Saarth E-Journal

Saarth
E-Journal of Research

E-mail: sarthejournal@gmail.com
www.sarthejournal.com

ISSN NO: 2395-339X
Peer Reviewed
Vol.7, Issue.4 No.24

Impact Factor: 6.89
Quarterly
Oct. to Dec. - 2022

THE BENEFITS OF CUTTING-EDGE RESEARCH IN THE CLASSROOM

***Prof. (Dr.) Vinodkumar Kantilal Satyapal**

ABSTRACT

The scientific approach of analysis is applied in a more formal, concentrated, and intensive manner in advance educational research. The primary goal of advance educational research is to apply scientific methods to the study of education in order to identify and address existing gaps in the discipline. As a field of study, advance educational research aims to compile a systematic body of scientific information pertaining to issues of interest to educators. Understanding, explaining, predicting, and (to some extent) influencing human behaviour has been the primary focus of advance educational research, which is a subfield of the behavioural sciences. Advance research in education is the application of scientific analysis techniques to the collection and interpretation of data for the purpose of advancing knowledge and practise in the fields of education (including but not limited to: planning and decision making; teaching and learning; curriculum development; understanding children and youth; the use of instructional media; school organisation and management).

(*Prof. (Dr.) Vinodkumar Kantilal Satyapal, Sabarmati University, Ahmedabad, School of Education, Email: vksatyapal@gmail.com)

The importance of advance research extends well beyond the realm of education. It cleanses the inner workings and daily lives of people. It's a quest for understanding with a primary focus on bettering quality. It illustrates how to offer answers to issues in a rational and logical fashion. This is a concerted attempt to learn something new from every possible angle. Focusing on the importance of advance research in the classroom is the primary goal of this article. The goal of advance educational research is to address any issue in the field of education. The relevance of statistical data in research, the meaning and characteristics of advance educational research, the steps of advance educational research, the forms of advance educational research, the benefits of advance educational research, the challenges of advance educational research, the implementation of advance educational research, and the ethical concerns of advance research are all major topics covered in this study.

KEY WORDS: Education, Advance Research, Characteristics, Challenges, Implementation.

INTRODUCTION

ADVANCE EDUCATION RESEARCH MEANING: Advance Educational Research is a deliberate effort to develop a better knowledge of the educational process, with the goal of increasing its efficiency. It is the use of scientific technique to the investigation of educational issues.

DEFINITIONS

- **Good:** "Advance Educational Research is the study and investigation in the field of education."
- **Munroe:** "The final purpose of advance educational research is to ascertain principles and develop procedures for use in the field of education."
- **Mulay:** "Any systematic study designed to promote the development of education as a science can be considered advance educational research."
- **Crawford:** "Advance Educational Research is a systematic and refined technique of thinking, using special tools in order to obtain a mere adequate solution of a problem."
- **J. W. Best:** "Advance Educational Research is that activity which is directed towards development of a science of behaviour in educational Situations: The ultimate aim of

such a science is to provide knowledge that will permit the educator to achieve his goals by the most effective methods."

- **W. M. Traverse:** "Advance Educational Research is that activity which is directed towards the development of science of behaviour in educational situations."

ADVANCE EDUCATIONAL RESEARCH: CHARACTERISTICS

- Advance Educational Research is aimed at solving an issue in the realm of education. It might try to answer a query or figure out the relationship between two or more variables.
- It stresses the formulation of generalisations, principles, or hypotheses that will aid in the prediction of future events.
- Typically, Advance Educational Research extends beyond the specific items, organisations, or circumstances studied to infer features of a target population from the sample seen.
- Advance Educational Research entails gathering new data from primary or first-hand sources or repurposing current data.
- Just what can be verified by observation is accepted in Advance Educational Research. Certain intriguing issues do not lend themselves to research methodologies on their own.
- Although research activity can be somewhat spontaneous and unsystematic at times, it is more generally defined by well established techniques that always include rigorous analysis. Although trial and error is frequently used, research is seldom a blind, shotgun approach to seeing what happens.
- The goal of Advance Educational Research is to be objective and rational, using every available test to confirm the techniques used, the data obtained, and the conclusions reached. The researcher makes an effort to remove personal prejudice.
- Expertise is required for Advance Educational Research. The researcher is aware of what is known about the subject and how others have examined it.
- Advance Educational Research entails the search for solutions to unsolved problems. Its purpose is to push back the boundaries of ignorance, and originality is typically a hallmark of a solid research effort.
- Insight and creativity are at the heart of Advance Educational Research. It needs the assistance of a man who sees beyond the present.

