

Critical Analysis Of Research Knowledge In Electrical Engineering Community

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Abstract— Research is an art of scientific investigation. Research is defined as defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis. In this research, different type of questions will be prepared and will be asked from the community of Electrical Engineering involved in the educational and research sector in the University of Lahore. Hypotheses and results will be generated by survey and on the basis of survey; research knowledge among the specialized community will be judged and examined. Relationships among different prospective, conclusions and results will be derived and plotted. These derivations and plots will help to improve the weak points in the specialized community and some suggestions will be drawn on research in engineering education.

Keywords: *research; surveys; research ethics; prospective of research*

I. INTRODUCTION

Research is an art of scientific investigation. Research is defined as defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis. It is basically the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions. It is thus an original contribution to the existing stock of knowledge making for its advancement.

The goals of the research are to get knowledge of the phenomenon or to discover new directions of it to draw conclusion about specific characteristics of a species or a class precisely. This will help in evaluating the frequency with which something is being happened or with which some characteristics will be associated with other characteristics. In this way, hypothesis of novel relationships between variables is tested.

The viable motivations behind doing research may be the wish to attain a research degree along with its prevailing benefits and advantages; the wish to fight

a battle of minds for solving the unsolved problems i.e., the wish to achieve the practical approach of bookish knowledge so that one could be listed among innovators, changers and respectable of society.

However, this is not the complete list of motivations behind attaining research degrees. Many other factors such as formulating government directions, improving employment related tasks, curiosity about new things, wishing to study novel relationships, social behaviors and reviving factors and persuading people to perform research operations.

Inquiry leads to pavement to progress. Doubt is always superior to overconfidence as it gives birth to inquiry and inquiry brings revolution in terms of invention. This is famous maxim of Hudson which clearly states the significance of research. Progress is directly proportional to research. Greater the research, greater will be the progress. Scientific and incipient approaches are developed by research and logical reasoning of every fact is promoted in the thinking and organization.

The role of research can never be neglected right from grass root level to mega projects level. Economic policies of the government, planning of growth of business and industry, promotion and study of social values for finding solution to social problems can be greatly improved by research.

The importance of research can also be realized from the following points. For PhD students, research may bring prosperity in terms of achieving a high rank in the society and social circle. For professionals, research is a way to earn livelihood. For philosophers and thinkers, new innovations and thoughts are floated and discussed by research. Creation of new designs and works are done by literate people through research. Prevailing and new theories can be brought in a general form by analysts and intellectuals through research.

In this research work, data is generated by survey and on the basis of surveys; research knowledge among the specialized community is judged and examined. Twenty two different questions are prepared and are then asked from the masses to derive some conclusions about the research knowledge, ethics of research and different prospective of research.

II. RESEARCH PROBLEM FORMULATION

Human social behavior towards research is evaluated. Twenty two basic questions about research are prepared and are circulated among the twenty members of faculty of electrical engineering. Circulation procedure is made with the following constraints.

1. Faculty member must belong to department of Electrical Engineering, University of Lahore.
2. Faculty member must lie in the age range of 25 – 35.
3. Faculty member must be Non- PhD.

Following are the questions asked from the members.

1. Are you fully aware of the word "Research"?
2. Research and Study are the same.
3. Research brings ease in the lives of not only the researchers but also the common people.
4. Extensive study generates the innovative ideas
5. Aims of the research can be promotions to high ranks, boost up in salaries, becoming famous.
6. Research Seminars bring highly charged brains closed to beginners.
7. As an Engineer, we should focus more on applied research than on basic research.
8. Funding is the main hurdle for promotion of research at grass root level.
9. Undergrad. Student should be fully aware of "How to Conduct Research"
10. Plagiarism maligns not only your document but also your profile.
11. It is good to write a plagiarized document than not to write.
12. I am fully aware of the ethical issues of research.
13. Labs and Energetic Supervisors are the fundamentals of conducting research.
14. I am good at Matlab or C language.
15. Number of Publications indicates that you are a good researcher.
16. Are you fully aware of the copy right issues in research?
17. Testing a relationship between different variables is also a research.
18. Government policies and regulatory bodies are based on research.
19. Discussions with colleagues make you to think the same problem with other direction.
20. Pakistani environment is fertile for research.
21. English language is the barrier in research in Pakistan
22. Societies based on research generate healthy minds.

