An Analysis of Research Methodology Related in Relation and their Teaching Competence of Senior Secondary School Teacher

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Abstract:
Research methodology is the backbone of any systematic investigation that aims to enhance educational practices. In the context of teaching, it provides a structured approach to understanding, analyzing, and improving instructional competence. This paper examines the relationship between research methodology and the teaching competence of senior secondary school teachers. The study highlights how a sound understanding of research methods enables teachers to apply evidence-based strategies, evaluate classroom practices, and engage in continuous professional growth. Using a descriptive and analytical approach, the paper reviews existing literature and explores how familiarity with research principles contributes to teachers' planning, evaluation, innovation, and reflective practices. Findings indicate that teachers with greater research orientation demonstrate improved classroom performance, better decision-making, and more effective instructional delivery. The study emphasizes the need for integrating research methodology training into teacher education programs to foster a culture of inquiry and innovation in schools.

Keywords: *Research Methodology, Teaching Competence, Pedagogical Skills, Senior Secondary Teachers, Educational Research, Teacher Effectiveness, Instructional Strategies, Professional Development*

1. Introduction
Education in the 21st century requires teachers to be not only subject experts but also reflective practitioners capable of analyzing and improving their teaching through research. **Research methodology** serves as a scientific framework that helps educators investigate educational problems, assess teaching outcomes, and apply findings to enhance classroom effectiveness. For senior secondary school teachers—who play a crucial role in shaping students' academic and professional futures—research-based thinking is indispensable.

Teaching competence encompasses a teacher's ability to plan lessons effectively, use appropriate teaching-learning strategies, assess student performance, and maintain a positive classroom environment. A teacher well-versed in research methodology can analyze learner needs, experiment with new pedagogical techniques, and adopt evidence-based approaches to improve learning outcomes.

Several scholars (Best & Kahn, 2006; Cohen, Manion & Morrison, 2018) have emphasized that research-oriented teachers exhibit greater professional competence, adaptability, and reflective awareness. In India,

the National Education Policy (NEP) 2020 also underscores the importance of integrating research and innovation in teacher education programs to ensure continuous professional development.

Therefore, this paper seeks to analyze the relationship between research methodology and teaching competence among senior secondary school teachers. It aims to identify how research awareness, skills, and application influence teachers' effectiveness in planning, instruction, and assessment, thereby contributing to educational quality improvement.

Detailed description of soft skills, teaching competence, emotional maturity, and organizational climate and their need and importance in education, have been discussed in detail. On the basis of these discussions and a comprehensive literature of review of related variables, this chapter details the methodology employed to conduct the present study.

2. Research Methodology

The aim of this research is to find out the solution of selected problem by the application of scientific method. The main motive of this study is to drawn the conclusions of truth that is invisible and which has not been searched yet. Research is to result in something new, new knowledge, or fresh application to the knowledge that we have discovered in earlier researches, or a new interpretation, new and more correct way of explaining a method or even a new finding to a question.

"Research is considered to be more formal, systematic and extensive process of carrying on a scientific method of analysis. It involves more systematic structure of investigation usually resulting in some sort of formal record of procedures and a report of results or conclusions" (Best & Kahn, 1992). The method of research work depends upon the research problem, objectives and hypotheses. Best (2010), described Research Methodology as "What must be done, how it will be needed, what data gathering will be employed, how sources of data will be selected and how the data will be analyzed and conclusions reached".

In the current research the investigator investigated about soft skills, teaching competence, emotional maturity of senior secondary school teachers, and organizational climate of senior secondary schools by applying the survey method of research. About the survey method Mouly (1970) states "No category of educational research is more widely used than the type known variously as the survey, the normative-survey, status, and descriptive research."

2.1 Population of the study

Total teachers, teaching in Senior Secondary Schools (Class 11th and 12th) in Meerut district, U.P., consist of the population of the current research. First of all, the list of Senior Secondary Schools situated in the Meerut district of U.P. was collected from the office of District Inspector of Schools, Meerut. It was observed that there are 587 teachers teaching in 86 senior secondary schools in Meerut district, U.P.

2.2 Determination of Sample Size

To decide an appropriate sample size, first of all researcher calculate a minimum sample size using the following sampling formula proposed by Yamane (1967)-

$n = N/[1+N(e)2]$

$= 587/[1+587(0.05)2]$

$=237.89$ or 238

n = required sample size(minimum)

N = population size

e = error (which was decided at .05 level)

With the estimated population size of 587, the minimum sample size came out to be 238. To made sample more representation of the universe, the researcher decided to take a sample size of 300 senior secondary school teachers which were further divided by 6.82(587/86=6.82) to get the number of colleges to be contacted. This was done because the population consisted of 587 teachers and the number of senior secondary schools were 86. Thus, it was decided to select 44(300/6.82= 43.98) senior secondary schools to get an appropriate sample of teachers teaching in these schools.