- Advance Educational Research necessitates an integrated approach. It is connected to the investigation of complicated factual relationships.
- Advance Educational Research is not as precise as physical science research. We can influence the occurrences in the latter, but not in Advance Educational Research.
- The subject of Advance Educational Research is vast. Advance Educational Research disciplines include educational psychology, educational philosophy, methodology, class organisation and administration, child development, and other subjects.

ADVANCE EDUCATIONAL RESEARCH: OBJECTIVES

- To comprehend and comprehend the significance of research in teaching.
- To comprehend the various approaches of doing research.
- To assess the impact of educational research.
- To forecast the potential benefits of including a research component into teaching.
- To assess the benefits of adopting research in the educational system.

ADVANCE EDUCATIONAL RESEARCH: NEED & IMPORTANCE

Advance Educational Research, like research in other domains, is critical for producing useful and reliable knowledge that can be used to improve the educational process. Many factors point to the importance of educational research (Best, 1998).

- Advance Education has deep origins in fields such as philosophy, history, economics, psychology, and sociology. Sound theories can only be formed by an intense process of scientific study into the philosophical, historical, economic, psychological, and social influence on many elements of education.
- Advance Education is seen as both a science and an art form. It has a body of knowledge as a science. Because advance education is based on a corpus of information, scientific knowledge must be added to it for expansion and improvement. Advance Education, as an art form, strives to effectively transfer information. For example, 'How can the educator play a productive role both within and beyond the classroom?' is a critical topic for educators. To improve teacher effectiveness, thorough research efforts are required.
- The motto of Advance education democratisation resulted in the extension of education. It has given birth to a slew of issues, such as the issue of individual variation, expansion,

buildings, discipline, and so on. Solving such challenges by using trial & error or through learning from convention and authority frequently produced incorrect results. We need research-based answers so that future generations are not at the mercy of mistakes or flagrant sins of tradition, ignorance, and prejudice (Boykin, 1972).

- Because of the evolving notion of education, there is a demand for Advance Educational Research. The International Commission on the Development of Education, in its report "Learning To Be" (UNESCO 1972, p. 143) emphasises: “Advance Education from now-on can no longer be defined in relation to a fixed content which has to be assimilated, but must be conceived of as a process in the human beings, who thereby learns to express himself, to communicate and to question the world, through his various experiences and increasingly - all the time - to fulfil himself. It has deep roots not just in economics and society, but also in psychology research discoveries that show man is an incomplete creature who can only fulfil himself via ongoing learning. If this is true, then advance education occurs at all ages, in all contexts and conditions of life. It returns to its original essence, which is to be entire and life-long, and exceeds the restrictions placed on it through the ages by institutions, programmes, and procedures.” In light of the nature of education described above, the boundaries of educational research must be expanded beyond formal and traditional forms of education to non-formal and creative systems based on ecological and cybernetic models (Bransford et al., 2017).
- Great changes have occurred during the previous two decades as a result of significant scientific and technical breakthroughs. Education must play a significant part in allowing us to embrace change with ease. It can do so through improving the existing curriculum, materials, teaching techniques & evaluation (Bulterman-Bos, 2008). Advance Educational Research has permitted significant progress in curriculum creation and reform, training slow learners, recognizing the psychological qualities of physically challenged persons and tailoring instructional approaches to the requirements of individual learners. Advance Educational Research has made a significant contribution to learning about diverse cultures, norms, and values. Individuals have made significant contributions to their knowledge and awareness through research, including recognising institutional governance & actions, collective practises, school environment, interpretation of the collected data, identity, levels of ambition, malnourishment and

racism, educational inequality, and the deprived, marginalised, and socioeconomically backward sections of society. The need for research activities that will support education in achieving its goals and objectives, rebuilding trust in public schools, adapting to cultural diversity, educating for personality and individual realisation, re-establishing faith in human, moral, and democratic values, bringing about modifications in racial attitudes, achieving quality and relevance goals, and meeting the obstacles of the futuristic society of advancing scientific and technological change, has become imperative (Boykin, 1972).

