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Exploring the possibilities of incorporating Indian logic in modern academia

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Abstract

Indian Logic was an integral part of education and was used as a tool of reasoning as well as a methodology for learning other Shastras. In current education this would incorporate a method of analysing the subjects studied, engaging in purposeful discussions, and rectifying what has been learned. This could assure that students can question what is learnt to give rise to new knowledge that is constantly being refined. In understanding the possibilities of incorporating Indian Logic into current academics a semi-structured interview schedule was used to interview ten participants, who are scholars of Indian Logic and have completed at least Vidwat in Nyaya. The participants were in the field of teaching, research or both and were from the age group of 30-55 years. Their views about Indian logic and its relevance to current times were explored. The findings throw light on the current quality of education and absence of innovation. With regards to Indian Logic, the findings indicate that its scope in academics pertains to encouraging alternative patterns of thinking, providing a structured tool of reasoning, equipping students with skills of debate and discussion and providing a degree of proficiency over oratory skills. Bridging the gap between existent concepts of logic and teaching them in classroom was found to be essential. The implications, limitations and recommendations have also been discussed in this study.

Key words: Academics, quality of education, Indian Logic, reasoning, thinking, debate, oratory skills

Introduction

India has had its own elaborate system of logic since a very long time; in the book, “A Primer of Indian Logic according to Annama Tarkasamgraha”, it is mentioned how the logic systems of the Indians and Greek developed independently of each other to a certain extent. Usually Indian Logic is described by the phrase Nyaya- Vaisesika system and was not only a grammar of thinking but also an orthodox system of philosophy; stress was put on the methodical science of reasoning (Vidyavacaspati & Sastri, 1951) ^[18].

Nyaya’s methods of analysis and argument resolution determined much of classical Indian philosophical debate, literary criticism, and jurisprudence (Dasti, 2019) ^[3]. Matilal describes Indian Logic as the “systematic study of informal inference-patterns, the rules of debate, the identification of sound inference vis-à-vis sophistical argument, and similar topics” (Matilal, 1998) ^[9]. Knowing Nyaya allows the person to adhere to a rational process and follow a sequence of cognitive steps that ensure that a person is able to differentiate the true from the false; the student thus avoids false beliefs or teachings by thinking constructively (Sivan, 2018) ^[16]. This meant that students of Indian Logic did not take any information on the face value, every information was open to being analysed but through the means of objective measures specified in this system.

It can be understood that Logic as a discipline allows students to form sound arguments, ask constructive questions to rectify existing pool of knowledge or come to newer conclusions; all of these can be considered essential for effective education. This is because any knowledge is not stagnant and students do not take in any information as true until proven. Currently, Indian education focuses on rote learning and recalling information for the purpose of evaluation

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(Mody, 2009) ^[10]. This may have an impact on the students' capacities to think creatively. In addition, conceptual understanding and its application in varied settings is something that is not always encouraged. Students are not encouraged to think critically or rationally about the information that is learned (Joseph, 2017) ^[6]. Besides that, the quality of education is varied thus, there is differential education provided to the population (Kapur, 2018) ^[7]. Indian Logic incorporates the use of mechanisms of rigorous and cognizant reasoning that is similar to the concept of critical thinking. Indian logic encourages development of the nature of rationality and provides methods of critical inquiry. There is a dearth of research that focuses on the scope of Indian system of logic but its relevance in education in earlier times and its method of critical enquiry can be brought into current education.

The importance given to the study of Logic is justified since its purpose was to equip individuals with the skill to rationally come to a conclusion after looking at the proofs available. To be able to examine their decisions and their beliefs by addressing them with proper reasoning can be considered as a component of critical thinking. When a person engages in critical thinking, they have to consider all the alternatives and then evaluate them fairly before finally making a choice. Thus, using a systematic means would provide a clear standard and allow an individual to present ideas in a structured as well as organised manner. Logic, in Indian Education, thus played an essential role of instilling in the students the capacity to examine objects of knowledge on the basis of evidences.

