A self teaching guide: Statistics*. New York: John Wiley & Sons.
- Oates, B.J (2009). *Researching information systems and computing*. London: Sage Publications.
- Onwuegbuzie, A. J., & Collins, K. M. T. (2007). *A typology of mixed methods sampling designs in social science research*. *The qualitative report* 12(2), 281-316.
- Narokobi, B. (1983). *Life and leadership in melanesia*. Suva: Institute of pacific studies.

- 
- Suwamaru, J.K. (2013). *Impact of mobile phones on socioeconomic development in PNG*. Unpublished PhD thesis, Divine Word University, Madang.
- Suwamaru, J.K. (2014). *Personal experiences with mixed methods*, DWU research journal, pp1-16, Madang.
- Suwamaru, J.K. (2016). *Modification of DOI theory – the case of mobile phones in rural PNG*, DWU research journal, pp1-pp17, Madang.
- Vari, M. 2014, December 21. *PNG lacking published research*. Sunday Chronical, p.2.

### Acknowledgements

I thank God for keeping me in good health to do the things I enjoy doing. Notwithstanding this, I accept full responsibility for any errors of fact or opinion in this article.

### Author

**Joseph Kim Suwamaru** (PhD) comes from Siwai, in South Bougainville. He earned his PhD for research on ICTs in PNG. Joseph is a contributing author of 'in-press' books '*A Time of Hope and Promise? Papua New Guinea After Independence, 1975-2015*' to be published by ANU Press, '*The Routledge Companion to Global Internet Histories* edited by Gerard Goggin and Mark McLelland' and '*E-governance in Pacific Small Island Developing States (PSIDs)*', edited by Graham Hassall and Rowena Cullen of Wellington University. Joseph lives at ENSISI Valley in Port Moresby and his email contact is pengtel@hotmail.com.

---

<sup>i</sup> In statistics, mean or average is used to derive the central tendency of the concerned data.

<sup>ii</sup> In probability theory, normal distribution function is used to model the distribution of real world phenomenon.

<sup>iii</sup> Statistical package for social science

<sup>iv</sup> Correlation coefficient indicates the strength of a relationship between variables.