Types of Research: (Pramodini and Sophia, 2012) The following are the many sorts of research methods:

a) **Basic research:** Data collected to improve understanding is a basic research definition. The primary motivation is to increase one's knowledge. It is a non-profit study that does not aid in the creation or invention of anything. For instance, consider an experiment to discover a basic truth.

b) **Applied research:** Applied research analyses and solves real-world problems. This category includes research that uses scientific approaches to tackle practical challenges. Studies have a vital part in resolving challenges that affect human well-being: Discovering a particular cure for a sickness, for example.

c) **Problem-oriented research:** Like the name implies, issue-oriented research is carried out to determine the specific nature of a problem in order to develop applicable answers. When analysing a situation, the phrase "problem" refers to various options or difficulties.

d) **Problem-solving research:** Companies do this sort of research to understand and solve their own difficulties. To identify answers to existing issues, the problem solving technique employs applied research.

e) **Qualitative research:** Qualitative research is an inquiry-based method. It aids in the development of a thorough grasp of problems or challenges in their natural surroundings. This is a non-statistical approach (Alexander and Dochy, 1995). The expertise of the investigators and the inquiries used to explore the sample are crucial in qualitative research. Typically, the sampling size is limited to 6-10 persons. Open-ended inquiries are designed to elicit responses that flow to some other question or collection of

questions. The goal of using open-ended questions is to elicit as much information from the sample as feasible (Brownlee, 2001). The below are the qualitative research methods:

- One-to-one interview
- Focus groups
- Ethnographic research
- Content/Text Analysis
- Case study research

f) **Quantitative research:** Qualitative research is an organised method of gathering and analysing data in order to develop findings. Unlike qualitative approaches, this method collects and analyses data using a computer and statistical process. Numbers are fundamental to quantitative data. Quantitative research entails a bigger sample size; more persons equal more data. You can get more accurate findings if you have more data to analyse. Because the investigators are usually seeking for statistical data, this strategy employs closed-ended questions. In quantitative research, surveys, interviews, and polls are preferred data collecting techniques. There are several techniques for distributing surveys or questionnaires. Internet surveys enable survey authors to access vast numbers of individuals or narrower focus groups for various sorts of research with varying purposes. Respondents can get surveys through cell phone, email, or by using the internet to access the surveys (Hiebard, 1993).

RESEARCH PURPOSE

There are three goals to research:

a) Exploratory: Like the name implies, exploratory research is carried out to investigate a set of questions. The answers and analytics may not provide a conclusive solution to the apparent problem. It is carried out to address previously unexplored issue areas. This exploratory phase establishes the groundwork for more definitive study and data collecting.
b) Descriptive: Descriptive research aims to increase understanding about current situations through data collecting. Descriptive studies are employed to characterise a sample population's behaviour. Just one variable is necessary to conduct a descriptive research. The three primary goals of descriptive research are to describe, explain, and validate the

findings. For example, a research was undertaken to determine if top-level management executives in the twenty-first century have the ethical right to acquire a large quantity of money from firm profits.

c) Advance Explanatory: Advance Explanatory research, also known as causal research, is undertaken to determine the impact of modifications to current standard practises. Experimenting is the most common type of informal research. For example, consider a research undertaken to determine the impact of rebranding on consumer loyalty (Tsai, 2002).

Below is a comparison study to help you understand the characteristics of research design utilising research purpose:

	Explanatory	Descriptive	Advance Explanatory
The research method employed	Unstructured	Structured	Extremely organised
Performed research	Inquiring about research	By research Questionnaire	Utilizing research hypothesis
When it is held?	First phases of decision-making	The last steps of decision making	The last steps of decision making

The techniques or equipment utilised to fulfil the goals and qualities of a study are referred to as the research method. Consider the technique to be a methodical procedure during which the skills or equipment will be used. A tool is worthless unless it is used effectively. Asking the correct questions and selecting a suitable approach to study the topic are the first steps in research. Following the collection of responses to your inquiries, one can evaluate the results or observations to reach reasonable conclusion (Kothari, 2014). Whenever it comes to consumer and market research, the more detailed your inquiries are, the better. You may gain vital insights into brand reputation and product demands by properly gathering data from customers via surveys and questionnaires. You may utilise this information to make informed judgements regarding your marketing strategy and properly position your company.

