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Weaknesses in terms of Diagnostic Test among Research Scholars on Non-Parametric Test across different Disciplines in Social Sciences of North-East India

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Abstract
This study attempted to find out the weaknesses of research scholars in the area of non-parametric test of statistics among the Ph.D research scholars belonging to different four disciplines of Humanities and Social Sciences such as: 1. Education, 2. Economics, 3. Geography and 4. Political Science. Moreover, it also attempted to identify the weaknesses of Ph.D research scholars belonging to different 8 Universities of North-East India such as 1. Gauhati University, 2. NEHU, 3. Mizoram University, 4. Manipur University, 5. Rajiv Gandhi University, 6. Nagaland University, 7. Tripura University and 8. Sikkim University. The researcher applied the exploratory method for the present study as it aimed to study the weaknesses of Research Scholars on non-parametric test across different disciplines of North East Indian Universities. Keeping in view the essence of the present study, Diagnostic Test has been employed as a tool for the purpose of collection of data. However, three main dimensions of non-parametric test were applied for determining the weaknesses of research scholars in non-parametric test such as Wilcoxon Signed Rank Test, Kruskal Wallis Test and Run Test. The sample comprised of 314 Research Scholars from all the selected disciplines and Universities of North-East India. Moreover, One-way ANOVA was employed for the data analysis. It is thus evident from the findings of the study that there exist significant weaknesses in the area of non-parametric of statistics belonging to different four disciplines and different eight institutions of North-East India. Based on the major findings, the researcher suggested to encourage the expert consultancy during the Ph.D coursework programme and to organize National and International level of workshops and seminars programme on the main theme of Statistical issues and concerns.

Keywords: Weaknesses, Diagnostic Test, Non-Parametric Test, Disciplines, Universities, North-East India.

1. Introduction

North-East Region of India is situated in the easternmost part of India which represents its geographical, socio-economical, educational and political administrative functions of the country. It is noteworthy that the North-East Region of India generally includes of eight states viz; Assam, Meghalaya, Nagaland, Mizoram, Tripura, Arunachal Pradesh, Mizoram and Sikkim. It therefore connects an international border to 5,182 kilometres and about 99 percent of its geographical area covers with various neighbouring

countries. It is noted that the North-East Region of India with its seven states were officially recognized under (NEC) i.e. North Eastern Council constituted in the year 1971 and later Sikkim was also declared as a part of North-East Region forming as a whole of 8 states under North-East Region.
It is worth to be mentioning that among the eight states of North-East India, Assam is considered to be highly popular disseminating knowledge especially in the field of higher education with its establishment of large number of higher educational institutions in its State. Moreover, it consists a largest number of higher educational institutions as compared to the other states of North-East India comprising the total number of existing 10 Universities namely; Assam University (central), Tezpur University (central), Gauhati University (state), Dibrugarh University (state), Cotton University (state), Bodoland University (BTAD), K.K Handique State Open University, Kumar Bhaskar Barman University (state), Don Bosco University (private) and Down Town University (private) where it offers inclusive and quality education which leads towards sustainable development and development of human resource. Apart from that, Assam comprises numerous colleges for offering various other professional courses like medical and engineering colleges catering to the exigent demands of the region as well as of the nation and as a whole. However, various other states of North-east India like Meghalaya, Sikkim, Nagaland, Manipur, Tripura, Arunachal Pradesh and Mizoram have also geared up in upbringing the quality education towards building a system which has not only enlightened the prospects of the nation but also across the globe seeking for the requisite skills and international exposure which are required for proper functioning in contemporary world.

It is also highly imperative to note that from the various courses offered by the Universities of North-East India like; Travel and Tourism, BCA, BBA, MBA, Sericulture, Environmental Science, etc are able to attract foreign students. It is further noteworthy that according to the statistical report through various prior studies, it has been depicted that most of the foreign students comes from foreign countries like Nepal, Bhutan, Bangladesh, Oman, Africa, Nigeria, Sri Lanka, Iran, and Lao mainly in seeking admission for Management and B-Tech Engineering degrees. Thus, the cultural and natural diversities of North-East Region expose a whole new experience to such foreign students.