Methods

Settings and Participants: The Participants interviewed were selected from Karnataka Sanskrit University and Poorna Prajna Vidyapeetha (College) both of which are situated in Bangalore. The participants of the research were scholars of Indian philosophy who had significant knowledge in the field of Nyaya Shastra or the Indian Logic system. The participant pool identified themselves as male and they belonged to the mean age of 43.2 years. Out of the ten participants, eight (8) participants are predominantly in field of teaching and two (2) participants are in the field of research; all the participants belong to middle socio-economic background.

The participants were selected on the basis of certain criteria- (1) the inclusion criteria for the selection of participants mandated that the participants had at least five years of experience in the field of Indian Logic system either as a teacher or as a researcher, they were required to have the qualification of Vidwat in Nyaya at the least. The participants were also selected based on whether they could communicate in English or Hindi as the preferred language for the interview. (2) The exclusion criteria for selecting the participants required them to be active in either the field of teaching or researching in Indian Logic keeping into consideration that all the participants had the knowledge of the field in the present milieu.

The interviews were conducted according to the schedule of the participants and perceived thematic saturation was kept into account after which the data collection was stopped.

Study design: These interviews were conducted in Hindi and English languages (which were the criteria for inclusion). Out of all the participants 9 of them were interviewed in person and one of the participants was interviewed over phone; the

interview length ranged for thirty minutes to an hour for all the participants

Data collection: The participants were interviewed on the basis of a semi-structured interview schedule which were used, along with the forms for informed consent and demographic details, to get information about their demographic details as well as to throw light on the research question for the study- "What are the possibilities of incorporating Indian Logic in modern academics?" The questions asked intended to know the participants' understanding of the current quality of education, their views regarding Indian Logic, its role in encouraging alternative patterns of thinking, and its relevance as well as applicability in education and practical settings respectively.

The interviews were audio recorded for the purpose of analysis.

Data analysis: The audio recordings collected during the interviews were translated, as and when required, to English and subsequently transcribed. Grounded Theory was adopted as the research paradigm considering this area of research has limited number of studies; hence, the purpose was to collect data on the basis of which a theory could be generated. Grounded theory is primarily concerned with systematically collecting data followed by analysis to subsequently generate a theory. It is utilized as a way of bringing out behaviours in a group or social relationships (Noble & Mitchell, 2016) ^[11].

Keeping the research paradigm into consideration, the data was analysed by the means of Thematic Analysis. Thematic analysis identifies, offers insights and organizes data systematically into themes across a data base. Thematic analysis focuses on the themes so that a researcher could make sense of the data in terms of shared and collective meanings (Braun & Clarke, 2012) ^[1]. The transcriptions of the interviews were rearranged into codes which was done by identifying phrases or sentences (which were paraphrased) and the various codes identified were arranged into different themes. All the themes led up to the major finding which was identified.

Results (findings)

The analysis and interpretation of the data were classified into different themes and the major finding that emerged from it was that of.

Adapting the concepts of Indian Logic to include alternative thinking processes in education: Indian Logic has been studied as a tool of reasoning which could be implemented as a methodology to study other Shastras. Following the constructs of Indian system of Logic in discussions and debates, students could make sound arguments saturated with enough proofs and examples. Considering that the current quality of education highlighted the lack of conceptual knowledge and research, the contribution of Indian logic to analyse and present the information with precision could be beneficial to the students. The relation of Indian logic system and critical thinking rests on the ability of the individual to question and discuss about any information and modify or rectify it for the purpose of refinement of knowledge. The ability to present one's ideas with substantial proof or backing thus making the information more credible and reliable is also an important factor in it. These are aspects of Indian logic that had emerged through the interviews. It was reflected that the need for changing the

trends in academics could be related to the ability of individuals to think and analyse information they come across. But the innate complexity of Indian philosophies that arise due to the language used in writing them and the dearth of demand for these literatures make it all the more important that these concepts be adapted to fit the current context so that it can reach majority of the population.