ADVANCE EDUCATIONAL RESEARCH PROCEDURES

Advance Educational Research is the examination of educational issues through the lens of the scientific method. This means that the procedures used in educational research are essentially the same as those in the scientific method. The following is a typical breakdown of how educational research is conducted (Russell, 1962).

I. Statement of the Research Issue: Research in education must first identify an issue.

It is possible to find research challenges in the following areas:

- The obvious places to look are in classrooms, schools, homes, communities, and other organisations.
- Opportunities for study are always emerging as a result of social and technical advances.
- Previous studies' archival documentation should also be reviewed. Research encyclopaedias, doctoral theses, and other academic monographs fall under this category.
- Several interesting challenges to address will be suggested in class discussions, seminars, and exchange of ideas with the professors and fellow academics and students.
- It is also beneficial to seek the advice of a professional, supervisor, mentor, or senior academic in the field.

II. Hypothesis construction: Well constructed hypotheses should be used in advance educational studies. This might be expressed explicitly or indirectly (Wilkinson and Bhandarkar, 1979).

Hypothesis: A researcher's hypothesis is a declaration of a proposition or a plausible guess based on the available evidences that he or she intends to test in the course of their investigation.

III. The procedures should be followed: Critical to any study's success is the decision of which research approach to choose. It describes the overarching approach taken to assembling and analysing the information required to address the issue. Research strategies may be broken down into three broad types: (1) historical; (2) descriptive; and (3) experimental. The research methodologies employed are based on the specifics of the topic at hand and the information needs of the questions being asked.

IV. Taking in information: Although the research method lays out the general strategy for tackling the issue at hand, this phase focuses on the methods and techniques that will be used to actually gather the data. It involves things like choosing and creating data-gathering tools like exams, questionnaires, rating scales, interviews, observations, checklists, and the like, as well as the characteristics of the sample to be studied.

V. Information processing and interpretation: The quality of a study may be judged by how meticulously the researchers analysed and interpreted the results. It entails picking the right mix of quantitative and quantitative methods for analysing the data gathered.

VI. Results reporting: We have now reached the final and most crucial stage of our investigation. Well crafted deductions, conclusions, or generalisations are its defining feature. As a result, the researcher must be able to convey his methods, results, and conclusions to anybody who could be interested in his work with complete objectivity.

Researching in the field of education has a number of difficulties. The following have been cited as some of the difficulties associated with educational research: (Pramodini & Sophia, 2012). While theory, thinking, philosophy, appropriateness, and prejudice are all potential pitfalls, research and evidence are essential for informing the teaching and learning process. Equal opportunity, equality of treatment, and other forms of social justice should be the driving forces behind educational research. Political ideology carries with it inherent risks and instability. In addition to helping students succeed academically, we also provide them with opportunities to build their own abilities and advance in their studies. Students are the country's future, and if they are properly educated and given opportunities to hone their abilities, they will be able to make significant contributions to their local communities and the country as a whole. Teachers have a moral obligation to help shape their students into productive members of society by arming them with useful information and skills. The educator must play a pivotal role in raising students' levels of self-awareness. Taking the philosophical approach narrows one's options, which is counterproductive to education's true goal (Ghosh, 1982).

What has been taught from a bygone era, new theories and technical developments have occurred and are occurring. When educators rely entirely on their own anecdotal knowledge without engaging in reflective practise, education is at risk of becoming antiquated, invalid, and un-progressive. There is no way for a single hypothesis to operate independently. Learners and

learning are nuanced, and their effectiveness depends on a wide range of personal, ages, genders, locations, ethnicities, religions, educational levels, personalities, occupations, and more. In order for researchers to adapt their work to their own local and personal contexts, it is essential that they discuss, test, and critique their hypotheses with others. Adaptability and controllability are crucial. To be effective in the classroom, teachers must manage their students' mental processes, attitudes, and behaviours. Students are expected to fully understand and implement the research methods they have been taught.

It's important to establish efficient teaching-learning procedures and make sure students have gained efficient comprehension since learning new ideas and new ways of acting can be difficult, especially at the beginning. Just building a foundation for education on the idea that it should be easy to absorb information is not sufficient. Individuals have benefited from research because it explains and validates their decisions and actions, helps them prepare for the unexpected, enables them to spot difficulties, acquires sufficient information, and improves their chances of success in general.