However, this study attempts to bring awareness regarding the statistically analytical issues among the research scholars in the field of humanities and social sciences. Lack of an adequate statistical knowledge is now considered as an emerging issue of the Ph.D research programme. Hence, considering such major issue of educational researches, the proposed study has been entitled as “Weaknesses in terms of Diagnostic Test among Research Scholars on Non-parametric Test across different Disciplines of North-East Indian Universities” for finding out the major weaknesses of Statistics mainly on non-parametric test among the Ph.D research scholars belonging to social science disciplines of North-East Indian Universities.

The major dimensions of non-parametric test in the study includes as follows:

(a) **Wilcoxon Signed Rank Test**
It is non-parametric test which is used to compare the two related matched samples for determining their population differences. The assumptions of Wilcoxon Test are as follows: (i) The data should be paired and be linked with the same population and (ii) The wilcoxon-sign test assumes that the paired observation should be independently and randomly chosen.

(b) **Kruskal-Wallis Test:**
Kruskal-Wallis is a rank-based parametric test used as an alternative to one-way ANOVA where it does not accept the assumption of normality. It determines whether sample comes from a single population. It includes comparing two or more independent samples of equal or different sample sizes from one population. It helps to determine if there exists any significant difference between two or more groups of an independent variable on ordinal dependent variable. The assumptions of Kruskal-Wallis test includes the following: (i) The samples drawn from the population are random samples. (ii) The measurement scale of the dependent variable should be ordinal. (iii) The observations that we assume should be independent and (iv) All groups should consist of same shape distributions.
(c) **Run Test**
Run test is usually applicable for testing the randomness throughout the distribution process by selecting the data based on systematic order ranging + (positive) which signifies that it is more considerable than median while the – (negative) indicates that it is lesser than median. Moreover, it does not possess any certain assumptions in run test a sit belongs to the non-parametrical test.

2. Objectives of the study

The objectives of the study are as follows:

- To study the weaknesses of Research Scholars on non-parametric test across different disciplines of North East Indian Universities.

3. Hypothesis

- There is no significant differences and interactional effects in the problems faced by the Ph.D research scholars in non-parametric area of statistics while they apply in their research work across different disciplines and different universities of North-East India.

4. Delimitations of the study

1. The study is limited to only eight different government Universities of North-East India.

2. The study is limited to only four different disciplines of humanities and social sciences of different eight universities of North-East India.

5. Population and Sample of the study

As per the topic of the study, the total population of the study includes 1807 Research Scholars belonging to different disciplines and different universities of North-East India. However, the researcher has applied simple random sampling method for study where the eight government universities have been selected as a sample for the study including one university from each of the sates of North-East India viz; Gauhati University from Assam, 2. NEHU from Meghalaya, 3. Mizoram University from Mizoram, 4. Manipur University from Manipur, 5. Rajiv Gandhi University from Arunachal Pradesh, 6. Nagaland University from Nagaland, 7. Tripura University from Tripura and 8. Sikkim University from Sikkim belonging to different Humanities and Social Sciences disciplines of North-East India. The sample comprised of 314 Research Scholars from all the selected disciplines and Universities of North-East India.

6. **Methodology**

The researcher applied the exploratory method for the present study as it aimed to study the weaknesses of Research Scholars on non-parametric test across different disciplines of North East Indian Universities. Keeping in view the essence of the present study, Diagnostic Test has been employed as a tool for the purpose of collection of data. However, three main dimensions of non-parametric test were applied for determining the weaknesses of research scholars in non-parametric test such as Wilcoxon Signed Rank Test, Kruskal Wallis Test and Run Test. Moreover, One-way ANOVA has been applied for the data analysis.