When talking about Indian Logic as a tool of reasoning, its role among other Indian philosophies has been considered synonymous to the role of mathematics in science, i.e., as a tool of reasoning of different fields in the ancient Indian system and understand them. All the respondents shared how the Nyaya system is the means of reasoning to derive knowledge. One of the respondents (R4) mentioned that, "Indian logic system is a comprehensive module produced for the better understanding of the cognitive process and analysis of cognition", he explained that the Indian system of logic equips people to reason on the basis of observation, analogies and infer the validity of the cognition or knowledge attained in a critical manner. The respondents also mentioned that through logical reasoning the information becomes steadfast and convincing; it also makes the brain sharp and enhances capacity to question.

Indian Logic system is a very systematic means of deriving knowledge from any information. 90% of the total number of participants brought up the structured and compact nature of Nyaya. The respondents mentioned how systematic method of analysis in Nyaya takes into consideration every dimension of any information and analyse it with proof and thorough discussion. The validity of every argument is checked through the four means of knowledge in Indian Logic (Perception, inference, analogy, verbal testimony) because of which subjective bias is rejected. This emerged from the respondents view of the process of thinking and reasoning in Indian logic. R1 talked about how "Indian Logic has an advantage of Parsimony because of which a person reaches the conclusion using fewer steps but with precision".

The participants emphasized on the role of Indian Logic in equipping students with the capacity to, validate arguments with proof, question presented information, take different points into consideration to find a resolution and be open to consider various perspectives for one situation. The respondents highlighted the contribution of Nyaya to the critical inquiry of information. Two of the respondents mentioned that, there is a thorough investigation of information through the means of questioning to understand Vyapti (Cause and effect relationship) between two components. The respondents brought how India Logic encourages thorough thinking and rationalism which helps to develop intellectual capacity. Respondents shared that Nyaya Shastra encourages students to not accept any statement as valid without extensive proof and reach a conclusion only after thorough discussion that is not hasty. Because of this, students develop analysing capacity and their intelligence is refined. The respondents also mentioned that because students of Indian Logic question the truth and falsehood of knowledge, they develop the 'Viveka' to correct and modify their knowledge pool whenever needed. Two of the respondents who were interviewed explained that in Indian Logic every information is open to be probed from different angles and even in debates the opponents have to listen and gain through understanding of each-others' points before refuting it; thus, individuals speak only after extensive thought. When explaining the way any information or definition is properly reasoned even in classroom setting, one

of the participants, said that, "In Nyaya we have a particular way of examining definition, the Nyaya lists three fallacies- Avyapti or under-pervasion, Ativyapti or over-pervasion and Asambhava or impossibility, if the definition clears all three fallacies then the definition is correct". He explained that in Nyaya short and precise steps are used to examine any information and only after fulfilling all the criteria can someone accept a definition.

When they were asked about the importance of discussions as a part of Logic in attaining knowledge all the participants highlighted that the rules in Indian Logic made the use of language and the discussion precise (Vaada was given importance as a means to come to a decision). Two of the participants, when talking about the use of language in Indian Logic explained that students of Logic had to develop the skill to listen and form precise counter-arguments based on the arguments of opponents, this would reduce confusion and overlapping of viewpoints. The conclusion that is drawn from such a debate would be based on facts and reason; this according to the participants is absent in modern debates where listening is given importance. This practice of debate enhanced communication skills in students according to one of the participants. On similar lines another respondent mentioned that through the means of these discussions, "their (A person's) thinking develops very much because they keep on refining the information or definition (Lakshana Parishkara). After coming to a conclusion, they once again work towards refining that and making it precise". When talking about classroom discussions, three of the participants explained that Indian education gave importance to discussions as a means of constantly rectifying and refining knowledge, students were allowed to question teachers for that purpose. One of the participants explained on similar lines and added that this could result in "out-of-box thinking" because the freedom provided by Nyaya Shastra to question holds that "every information is subject to revision and when various viewpoints are considered and listened" and there are chances that newer ideas would arise that wasn't there before. He also mentioned that, the person should not lose focus of the main point in discussions, and the points put forward have to be done in a direct manner. This ensured that less time was consumed in putting a point and more time was spent in refinement of the topics itself.