Following are the options available for members for the above mentioned questions.

1. Highly Agree

2. Agree
3. Neutral
4. Disagree
5. Highly Disagree

III. RESULTS

Following are the results obtained after collecting information about research knowledge from the faculty members of department of Electrical Engineering in the University of Lahore.

Serial No.	Questions	Number of Faculty Members Responded to Particular Option					Did Not Respond
		Highly Agree	Agree	Neutral	Disagree	Highly Disagree	
1	Are you fully aware of the word "Research"?	4	13	3	0	0	0
2	Research and Study are the same.	0	4	1	11	3	1
3	Research brings ease in the lives of not only the researchers but also the common people.	9	8	1	2	0	0
4	Extensive study generates the innovative ideas	9	9	2	0	0	0
5	Aims of the research can be promotions to high ranks, boost up in salaries, becoming famous.	7	3	6	3	1	0
6	Research Seminars bring highly charged brains closed to beginners.	6	8	4	2	0	0
7	As an Engineer, we should focus more on applied research than on basic research.	7	10	1	2	0	0
8	Funding is the main hurdle for promotion of research at grass root level.	6	13	0	1	0	0
9	Undergrad. Student should be fully aware of "How to Conduct Research"	9	5	5	1	0	0
10	Plagiarism maligns not only your document but also your profile.	9	7	3	0	0	1
11	It is good to write a plagiarized document than not to write.	2	1	1	4	12	0
12	I am fully aware of the ethical issues of research.	3	6	10	0	1	0

13	Labs and Energetic Supervisors are the fundamentals of conducting research.	8	9	3	0	0	0
14	I am good at Matlab or C language.	7	9	4	0	0	0
15	Number of Publications indicates that you are a good researcher.	3	8	7	1	1	0
16	Are you fully aware of the copy right issues in research?	4	10	3	2	1	0
17	Testing a relationship between different variables is also a research.	2	12	6	0	0	0
18	Government policies and regulatory bodies are based on research.	1	2	7	8	2	0
19	Discussions with colleagues make you to think the same problem with other direction.	5	12	3	0	0	0
20	Pakistani environment is fertile for research.	1	2	6	4	7	0
21	English language is the barrier in research in Pakistan	5	1	1	7	6	0
22	Societies based on research generate healthy minds.	8	9	3	0	0	0

IV. GRAPHICAL RESULTS

Data generated by circulating the survey performa to faculty members is plotted graphically with the help of Microsoft Excel Sheet. These graphs are plotted basically to derive some conclusions and hypothesis about the knowledge of research from the specialized community.

Figure 1 depicts that 85 % of the faculty members are fully aware of word research. 70 percent of the faculty members consider research and study are not the same and is shown in figure 2. 85 percent of the faculty members consider research as a source of bringing ease in the lives of not only the researcher but also the common people and is shown in figure 3.

Extensive study generates innovative ideas. Study is the foundation of new idea as idea in any field can never be treated as new unless extensive study over specific field is done. 90 percent of the faculty members are agreed with it and is shown in figure 4. 50 percent of the faculty members are agreed with the motivations of research that is career boost up, becoming famous and good handsome salaries. 30 percent of the faculty members are neutral over the

mentioned motivations and is shown in figure 5. A hypothesis can be generated that nearly 50 percent of the faculty members want to add social service and welfare as a motive of research.

Research seminars play a significant role in bringing new minds towards research as seminars provide a platform for researchers to share their contribution with the common masses and new minds. Nearly 70 percent of the faculty members are agreed with the role of research seminar mentioned in the question of survey and is shown in figure 6. Applied research brings revolution in the everyday's life. Comforts of life are brought into reality by applied research. Engineers are directly related to applied research. 85 percent of the faculty members are agreed with the importance of applied research and is shown in figure 7.