7. **Analysis and Interpretations**

The analysis of the following tables 1.1, 1.2 and 1.3 represents detail analysis of the scores of weaknesses in terms of diagnostic test on non-parametric test belonging to different disciplines viz; Economics, Education, Political Science and Geography.

Dimension-wise Analysis

Table 1.1

Weakness in terms of diagnostic test on Wilcoxon Signed Rank Test in different groups

Sources of variance	**df**	**Sum of the squares**	**Mean of the square**	**F'**	**Level of significance**
Types of institutions (A)	7	9.07	1.30	3.42	.05
Types of discipline(B)	3	14.08	4.69	11.34	.01
Gender (C)	1	.12	.12	.33	Ns
AXB	21	9.89	.47	1.24	Ns
AXC	7	2.14	.31	.81	Ns
BXC	3	.73	.24	.64	Ns
AXBXC	21	7.18	.36	.95	Ns
Error	251	95.03	.38		

df=1/251 at 0.5=3.89 & at .01=6.76, df=3/251 at .05=2.65 & at 01=3.88, df= 7/251 at .05=2.0 & at 01=2.73, df=21/251 at.05 = 1.62 & at .01= 1.97

Table 1.2

Weakness in terms of diagnostic test on Kruskal Wallis test in different groups

Sources of variance	**df**	**Sum of the squares**	**Mean of the square**	**F'**	**Level of significance**
Types of institutions (A)	7	7.96	1.14	1.72	Ns
Types of discipline(B)	3	26.53	8.84	13.40	.01

Gender (C)	1	1.81	1.81	2.74	Ns
AXB	21	13.99	.67	1.01	Ns
AXC	7	4.50	.64	.97	Ns
BXC	3	2.08	.69	1.05	Ns
AXBXC	21	11.87	.59	.90	Ns
Error	251	165.70	.66		

df=1/251 at 0.5=3.89 & at .01=6.76, df=3/251 at .05=2.65 & at 01=3.88, df= 7/251 at .05=2.0 & at 01=2.73, df=21/251 at.05 = 1.62 & at .01= 1.97

Table 1.3

Weakness in terms of diagnostic test on Run test in different groups

Sources of variance	**df**	**Sum of the squares**	**Mean of the square**	**F'**	**Level of significance**
Types of institutions (A)	7	10.39	1.48	2.81	Ns
Types of discipline(B)	3	35.62	11.87	22.44	.01
Gender (C)	1	1.88	1.88	3.55	Ns
AXB	21	15.26	.72	1.37	Ns
AXC	7	3.26	.47	.88	Ns
BXC	3	1.87	.63	1.18	Ns
AXBXC	21	10.40	.52	.98	Ns
Error	251	132.80	.53		

df=1/251 at 0.5=3.89 & at .01=6.76, df=3/251 at .05=2.65 & at 01=3.88, df= 7/251 at .05=2.0 & at 01=2.73, df=21/251 at.05 = 1.62 & at .01= 1.97.

From the above table 1.1, 1.2 and 1.3, it has been observed that the 'F' ratio on non-parametric test of Wilcoxon Signed Rank Test that there exist significant differences for the types of institutions indicating the F' ratio of **3.72** at .05 level of significance and disciplines indicating the F' ratio of **11.34** at .01 level of significance, while in the case of Kruskal Wallis Test and Run Test, there do not exist any significant differences in terms of differences for the types of institutions. However, there exist significant differences in terms of differences for the types of disciplines in Kruskal Wallis Test and Run Test of diagnostic test indicating the F' ratio of **13.40** and **22.44** at .01 level of significance respectively.