The participants also discussed about the applicability of Nyaya which according to them could be brought out of educational settings and incorporated into more application-oriented or social settings. One of the participants (R4) mentioned that "concepts of Nyaya can be used in modern sciences also because they too have hypotheses that have to be proven", he explained that if the principles of debate and accepting or rejecting hypothesis was used in science it would be very beneficial to critically evaluate the validity of the same. Three of the respondents, (R3); (R5); (R6), talked about the application of Indian Logic in computer sciences, artificial intelligence, linguistics and Natural Language Processing. But that is not the only application of Nyaya, according to respondent R9, the person who knows Nyaya could translate his knowledge to the social aspect of his life. He said "The person will ask if I should follow this age-old tradition or not believe or follow it", this capacity to question social roles can bring about a social change. Another respondent said that, "a student of Nyaya would not be eccentric and completely go against the existing system or blindly follow them, he would learn to balance between the two". Another respondent, R7, mentioned in his interview that "If someone knows Nyaya

and if someone knows Math then he can think in innovative ways in science; both are used as mediums to learn other Shastras or science.”

One of the concerns every respondent had was that Indian Logic in its traditional form could not reach out to the majority of people. The literature of Indian Logic has been written in Sanskrit and even though translation of all the works could be very helpful everyone might not be committed to the idea. Three of the respondents talked about the importance of teaching concepts of Indian Logic in a modified form in different ways- by either isolating specific concepts and teaching those, introducing newer textbooks with modern examples explaining the concepts, or adopting modern methods of teaching such as power point presentations, to explain the concepts. This way even if the students are not acquainted with Sanskrit language, they could learn those concepts. Two of the respondents talk about the importance of collaboration between scholars of Indian Logic and academicians who could work together to find a middle ground to ring these concepts into classrooms. All the respondents talked about how Debate could be included in classroom and the Nyaya method of debating could be used. One of the respondents, R7 said that, “debates are not happening today, debates should be conducted in all aspects- languages, science and mathematics to increase the precision in learning”, he said that applying the concepts and sharing knowledge through the means of debate could be very beneficial for students. Respondents R10, and R8 also mentioned the importance of separating a significant amount of time and devoting it to teaching the concepts to both teachers and students.

The participants also shared their views regarding the current quality of education and focussed on the lack of innovation and primary encouragement of examinations to evaluate students' capabilities, which could contribute to overall stress among the students; lack of research was also something pointed about by all participants. The discrepancies in the quality of education provided was a matter of concern for one of the respondents. Two of the participants mentioned that, the “current education system as we have today is bound to textbooks and there is only focus on theory” this view was shared by 60% of the total respondents. Another participant shared that in the current education there is very less focus and time given to Samshodhan (Rectification, refinement) of the information even if students are competent as well as intelligent in terms of understanding and remembering them. Without enough focus on refining information it can become stagnant and irrelevant, according to the participant.

Discussion

The responses implied that Indian logic could be adapted to the changing times and the way of teaching could be modified to help the students get acquainted with them before applying them in personal and professional aspects.

A specific element that came into focus through this research is the integral role of alternative ways of thinking in Indian Logic. Critical thinking is more than a mere skill in the Indian system of logic; rather it could be considered as a way of life. The emphasis given to structured discussions of topics made sure that there could be varied contributions to the status quo of these topics being discussed, all of which had to be backed by proof. In the article ‘Nyaya (Tarka Shastra) A Short Introduction to the Hindu System of Logic and Debate’, it is mentioned briefly that Nyaya involves the analysis of the subject of knowledge through logical thinking. Thus, Nyaya

discourages beliefs that have no proof supporting it; in addition Indian Logic is characterized by constructive thinking that aims to attain a real understanding of things and critically enquire about them (Sivan, 2018) ^[16]. Critical thinking wasn't explicitly highlighted in the existing literature but they were implied to be a mechanism to check the truth or falsity of any information. One of the articles to study if the logic and critical thinking had a Western Bias, the various texts of non-western philosophy was looked into and it was said that Indian logic adopts a character view of critical thinking which means that the person possesses certain characteristics that allow him to imbibe those skills in his lifestyle (Vaidya, 2016) ^[17]. Nyaya establishes that inferences drawn are critically evaluated on the basis of methodical reasoning and systematic mechanisms before being accepted as being valid (Sarukkai, 2005) ^[14]. This critical analysis encourages students to think in different ways and through the method of finding faults in the inferences, make them more refined and precise.