Funding is always required for applied research as applied research leads to invention. 95 percent of faculty members are convinced over the fact that funding is the main source of promotion of research to grass root level and it is shown in figure 8. Being an engineer, applied research is always the main motif and funding is the fundamental component of applied research. Specialized community should be more focused on research so that their students could grasp maximum of it. It is highly encouraging result that 70 percent of the faculty members are persuaded to develop a habit of research in under-graduation level so that they could do fruitful research tasks in their higher level of studies and is depicted in figure 9.

Plagiarism is infact a disease. It kills not only your creative skills but also your personality and profile. A person looks like an image of someone instead of his / her own image. 80 percent of the faculty members are agreed with the side effects of plagiarism and is shown in figure 10. This result is highly appreciating that the faculty members are aware of the effects of plagiarism. 60 percent of the faculty members discourage to write a plagiarized content and are of the opinion that it is better not to write and this is shown in figure 11.

Research is always weighed on a scale of ethics. A researcher should be aware of the ethical issues of the research. Only 45 percent of the faculty members are aware of the ethical issues related to research and is depicted in figure 12. A hypothesis can be drawn out of this result that 55 percent of the faculty members require a lecture over the ethical issues so that this percentage could be made higher and a quality of research could be improved with the knowledge of moral grounds of research.

Research not only rates institution but also researchers. State of the art laboratories and energetic supervisors are the fundamental components of research. One cannot imagine of any kind of research without them. 85 percent of the faculty members are agreed with the mentioned requirements of research and is shown is figure 13.

Matlab and C language are the fundamental softwares in field of Electrical Engineering. Every

electrical engineering student uses these softwares not only in laboratories but also in final year projects. C language and Matlab projects related competitions are arranged by department of Electrical Engineering to encourage the students to develop skills of these softwares. 80 percent of the faculty members recognize the importance of these softwares and are equipped of these softwares and it is depicted in figure 14.

Number of publications is not the only factor of rating any researcher. There may be other factors as well like impact of publications, practical approach of publications etc. That is why, only 55 percent of researchers are agreed with the rating of researcher based on number of publications and is shown in figure 15.

A copy right issue is the prevailing curse and is shaking the moral roots of the research. In figure 16, it is shown that 70 percent of the faculty members are fully aware of this issue.

The simplest form of research is to test a relationship between different variables and in figure 17, it is quite evident that 70 percent of the faculty members recognize this test as a form of research.

Failure and success of the government policies and regulatory bodies' tasks are based on the impact of such policies and tasks on common masses. It is unjust to implement any policy without taking into consideration of public surveys and reports. With respect to Pakistani environment, only 15 percent of the faculty considers that government policies are made on research and is shown in figure 18. A hypothesis is generated from result that more than 80 percent of the faculty is agreed with the fact that government policies should be made on research so that its negative outcomes could be altered to positive outcomes.

Discussion plays an important role in research. It is infact a basic part of team work. It sometimes leads to more responsive conclusion or puts researcher on track or helps in finding the unexplored or non-discussed direction of research. More than 85 percent of the faculty accepts the importance of discussion in research and is shown in figure 19.

Prosperous society is judged by the fertility in research. Pakistan is an under developed country. Very limited funds and attentions are allocated for research. However, during the last decades, governments have focused on research and foreign and local scholarship programs are initiated to prepare a nursery to promote research in the institutions. However, only 15 percent of the faculty members consider Pakistan as a fertile land for research and is shown in figure 20. A hypothesis can be generated from the result that more than 80 percent of the faculty wants more efforts from the government to promote research and they think that previous efforts are limited are not yet fruitful.

English language can be the barrier in research where English is not the mother or first language. However, only 30 percent of the faculty considers it as barrier and is shown in figure 21.

Healthy minds are the emblem of societies based on research. 85 percent of the faculty members consider it as a true and is depicted in figure 22.

