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INCLUSION OF LOGIC IN CURRICULA OF SOCIAL SCIENCES AT HIGHER EDUCATION LEVEL

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ABSTRACT- Present study aimed at assessing the extent of knowledge of logical reasoning and further suggesting the inclusion of logic as a course in the social sciences at higher level. It was a mixed method study. Data was collected through questionnaire and interviews.Findings of the study showed gaps in knowledge of the logical reasoning on the part of the scholars. It was found that there was a need of including logic as a course in the curricula of social sciences at higher level research programs. Overall findings seemed to favor the idea of inclusion of logic as a course in the curricula of social sciences at higher level.

Keywords: logical reasoning, inclusion, curriculum, social sciences

I. INTRODUCTION

Logic is a branch of knowledge which deals with the validity of arguments. It is a study of thought. It studies thought to judge whether it is right or wrong. In this sense, its point of view is normative rather than descriptive. There may be any subject under research or discussion, but logical reasoning does matter. Knowledge of logic will help you in building valid arguments. Formally, logic is a branch of philosophy, the branch of philosophy concerned with analyzing the patterns of reasoning by which a conclusion is properly drawn from a set of premises, without reference to meaning or context (Collins English Dictionary, 2011). Formal logic is divided in two major categories i.e. deduction and induction. It is a branch of philosophy which sets criteria for the truth and validity of thought and studies it in this angle (Maroof, 1995). Deduction is a systematic method of deriving conclusions that cannot be false when the premises are true, especially one amenable to formalization and study by the science of logic. Induction is a process of reasoning used, especially in science, by which a general conclusion is drawn from a set of premises, based mainly on experience or experimental evidence. The conclusion goes beyond the information contained in the premises and does not follow necessarily from them. Thus an inductive argument may be highly probable and may lead from true premises to a false conclusion.Then there are logical fallacies, which indicate misconception on the part of scholar when he/she is trying to prove or disprove something, but foundation of his/her reasoning is on false or illogical grounds.

Research in almost all fields of knowledge is chiefly matter of probing and analyzing logically. Researchers in all fields of knowledge make research questions, hypotheses, assumptions etc. They collect data and analyze them to infer something. Much emphasis is laid on teaching research methodology, but no attempt has ever been made to equip the scholars (except those who study philosophy formally) with basic rules of logic which are very much essential for inferring results and defending one's position, with the result that quality of research has been questioned by scholars in diverse disciplines. Even, quality of scientific approach has been a popular topic for debate (Levin & O'Donnell, 1999; Mosteller&Boruch, 2002; Shavelson& Towne, 2002). There is a crucial need that such matters be addressed seriously. As knowledge of logical reasoning will go a far way in establishing and maximizing quality of research, it becomes pertinent to first assess knowledge of logical reasoning of scholars, especially those conducting research in social sciences, because in scientific studies, the proper use of scientific method is sufficient to draw conclusions. Here, interpretation does not involve logical twists, because measurements and data

are concrete and you just calculate results and draw conclusions. In social sciences, situation is different, where two opposing arguments can both be true according to context and you are to weigh logical grounds and decide which one is weightier than the other. When you want others to accept your conclusions or point of view, it becomes your responsibility to provide them solid and logical reasoning. It is a complex network of abilities that helps you understand other's point, generate reasons for your own point, decide what to accept or what to reject etc. (Bradley, 2014).

Everyone has common reason to some extent and everyone does decide, at times, logically without knowing its logical ground. Sometimes, we decide right thing accidently. But the thing is that one should know and consciously try to draw logical conclusions and it is essential on the part of research scholars whose decisions are going to cast influence and might change course of action in some instances. Moreover, even logical conclusion may lead you to wrong decision, if other alternative had even stronger logical grounds. I think, this is one of important pitfalls in which some scholars fall who take things superficially. This study aimed to do assessment with a view to suggesting inclusion of logic as a study course in the curricula of research in higher studies in social sciences.

In logic, rules of deductive reasoning and inductive reasoning are established. Moreover, logicians have categorized certain logical fallacies scholars fall a prey to. If they are well versed with logical reasoning, it will be far better for them and save time and money from useless arguments. Their research findings will be more concrete and their results and conclusions more valid and tenable. This will contribute to the quality of overall research. Opinions may be collected from scholars and recommendation be made to include logic as a subject in core courses of higher research in, especially, social sciences.