The findings also indicate that study of Nyaya allowed students to attain proficiency in communication skills essential in debate. This is also supported in the existing literature, a critical review on inference as a means of knowledge highlighted similar points of inference for the sake of sharing viewpoints requires some amount prowess over communication skills and the method of Nyaya does equip people with those skills of presentation (Rajendran, 2015) ^[15]. Nyaya employs inference as a means of coming to logical conclusions; verbally explaining the inference drawn requires a capacity to convey it with precision.

One of the aspects of Logic that came into light through the research was that of logical debate in this system of Logic. Debate in Indian Logic was focussed on finding a conclusion through means of arguments and counter-arguments that was backed by proof and reason. In a research done by the Department of Computer Science and Engineering on “An Indian Logic- based Argument Representation Formalism for Knowledge Sharing” this was corroborated. In developing a mathematical model the researchers mentioned that in debate attacking arguments is mainly concerned with finding flaws in concept definition (Mahalakshmi & Geetha, 2008) ^[8]. Another thing pointed by the participants was the use of debate to derive knowledge (Vaada). This was also talked about in “Indian Logic- A Reader” whereupon the author mentioned that Vaada or honest debate was given immense importance when the purpose of debate was to derive knowledge, irrespective of who wins or loses. Thus, all information had to be backed with examples and proof.

One of the factors related to analytical thinking that was understood through the responses of the participants was that it aimed at questioning the truth or falsity of any information and accept it to be valid only after it is proven to be so. This was mentioned in two books on Indian Logic. In “Primer of Logic according to Annama Tarkasamgraha “it was mentioned that Indian Logic focusses on sources of valid knowledge and thus employs methodical reasoning of Knowledge (Vidyavacaspati & Sastri, 1951) ^[18]. Also, in “Nyaya Theory of Knowledge” the author talked about the theory of validity and invalidity in Indian Logic- every knowledge is neutral and depends on whether it can be confirmed or disproved with facts (or in its absence) (Chatterjee, 1950) ^[2]. This approach ensured that every information was objectively studied and deemed to be valid or invalid.

Some other points that came into light, through this research, were the need for bridging the gap between the existent concepts of Nyaya and bringing the concepts into academic settings. This could be achieved by modifying the approach of teaching the concepts, modifying the textbooks of Nyaya to include newer examples or ensuring that basics of the Sanskrit Language are taught to the students. This relatively new insight from the research provided a realistic view to the possibility of including concepts of Indian logic in modern academics. Also logical consideration of every information is necessary to make the pool of knowledge as sound as possible but that in no means encourages complete avoidance of emotionally driven and intuitive decisions and behaviour. A balance between logical and intuitive thinking would be the most helpful for individuals; this was something pointed out by some of the participants.

Conclusion

The major theme that emerged from the research indicates that incorporating Indian Logic in modern academia would require collaborative efforts on the part of the academicians of modern education and proponents of Indian philosophy to adapt the approach of teaching the concepts. Indian Logic encourages students to think critically and find a balance between scepticism and open-mindedness thus ensuring that knowledge is always refined and modified with changing time. Students can then become active participants in their education and learn to translate their learning in the real-life setting. The systemic factors that could be present in incorporating new concepts in education were not explored and hence it only focused on the aspects of Indian Logic itself. This area has not been researched upon as much as Indian Logic's applicability in computer science. Hence, it becomes all the more necessary that there could be a collaboration between the fields of modern academics and Indian Logic so that a balanced approach can be adopted to introduce Indian Logic in modern academics. The concepts must not be limited to the textbooks alone but could be taught with a view that they are imbibed by the individual for their development and the overall development of the education system.

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