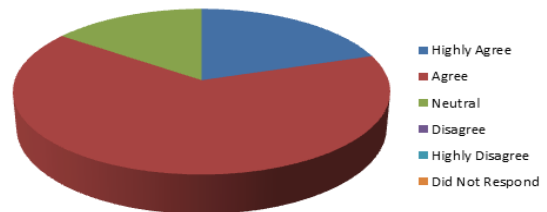


Figure 1: This figure shows the result of Are you fully aware of the word “Research”?

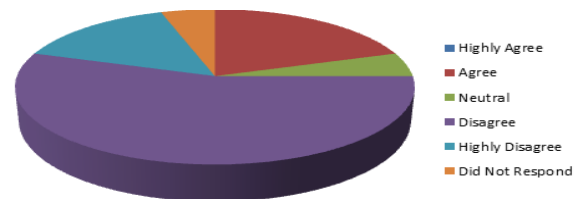


Figure 2: This figure shows the result of Research and Study are the same.

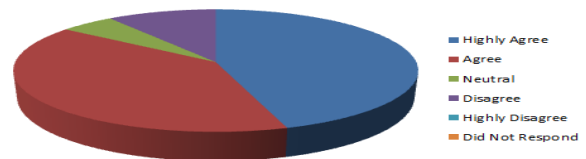


Figure 3: This figure shows the result of research brings ease in the lives of not only the researchers but also the common people.

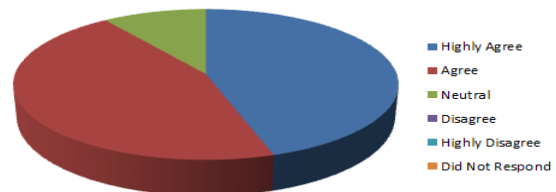


Figure 4: This figure shows the result of extensive study generates the innovative ideas.

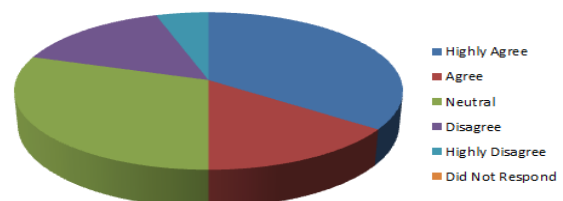


Figure 5: This figure shows the result of aims of the research can be promotions to high ranks, boost up in salaries, becoming famous.

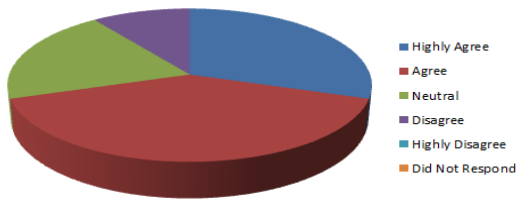


Figure 6: This figure shows the result of research seminars bring highly charged brains closed to beginners.

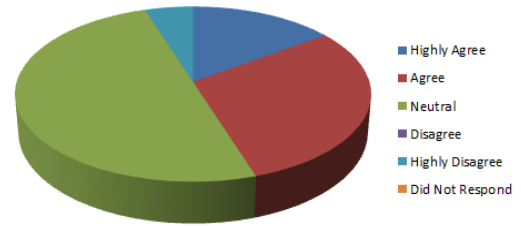


Figure 12: This figure shows the result of i am fully aware of the ethical issues of research.

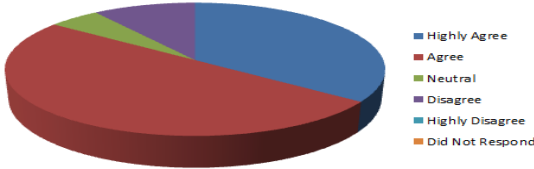


Figure 7: This figure shows the result of as an Engineer, we should focus more on applied research than on basic research.

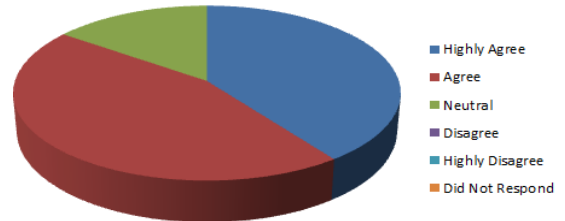


Figure 13: This figure shows the result of labs and energetic supervisors are the fundamentals of conducting research.