2.3 Sampling Technique and Selected Sample

First of all, the researcher used a simple random sampling method (lottery method) to select 44 senior secondary schools from the list of 86 senior secondary schools situated in Meerut district, U.P. Considering that there is a huge difference between the number of teachers teaching in each senior secondary school, cluster sampling technique was found most appropriate for selection of a representative sample of senior secondary school teachers. These 44 senior secondary schools were taken as whole. Researcher found total 315 teachers teaching in these 44 senior secondary schools. Out of these 315 senior secondary school teachers, 300 teachers filled all the tools completely. So final sample of the research consists 300 senior secondary school teachers. Out of these 300 senior secondary school teachers, 126 are male and 174 are female teachers. The details of selected 44 senior secondary schools with the no. of teachers are given in Table 1.

Table 1: Number of Teachers selected from Senior Secondary Schools

Sr.	School's Name	Total No. of Teachers	No. of Teachers participated in present study	Male Teachers	Female Teachers
1	Durga Bari A B Girls Inter College, Sadar, Meerut	07	06	-	06
2	Faiz-E-Am Inter College, Delhi Road Meerut	12	10	06	04
3	Gurunanak Girls Inter College, Kanker Khera, Meerut	10	09	-	09
4	Howard Plested Girls Inter College, Civil Lines, Meerut	06	05	-	05
5	Ismail Girls National Inter College, L-Block Shastri Nagar, Meerut	08	07	-	07
6	Ismail Girls National Inter College, Old Tehsil Subhash Bazar, Meerut	10	09	-	09
7	Jagdish Sharan Rajwanshi Girls Inter College, Begum Bridge, Meerut	10	08	-	08
8	Janta Inter College, Kharkhauda, Meerut	12	10	06	04
9	K. K. Inter College, Delhi Road, Meerut	13	12	07	05
10	N. A. S. Inter College, Ek Road Meerut	17	15	12	03
11	Nav Bharat Vidyapeeth Inter College, Partapur, Meerut	05	05	03	02
12	R. G. Inter College, Chippi Tank Meerut	19	17	07	10
13	Ram Sahai Inter College, Garh Road	04	04	01	03

Aparana Kabiraj et al. [Sub.: Education] [I.F. 5.761] International Journal of Research in Humanities & Soc. Sciences

Vol. 7, Issue:2, February: 2019
ISSN:(P) 2347-5404 ISSN:(O)2320 771X

	Meerut				
14	S. D. Inter College, Sadar, Meerut	06	05	02	03
15	S. D. Inter College Kanker Khera, Meerut	04	04	02	02
16	S. S. D. Boys Inter College, Lal Kurti, Meerut	13	11	08	03
17	S. S. D. Girls Inter College, Budhana Gate, Meerut	05	04	-	04
18	Sanatan Dharm Kanya Inter College, Sadar, Meerut	04	04	-	04
19	Sardar Patel Inter College, Delhi Gate, Meerut	05	04	01	03
20	Seth B. K. Maheshwari Girls Inter College, Sarai Lal Das, Meerut	05	05	-	05
21	Shanta Smarak Kanya Inter College, Kailashpuri, Meerut	07	06	-	06
22	Shri Mahaveer Shiksha Sadan Inter College, Jain Nagar, Meerut	05	04	-	04
23	Shri Sanatan Dharam Balika Inter College, Lal Kurti, Meerut	06	05	-	05
24	St. Joseph's Inter College, Meerut Cantt	08	08	06	02
25	St. Thomas Girls Inter College Mission Compound, Thapar Nagar, Meerut	07	05	-	05
26	Trisla Devi Kanohar Lal Balika Inter College, Sharda Raod Brahmapuri, Meerut	04	04	01	03
27	Gurukul Sarvodaya Inter College, Panchali Khurd, Meerut	07	05	03	02
28	Arya Vedic Inter College, Kalanjari, Meerut	04	04	-	04
29	Janta Inter College, Gejha, Meerut	03	03	02	01
30	Janta Inter College, Kalyanpur, Meerut	04	03	01	02
31	Nehru Smarak Inter College, Kurali, Meerut	04	03	02	01
32	Sarva Hitkari Inter College, Kina Nagar, Meerut	04	04	03	01
33	C. L. M. Inter College, Jani, Meerut	10	09	05	04
34	Navjeevan Inter College, Kastala Shamsher Nagar, Meerut	04	04	03	01
35	St. Charles Inter College, Sardhana, Meerut	12	11	06	05
36	Adarsh Janta Inter College, Kapsad, Meerut	04	04	02	02
37	Ch. Basheer Khan Inter College, Harra, Meerut	08	06	03	03
38	Acharya Nami Sagar Jain Inter College,	10	09	05	04