Purpose of the study was to do need analysis regarding the study of logic, establish its necessity of being included in curricula of social sciences at higher level and finally recommend its inclusion. The objectives were set to identify gaps in context of logical expertise on the part of researchers in their research endeavor and to assess need for logical expertise required for higher research in social sciences.Considering the constraints of time and resources, the study was delimited to M. Phil and Ph. D scholars of institutes and departments of social sciences and their faculty members of University of the Punjab, Lahore, Pakistan.

Quality research has become a major topic of debate today. It is being claimed that even scientific research is lacking quality of credibility and is weak in predicting ability (Levin & O'Donnell, 1999; Mosteller&Boruch, 2002; Shavelson& Towne, 2002). Among many reasons of the low quality of research is the lack of knowledge of logical reasoning in scholars. Quality research and quality evidence are two different things. Quality evidence belongs to research-based knowledge and summative collection of research on a specific topic that answers specific and important questions, on the other hand quality research belongs to the scientific process (Raudenbush, 2002; Shavelson& Towne, 2002). Hence, it can be imagined how far knowledge of logical reasoning contributes to the quality of overall research.

As quality research relates to scientific process, it addresses the judgment of alignment between methods and research questions, selection of subjects, measurement of outcomes, biasness and errors in inference (Boaz & Ashby, 2003; Lohr, 2004; Shavelson& Towne, 2002), errors, especially, in inferences occur owing to the lack of knowledge on the part of the researcher.

II. METHODOLOGY

Participants

All M. Phil and Ph. D scholars in social sciences disciplinesand faculty members were population of this study. In sciences, scientific method is used which is compact and determined, but use of logical arguments is frequently used in social sciences where one has to interpret human responses and derive plausible and logical conclusions. Therefore, need of knowledge of logical arguments were more relevant in social sciences than natural and pure sciences. As the study was basically concerned with inclusion of logic as a course of study in higher research of social sciences, the population comprised all M. Phil and Ph. D scholars in three faculties i.e. Faculty of Behavior and Social Sciences, Faculty of Arts and Humanities, Laboratory High School, SohailIftikhar Research Institute and Faculty of Education of University of the Punjab, Lahore. Sample was drawn from M. Phil and Ph. D scholars in social sciences disciplines from 14 departmentsand faculty members of these departments of University of the Punjab.Stratified sampling technique was used. Selection of the departments was purposive keeping in view the relevance, use and larger implication of logic as a course of study.

Procedures

This study was a mixed method research in nature including numerical data obtained through dichotomous type questionnaire and some interviews.Two instruments weredeveloped by the researchers comprising one dichotomous type questionnaire seeking responses from research scholars of social sciences departments of the University of the Punjab and the other a constructed interview seeking the views of faculty members of social sciences departments of the University of the Punjab. Instruments addressed two main constructs of 'comprehension of logic' and 'need of logic as a course of study'. Instruments were piloted and further improved with the consultation of experts in the field. Ethical considerations were observed at all steps of the research. Faculty members were consulted and their permission and time were taken before conducting the interviews. There was a volunteer assistant who jotted down the main points of the interviews.

Collected data were analyzed through SPSS. Frequency and percentage of responses from dichotomous type questionnaire were calculated.Data from interviews were converted into major themes, codified and then analyzed as per rules of content/discourse analysis.Data were taken through two instruments i.e. interview comprising five open ended questions and a questionnaire comprising 36 statements of logical reasoning requiring dichotomous responses in the form of true or false. Interviews were conducted with three senior most professors from Institute of Education and Research, University of the Punjab, Lahore as a purposive sampling. Questionnaires were filled by M. Phil and Ph. D scholars from various departments of the University of the Punjab. Data were collected by the researchers themselves.

III. RESULTS

Data wereanalyzed and the results showed gaps in knowledge of logical reasoning on the part of the scholars. Interviews were conducted with the senior members of IER as purposive sampling for time constraints. Two thirds of the interviewees favored the idea of inclusion of logic as a course in the curricula of higher studies in social sciences. However, they held different views regarding the quality of research at their institute. Overall results of the study identified gaps of knowledge of logical reasoning and favored its inclusion in the curricula of social sciences.

All of the interviewees were of the opinion that there was a strong link between knowledge of logical reasoning and quality of research. However, upon the quality of research at IER, they differed in their views regarding degree of quality, but they, more or less, held the view that quality of research at IER was overall good, rather, 'highly great' in the words of one respondent. At the same time most of the interviewees favored the idea of including a course of logic in the curricula of scholars.