Table no. 1.4

Weaknesses in terms of diagnostic test among research scholars on non-parametric in different groups

Sources of variance	**df**	**Sum of the squares**	**Mean of the square**	**F'**	**Level of significance**
Types of institutions (A)	7	125.34	17.91	3.56	.01

Types of discipline(B)	3	492.75	164.25	32.16	.01
Gender (C)	1	4.74	4.74	92	Ns
AXB	21	237.91	11.33	2.20	.05
AXC	7	26.69	3.81	.74	Ns
BXC	3	9.90	3.30	.64	Ns
AXBXC	21	90.96	4.55	.88	Ns
Error	251	1290.79	5.14		

df=1/251 at 0.5=3.89 & at .01=6.76, df=3/251 at .05=2.65 & at 01=3.88, df= 7/251 at .05=2.0 & at 01=2.73, df=21/251 at.05 = 1.62 & at .01= 1.97

Hence, it is reflected from the table no. 1.4, it has been reflected in the study that there exist significant weaknesses in terms of their types of institutions indicating the F' ratio of **3.86** at .01 level and types of disciplines indicating the F' ratio of 32.16 at .01 level belonging to North-East India and therefore it rejects the Hypotheses (H_o) where it has been stated that, "There is no significant differences and interactional effects in the problems faced by the Ph.D research scholars in non-parametric area of statistics while they apply in their research work across different disciplines and different universities of North-East India." Thus, it signifies throughout the study that the research scholars belonging from different groups of disciplines and institutions are found to be weak in non-parametric test of statistics.

8. **Educational Implications**

- Expert consultancy should be encouraged during the Ph.D course work programme.
- Research scholars should be taught in handling statistical techniques such as SPSS and R programming, etc.
- Various Seminars and workshops programmes of National and Internal level on the main theme of 'Statistics' should be organized from time to time by each of the Universities of North-East India.
- Educational surveys needs to be conducted every year in order to identify the weaknesses of research scholars in the area of statistics so that instant immediate measures can be taken out for their improvement.

9. **Conclusion**

This study attempted to find out the weaknesses of research scholars in the area of non-parametric test of statistics among the Ph.D research scholars belonging to different four disciplines of Humanities and Social Sciences such as: 1. Education, 2. Economics, 3. Geography and 4. Political Science. Moreover, it also attempted to identify the weaknesses of Ph.D research scholars belonging to different 8 Universities of North-East India such as 1. Gauhati University, 2. NEHU, 3. Mizoram University, 4. Manipur University, 5. Rajiv Gandhi University, 6. Nagaland University, 7. Tripura University and 8. Sikkim University. It is thus evident from the findings of the study that there exist significant weaknesses in the area of non-parametric of statistics belonging to different four disciplines and different eight institutions of North-East India. Based on the major findings, the researcher suggested to encourage the expert consultancy during the Ph.D coursework programme and to organize National

and International level of workshops and seminars programme on the main theme of Statistical issues and concerns.

References

[1] Orcan, Fatih. (2020). Parametric or Non-parametric: Skewness to Test Normality for Mean Comparison. *International Journal of Assessment Tools in Education*. Vol. 7. I-2, pp-255-265.

[2] Oster, Robert., Devick, Katrina., Enders, Felicity. (2020). Learning Gaps Among Statistical Competencies for Clinical and Translational Science Learners. *Journal of Clinical and Translational Science.* Vol.5. I-1.

[3] Zaini, Aida., Jamil, Haziq., Leong, Elvynna. (2021). I think I understand: Investigating Misconceptions Regarding Hypothesis Test Concepts Among University students. EdArXiv. Retrieved from https://edarxiv.org.

[4] Zajic, Jelena, S, Osmanovic and Maksimovic, Jelena Z. (2021). The Efficiency of the Application of SPSS in Higher Education Teaching: An Experimental Study. *Proceedings of the International Conference on Innovations in Science and Education (Social Sciences)*, March 17, 2021, Prague, Czech Republic. www.ISEIC.CZ, www.CBUIC.CZ.

[5] Zeynep, Medine, Ozmen., Baki, Adnan. (2021). Statistics Instructors' Perceptions of Statistics Literacy in Different Undergraduate Programs. *International Journal of Research in Education and Science.* Vol.7. I- 3. pp- 852-871.