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Vol. 7, Issue:2, February: 2019
ISSN:(P) 2347-5404 ISSN:(O)2320 771X

	Sardhana, Meerut				
39	Salawa Inter College, Salawa, Meerut	06	05	03	02
40	Shri Gandhi Inter College, Dabthua, Meerut	07	05	02	03
41	Rashtriya Inter College, Lawar, Meerut	11	09	05	04
42	Gandhi Smarak Devnagri Inter College, Parikshit Garh, Meerut	13	11	07	04
43	J. N. M. Inter College, Rachhoti, Meerut	05	04	02	02
44	Ch. Premnath Singh K. V. Inter College, Machhara, Meerut	18	15	10	05
	Total		**300**	**126**	**174**

2.4 Structure of the Selected Sample

A representative sample of 300 teachers teaching in senior secondary schools was drawn through the above-mentioned process. Further, the selected sample was organized according to the gender and stream, which made the structure of the sample clear as is shown below in Figure 1.
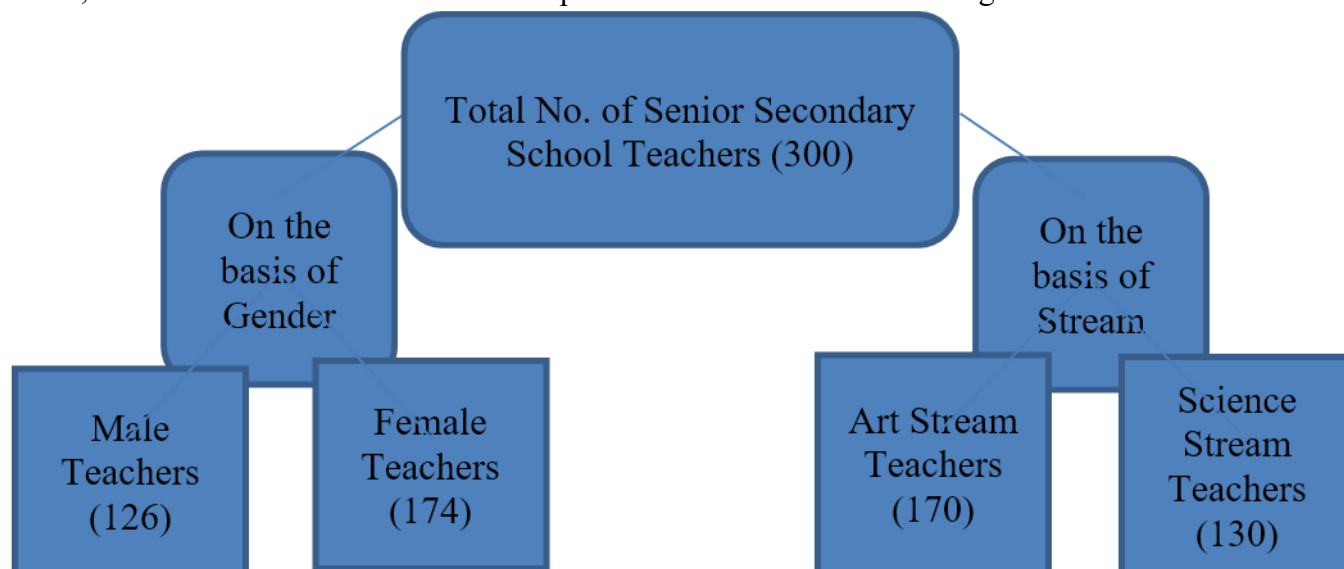

Figure 1: Structure of the selected sample

3. Conclusion

The present analysis concludes that **a strong understanding of research methodology significantly enhances the teaching competence of senior secondary school teachers.** Teachers who engage in research-oriented practices are better equipped to design effective lesson plans, assess student learning systematically, and adopt innovative teaching strategies. Research awareness fosters reflective thinking, helping teachers identify classroom challenges, test new methods, and make informed pedagogical decisions.

The study further emphasizes that professional teacher education and training programs should integrate **research methodology as a core component** to promote inquiry-based teaching and lifelong learning. Developing research competence among teachers not only improves classroom effectiveness but also contributes to the broader goals of educational reform and innovation.

In conclusion, the interrelation between research methodology and teaching competence highlights the need for continuous professional growth, where teachers evolve from information transmitters to researchers, innovators, and facilitators of learning. By nurturing research-minded educators, schools can ensure sustained improvement in the quality and effectiveness of secondary education.

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