First question of the interview was, "To what extent research and logical reasoning are interrelated?" All the three interviewees agreed that there was a strong link between logical reasoning and research. Rationale of the study cannot be put forward without logical reasoning and that logical reasoning presupposes its knowledge, of course. Logical reasoning is crucial at every step of conducting research in any field.

Second question of the interview was, "What is your perception about quality of research in your institute at M. Phil/Ph. D level?" There were positive responses overall, differing only in the degree of positivity. One respondent said that quality of research in IER was average, with a room for further betterment and improvement. Another respondent said that the quality of research was good. Still another told the researchers that the quality of research in IER was 'highly great'.

Third question of the interview was, "To what extent, in your opinion, knowledge of logical reasoning does contribute to the quality of research at higher level?" All the three respondents were highly convinced that there was a great contribution of knowledge of logical reasoning to the quality of research at higher level. One respondent said to the researchers that contribution of the knowledge of logical reasoning was well evident in sample selection, analysis, conclusions and justifications of the study.

Fourth question of the interview was, "What are factors responsible for the low quality of research at higher level, especially, in IER?" One respondent denied that there was low quality of research at IER. The respondent, who had claimed that quality of research at IER was average, said that factors responsible for the average quality were wrong and unrealistic expectations of the scholar from the supervisor. Most of the scholars, according to him, expected readymade material from the supervisor. They were not mentally prepared to work hard. On the other hand, supervisors were normally over occupied and

overworked. They had to do many official tasks along with supervising the scholars. He admitted too that the supervisors were responsible for this state of affairs as well. Still another respondent, who had claimed that the quality of research was good at IER, proposed the following suggestions to improve the situation:

1. Research committee should comprise 3 to 5 members who are skilled and competent in the field of research.
2. Courses should be revised.
3. Work load of supervisors should be lessened. At least their remuneration should align with that of private sector to boost up the motivation level of the supervisors.
4. Scholars should be encouraged to complete their projects.
5. Public seminars for scholars should be arranged.
6. Supervisors should stay in their offices for most of the time for their availability to the scholars.
7. Scholars should not be enforced to select the research area they are not interested in.
8. Only relevant supervisors should be allotted to the supervisees. They should supervise only in their respective field of specialty. On the other, hand scholars too should not skip or change their already chosen area.
9. There should not be any politics in academic affairs. Supervisors should work honestly, irrespective of their personal likes and dislikes. They should observe professional ethics, but 'here, all are Aristotle's.

The fifth question of the interview was, "What do you say about inclusion of logic as a course of study in curricula of higher study in social sciences?" One respondent claimed that logic was already included in the research course and was discussed frequently. Hence, no need of logic. Another respondent said that it would be better if a course of logic be included in the curricula of higher research. The third respondent too appreciated the idea of inclusion of logic in the curricula, but regretted the fact that there was no expert of logic at IER who would teach such a course.

Questionnaires were distributed among M. Phil and Ph. D scholars. Turnout was 37. Responses of these scholars are hereby presented in table form for better description.

Table 1

Responses of M. Phil and Ph. D scholars regarding knowledge of their logical reasoning

Respondents	Program	Discipline	Correct Responses	%	Incorrect Responses	%
1	Ph. D	Education	21	58	15	42
2	Ph. D	Education	17	47	19	53
3	Ph. D	Education	15	42	21	58
4	Ph. D	Education	24	67	12	33
5	Ph. D	Education	19	53	17	47
6	M. Phil	History	20	56	16	44
7	M. Phil	History	14	39	22	61
8	M. Phil	History	17	47	19	53
9	M. Phil	History	16	44	20	56
10	M. Phil	History	19	53	17	47
11	M. Phil	History	21	58	15	42
12	M. Phil	History	22	61	14	39
13	M. Phil	History	18	50	18	50
14	M. Phil	History	20	56	16	44
15	M. Phil	History	19	53	17	47
16	M. Phil	History	13	36	23	64
17	M. Phil	History	16	44	20	56
18	M. Phil	Education	18	50	18	50
19	M. Phil	Education	19	53	17	47
20	M. Phil	Education	15	42	21	58
21	M. Phil	Education	15	42	21	58
22	M. Phil	Education	15	42	21	58
23	M. Phil	Education	13	36	23	64

24	M. Phil	Education	13	36	23	64
25	M. Phil	Education	16	44	20	56
26	M. Phil	Education	15	42	21	58
27	M. Phil	Education	19	53	17	47
28	M. Phil	Education	18	50	18	50
29	M. Phil	Education	18	50	18	50
30	M. Phil	Education	17	47	19	53
31	M. Phil	Education	15	42	21	58
32	M. Phil	Education	11	31	25	69
33	M. Phil	Education	19	53	17	47
34	M. Phil	Education	18	50	18	50
35	M. Phil	Sociology	17	47	19	53
36	M. Phil	IBA	21	58	15	42
37	M. Phil	Special Education	21	58	15	42

IV. FINDINGS

- Research scholars of social sciences have insufficient knowledge of logical reasoning.
- Faculty members of social sciences departments express the need of inclusion of logic as a course of study at higher level.
- There is need of experts of logic in social sciences departments.