RESEARCH-BASED INSTRUCTION: PUTTING NEW UNDERSTANDINGS INTO PRACTICE

These are some of the suggested methods for incorporating research into classroom practise: (Pramodini & Sophia, 2012). It is important that different types of research are acceptable to those who develop, plan, and carry out policies. Educational achievements can be linked to societal and economic needs thanks to large-scale studies of student performance that have helped to reveal patterns. The decision-makers need to see the whole picture. Nevertheless, researchers are curious in why some methods succeed while others fail to be of use to practitioners. Research ethics provide a proclamation that all professionals need to have trust in the reliability of their sources of knowledge. In order to do their jobs properly, professionals need access to many kinds of data and proof. Researchers need to be well-informed and well-versed in many different areas. The research process consists of four main steps: gathering information, arranging that information, analysing that information, and drawing conclusions from the analysis.

Educating does not need original thought or risk-taking. It is crucial to implement the necessary approaches and tactics within the teaching processes in order to ensure the success of the teaching-learning processes. Educators and researchers must know which methods are effective and why. The tactics should constantly be made use of that creates productive outcomes (John and James, 1986). Generally speaking, research is most useful in academia, and especially so for those writing theses at the master's or doctoral level. From basic to applied to actionable to qualitative and quantitative, research comes in many flavours. Unlike quantitative research, qualitative research is conducted via conversations and not numbers. Quantitative research, in contrast, relies on numerical data gleaned mostly from surveys. People should have a solid background in these methods of inquiry and be able to articulate their reasoning and experience in detail. The more formal tone of the writing will indicate the confidence with which the author believes that the action taken by the instructor will result in improved student performance, motivation, commitment, and behaviour.

RESEARCH ETHICAL CONSIDERATIONS

It is crucial to keep in mind ethical concerns when you do your study. There is an established code of conduct that the researchers must follow. The following are the ethical factors to be taken into account:

- In the instance of sponsored research, where the sponsoring agency has supplied the researcher with financial help, the researcher may be subject to certain obligations from the client. The researcher owes duties to the study's participants, the greater community, the study's topics (including the study's sample and responses), and the researcher's professional peers. No information that might be used to draw inferences or draw wrong conclusions for the sponsoring entity should be eliminated.
- Research participants should feel confidence that their information will be kept private. Without the approval of the respondents, no information about their personal data shall be made public in any of the records, reports, or to any other persons.
- Without the consent of the subject, the researcher must not employ covert methods such as concealed cameras, microphones, tape recorders, or observers. Similarly, personal correspondence should not be shared without the permission of the individuals involved.

- When using human volunteers as subjects in an experiment, researchers have a responsibility to ensure their safety and comfort by providing them with detailed information about the study's design, duration, potential risks, and any special requirements they may have to meet (such as staying back an extra hour after school).
- Subjects should be given some background on the study or experiment if at all feasible. If you're working with pupils who are too young to provide their own consent or who have mental disabilities, you must first get their parents' permission. Informed consent describes this state of affairs.
- The researcher has to recognise that the participants have the option to leave the study at any time. Refusals and unfavourable replies are typical during field trips; as a result, researchers must be well prepared to deal with them.
- There should be no extra effort made by the researcher to provide encouraging treatment to the participants after the data has been obtained in order to secure the subjects' participation and continuation in the experiment. You may be putting in more time, energy, money, etc., if you want to improve your grades or other outcomes.
- Researchers have an ethical obligation to keep their test subjects safe from emotional and physical distress, danger, risk, stress, worry, and pressure during experiments that may have long-lasting effects on their lives.
- The data should be shared with other researchers for verification. Sometimes, those who are being studied may wonder why researchers are interviewing them. One possible question is why this study is being conducted.
- Before interviewing or otherwise collecting information from participants, researchers should explain the study's rationale and the participants' roles in it. This is necessary for the experimentation and, if necessary, the results of the investigation.
- All people who helped in any way with the research study, development of tools, gathering of data, analysis of data, or writing of the report should be acknowledged. Researchers should express their appreciation to these people, especially the supervisors who oversaw the project's execution.
- Researchers have a responsibility to reassure participants that their answers will be treated as confidential. There will be no disclosure of any individual details other than

those contained in the aggregate statistics. Respondents may be hesitant to share their opinions since doing so would involve disclosing personal information.

- They often ask for a letter from the researcher's home university or research group. People are more likely to accept to participate in a study if they have learned more about the researchers conducting it and the goals of the investigation.