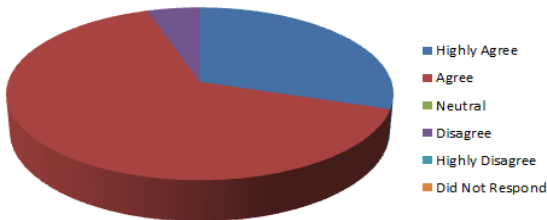


Figure 8: This figure shows the result of funding is the main hurdle for promotion of research at grass root level.

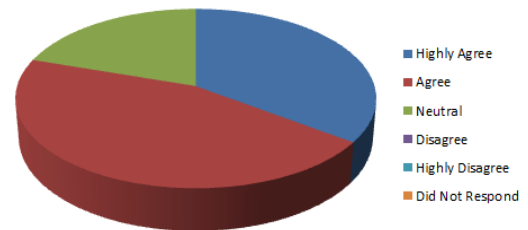


Figure 14: This figure shows the result of i am good at Matlab or C language.

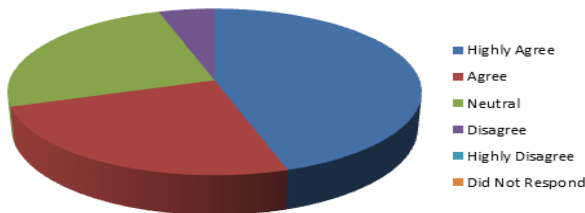


Figure 9: This figure shows the result of undergrad. Student should be fully aware of "How to Conduct Research".

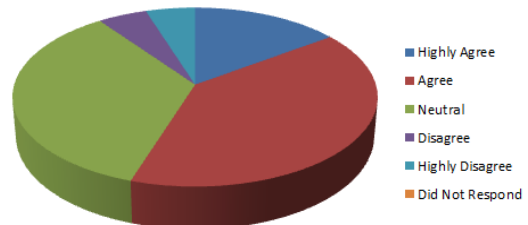


Figure 15: This figure shows the result of number of publications indicates that you are a good researcher.

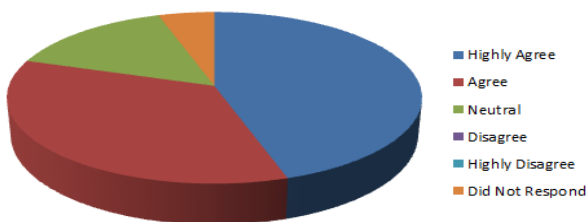


Figure 10: This figure shows the result of plagiarism maligns not only your document but also your profile.

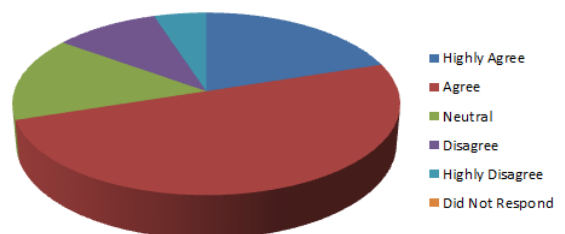


Figure 16: This figure shows the result of are you fully aware of the copy right issues in research?

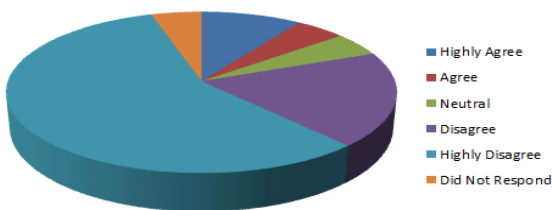


Figure 11: This figure shows the result of it is good to write a plagiarized document than not to write.

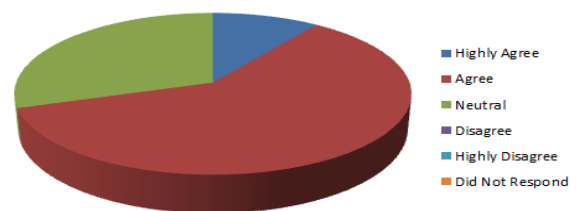


Figure 17: This figure shows the result of testing a relationship between different variables is also a research.