V. DISCUSSION

Topic of the study was, "Inclusion of Logic as a Course in the Curricula of Social Sciences at Higher Education Level". Study was conducted with the purpose of assessing knowledge of logical reasoning of scholars and further identifying if there was need to include logic as a course in the curricula. Literature provides little research in this aspect of research. In literature, we find just standards of quantitative and qualitative research; different paradigms of research; ways of ensuring validity and reliability; different data analysis tools etc.but rules of logical reasoning, their need and importance and role of such knowledge in quality of research are little there. It is taken for granted that scholars at higher level do know logical reasoning and make use of it as such in their research endeavor, findings and conclusions, but results of the present study did not support this misconception.Therefore, it was a unique study in a way and might have been beneficial for future curriculum designing for higher studies in social sciences. For this purpose two instruments i.e. dichotomous type questionnaire and interview were used by the researcher. Data were collected from the M. Phil and Ph. D scholars from social sciences departments and their faculty members of University of the Punjab, Lahore. Data were analyzed and the results showed gaps in knowledge of logical reasoning on the parts of the scholars. Interviews were conducted with the senior members of IER as purposive sampling for time constraints. Two thirds of the interviewees favored the idea of inclusion of logic as a course in the curricula of higher studies in social sciences. However, they held different views regarding the quality of research at their institute. Overall results of the study identified gaps of knowledge of logical reasoning and favored its inclusion in the curricula of social sciences.

All of the interviewees were of the opinion that there was a strong link between knowledge of logical reasoning and quality of research. However, upon the quality of research at IER, they differed in their views regarding degree of quality, but they, more or less, held the view that quality of research at IER was overall good, rather, 'highly great' in the words of one respondent. But the responses of the scholars regarding knowledge of their logical reasoning did not tally with the optimistic picture presented by the interviewees. It might be that they were unconsciously favoring their institute. They might think it a threat to their self-esteem to accept openly the low quality of research emerging from little knowledge of logical reasoning. One interviewee claimed that logic was already included in the courses of studies in higher research, while the other two interviewees held the opinion other way round. As researchers, themselves, are part of IER, they know that no such course of logic is included in the curricula. Perhaps the respected member of the faculty might have considered logic informally and casual way that it was a part of the studies, but in reality logic is not included formally as a subject in at not only IER, but also other departments of social sciences of University of the Punjab, except department of philosophy. Reality

is clear from the low marks gained by the scholars. At the same time, most of the interviewees favored the idea of including a course of logic in the curricula of scholars.

As was evident from the table, not half of the respondents (18 out of 37) had been able to give fifty percent correct answers, not to speak of 100 % correct answers. Most of the respondents (19 out of 37) gained below 50 marks. Maximum correct responses of a respondent were 24 (67%).Minimum marks gained by a respondent were 11 (31%). Extreme correct responses(11, 24) on both sides were single ones. Most of the correct responses across respondents ranged between 15 and 21, both numbers included. There was no significant difference between scores of Ph. D scholars and those of M. Phil scholars, as was evident from table 1. It meant that research scholars' level of being in M. Phil or Ph. D did not affect their scores. Logical reasoning is natural and normally native to individuals, but it does not improve until and unless one tries to improve it. It is an art to marshal facts and derive sound and logical conclusions and, of course, avoid inconsistency.

From the results of the interviews and responses of the scholars, it can be deduced that scholars have not knowledge of the logical reasoning up to the mark. No one could secure 100 % marks in the questionnaire. Majority of the scholars could not give even 50 % correct responses. It means that knack of logical reasoning is deficient in almost all scholars. Length of study matters little, until one learns the basic rules of logical reasoning. Need of inclusion of logic in the curricula of scholars had already been expressed by most of the interviewees.

In the light of the results of interviews and questionnaire, discussion and conclusion, following recommendations were given:

- Logic should be included as a course of study in the curricula of higher studies in social sciences.
- Present staff of teaching to scholars should be equipped with skill and knowledge of principles of logic, if they feel any deficiency in this regard.

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