CONCLUSION

In light of the fact that the existing educational system is in dire need of reform, this article is an effort to raise awareness of the significance of research across all areas of advance education. Many changes will be made to the current curriculum as a result of the adoption and implementation of research-based education in primary and secondary schools, colleges, technical educational institutions like engineering, polytechnics, and medical education institutions. This is because research-based advance education places an emphasis on leading the educational programme towards attaining the necessary success, innovation, quality enhancement, and emphases on preparing students for the workforce. Educating students with empirical findings fosters creative approaches to learning. It is safe to say that the student body as a whole and society as a whole will gain from the adoption of research-based pedagogy. Institutions of higher learning place a strong emphasis on research because of its importance. Students writing theses for advanced degrees typically investigate a wide range of topics. Effective research requires persons to be well-versed in a set of methodical techniques and procedures. Teaching and learning processes, instructional strategies, classroom environment, academic subjects, student academic performance, teacher academic aptitude and proficiency, performance evaluation methods, extracurricular activities, creative activities, socialisation, anxiety and pressure concerning examinations, and so on are just some of the topics that have been the subject of educational research. There are many different kinds of studies that can be conducted, including basic studies, applied studies, action studies, quantitative studies, and qualitative studies.

Formulating the research topic, establishing objectives, gathering data, putting hypotheses to the test, analysing the results, and drawing conclusions are the primary steps in every research project. Knowledge of SPSS, in particular, is required to carry out these procedures successfully. It is not just college professors who do research in the classroom;

educators at all levels of advance education contribute to the body of knowledge. Readings, papers, journals, and the World Wide Web all play a role in this endeavour. As a result, people are better informed and have access to more resources. Research in the field necessitates going out and observing things for oneself. When doing this kind of research, academics often go to other locations, such as educational institutions, training centres, and other similar facilities, in order to amass the necessary information.

REFERENCES

Alexander, P.A. & Dochy, F.J.R.C. (1995). Conceptions of knowledge and beliefs: A comparison across various cultural and educational communities. American Educational Research Journal, 32, 413-442.

B.N. Ghosh (1982) "*Scientific Methods and Social Research*", Sterling Publishing.

Best, J.W., & Kahn, J.V. (1998). Research in Education. Retrieved February 18, 2023 from http://ww2.odu.edu/~jritz/attachments/reined.pdf

Boykin, L. (1972). Why Research in Education? Retrieved February 18, 2023 from http://www.ascd.org/ASCD/pdf/journals/edlead/el_197204_boykin.pdf

Bransford, J.D., Vye, N.J., Stipek, D.J., Gomez, L.M., & Lam, D. (2017). Equity, Excellence, Elephants and Evidence. Retrieved February 18, 2023 from http://hepg.org/HEPG/Media/Documents/intro_role-of-research-in-ed-improvement-4.pdf

Brownlee, J. (2001). Knowing and learning in teacher education: A theoretical framework of core and peripheral epistemological beliefs. Asia-Pacific Journal of Teacher Education and Development 4(1), 131-155.

Bulterman-Bos, J.A. (2008). Will a Clinical Approach Make Education Research More Relevant for Practice? *Relevance in Education Research, 37(7),* 412-420.

C.R. Kothari (2014). "*Research Methodology, Methods and Techniques*", 2nd Edition, New Age International Publishers.

Hiebert, J., Gallimore, R. & Stigler, J. (1992). A knowledge base for the teaching profession: What would it look like and how can we get one? Educational Researcher, 31(5), 3 – 15.

John W. Best and James V. Kahn (1986). "*Research in Education*", 5th Edition, Prentice-Hall.

Kliebard, H. (1993). What is a knowledge base, and who would use it if we had one? Review of Educational Research 63, 295 - 303.

Pramodini, D.V., & Sophia, K.A. (2012). Evaluation of Importance of Research Education. *International Journal of Social Science & Interdisciplinary Research, 1(9),* 1-6.

Russell L. Ackoff (1962). "*Scientific Method Optimizing Applied Research Decisions*", John Wiley and Sons.

T.S. Wilkinson and P.L. Bhandarkar (1979). "*Methodology and Techniques of Social Research*", Himalaya Publishing House.

Tsai, C. (2002). Nested epistemologies: Science teachers' beliefs of teaching, learning and science. International Journal of Science Education 24(8), 771-783.