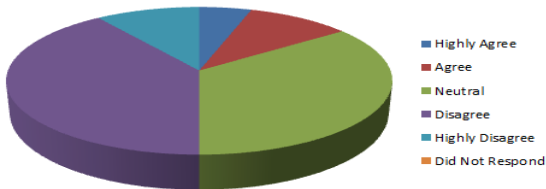


Figure 18: This figure shows the result of government policies and regulatory bodies are based on research.

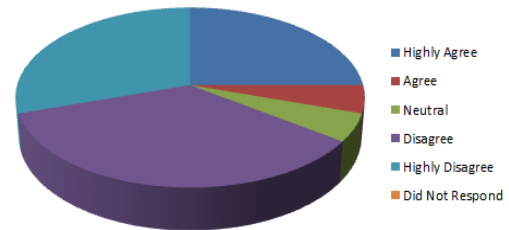


Figure 21: This figure shows the result of English language is the barrier in research in Pakistan

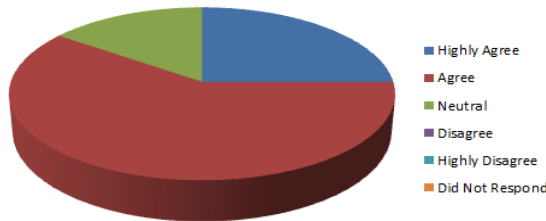


Figure 19: This figure shows the result of discussions with colleagues make you to think the same problem with other direction.

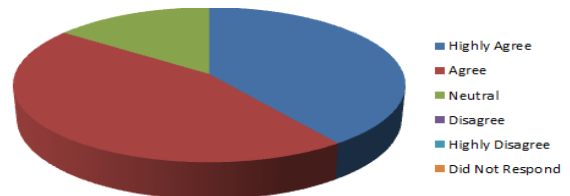


Figure 22: This figure shows the result of societies based on research generate healthy minds.

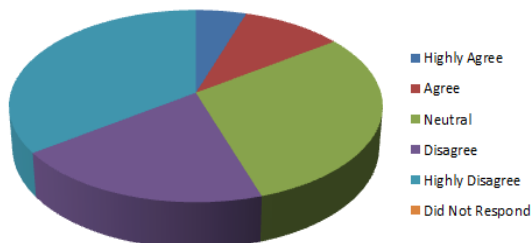


Figure 20: This figure shows the result of Pakistani environment is fertile for research.

V. CONCLUSION

A comprehensive analysis on research knowledge of Electrical Engineering community is performed. It is found that more than seventy percent of the faculty members of Electrical Engineering are aware of the word research, its aims, parameters and its promotion to grass root level. Eighty percent of the faculty members consider plagiarism a curse that will not only affect one's own profile but also the research quality of institution. Almost all the people of Electrical Engineering community consider limited funds as a barrier in the promotion of applied research. Very few people consider English language as a hurdle in research in Pakistan. There is a need to address the ethical issues of research in a more comprehensive way as very few faulty members are aware of the moral grounds of research. Secondly, more efforts from the government side are required to emerge Pakistan as a country focused more on research to generate healthy minds and it is also the responsibility of members of electrical engineering community to find new directions by promoting discussions and by earning maximum benefits from the supervisors having exposure of research in

abroad. This will not only establish state of the art research laboratories but also build confidence on the ongoing research in Pakistan.

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BIOGRAPHY

Raheel Muzzammel received his B.Sc. Electrical Engineering Degree from Department of Electrical Engineering at University of Engineering and Technology, Lahore, Pakistan and M.S Electrical Engineering Degree from Department of Electrical Engineering at University of Lahore, Lahore, Pakistan. Currently he is working as an Assistant Professor in the Department of Electrical Engineering in the University of Lahore, Lahore, Pakistan. His research interests include research methods, power systems and medical imaging.