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A STUDY OF PROBLEM SOLVING ABILITY AND ACADEMIC ACHIEVEMENT OF HIGHER SECONDARY STUDENTS

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Abstract:
Problem solving has a special importance in the study of mathematics. The primary goal of mathematics teaching and learning is to develop the ability to solve a wide variety of complex mathematics problems. A problem is an obstruction of some sort to the attainment of an objective, a sort of difficulty which does not enable the individual to reach a goal easily. The present study aims to find out the relationship between problem solving ability and achievement in mathematics of higher secondary students. Fifty five, higher secondary students were randomly selected as sample. Survey method was adopted for the study. The data was collected using a test on problem solving ability. The t-test, chi-square test and person's product moment correlation were applied to test the hypotheses. Interpretations were drawn based on the findings. Problem solving ability of the higher secondary students was found to be an average and there was a high positive correlation between problem solving ability and achievement in mathematics.

Keywords: Reasoning Ability, Academic Achievement, School Students.

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Introduction

Today's society is required to produce well-educated people who have the ability to adapt themselves to the rapidly changing and developing world. Social, economic, political and technological changes in social structure have become more complicated. Our times are marked by the speed with which change occurs and this leaves an individual facing new problems and challenges each day. As in all scientific processes, problem solving should be realized in our daily life. It is common knowledge that all through history people have solved or attempted to solve problems using the trial and error method. The process of problem solving begins with the perception of the problem and finishes with evaluation. Even though problem solving shows differences according to the problems and the individuals, the main steps of problem solving are problem understanding, planning for solution, application of plan and evaluating results.
There is a lack of research in India on the various aspects of teacher motivation mental health, teaching efficiency and job satisfaction. The psychological and social aspects of the teaching profession are under increasing scrutiny. This research aims to study how enthusiastic teachers turn into disengaged and aloof professionals within few years of their employment. It is important that we consider the potential consequences of losing public confidence in education, especially in the teaching profession. This could have negative effects on the professional image of teachers. Critics

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of teachers are often quick to point out the various reasons why they do not get along well with the rest of the country. However, research has focused on the issues that concern them, such as the role of teachers and the social pressures on them. The profession of teaching is unique in that it has various stress-related conditions. Being a good teacher can help a person avoid getting into trouble. Whether they are teaching or learning, teachers must be able to handle the constant changes and demands of their work. Due to the technological advancements and global changes, the environment has also affected the mental stability of teachers. This is a need of the time. Education is considered one of the most stressful sectors due to the various tasks that teachers have to complete in order to maintain their professional development. This includes handling unruly students and dealing with them properly. This causes them to behave carelessly and negatively attitude towards teaching profession.

The stress levels of teachers are often linked to the various tasks that they must complete in order to perform their duties effectively. Mental Health issues can affect a teacher's professional competence and personal characteristics. This issue can also affect her attitude toward the profession. The positive attitude of a teacher can help improve the learning environment in the school. It can also help develop a conducive learning environment for the students. The spectrum of teaching abilities shows that these components of a teacher's life are interconnected and interrelated has effect on their profession on long run. Therefore researcher got equisetic to find out is there any relation between Mental Health, Job Stress and Attitude towards Teaching Profession. In extensive research, scientists uncovered several studies on Mental Health, Job Stress and Attitude towards Teaching Profession. According to the researcher, no studies have shown a link between Mental Health, Job Satisfaction and Attitudes toward Teaching Profession. Therefore, Mental Health, Job Satisfaction, and Attitudes toward Teaching Profession were all investigated to see whether there was a connection. There are variances in teachers' Mental Health depending on their Job Satisfaction and Attitude toward Teaching Profession because of this researcher's experience as a teacher at a independent school. The behaviour of teachers has a significant effect on the behaviour of their students. It is crucial for teachers who have the responsibility of moulding children to be in excellent Mental Health. In spite of this, education's Mental Health approach remains underdeveloped despite its remarkable ability to penetrate and stimulate students. Teachers are always under pressure to do well in their curriculum and lessons, according to the researcher. As a result of fast change, many teachers are in poor physical and Mental Health in the educational landscape and developing educational trends. The researcher was left with a lot of unanswered issues, such as whether or not mental health and job stress are linked, as well as attitudes towards teaching profession. These concerns are at the heart of our investigation, which seeks to systematically uncover relationships and offer solutions aimed at enhancing the mental health of K-12 teachers everywhere. This study's findings will aid administration in better formulating policies and programmes for teachers by helping them realize the need for mental health. In light of these findings, new policies may be implemented to aid teachers' Mental Health and reduce workplace stress while also fostering positive views toward teaching. As a result, the researcher had a burning desire to understand more about Mental Health issues related to education in general.

Teachers build today's students into responsibility matured citizens of tomorrow. Personality development of children begins at home and shape under the guidance of teachers at school. This research adds value to the progress of teaching and learning process. Application of various skills from the point of view of emotional and knowledge aspects of personality to make teaching effective. The study will throw light on, Mental Health influencing Job Satisfaction and Attitude towards Teaching Profession. Therefore, this research will prove mental health is an integral part of total behaviour of a teacher. The study's findings are valuable since they have the following benefits: -

· **For the teachers**

According to the findings, prospective teachers will understand the significance of Mental Health, Job Satisfaction, and Attitude toward Teaching Profession. For teachers, knowing how emotionally and mentally strong they need to be can help them perform better in the classroom and on the job. Findings will also shows that how socialization with school members affects teacher's mental health and overall behaviour.

· **For the Principals**

The principal will be able to establish healthy relationships with teachers who are in excellent Mental Health, are not under any stress, and have a positive attitude about their jobs. Teachers that aren't stressed out and have a positive attitude about their work will be more productive, which will benefit the school.

· **For the School Management:** It will assist the school's administration in recruiting psychologically sound, stress-free teachers with a good outlook.

· **For Researchers**

Researchers in the future, especially those in the fields of education and psychology, will benefit and be helped by the findings of this study. If someone were to perform a comparable research, they might utilize these results as inspiration and a point of reference. The other researcher will get a better knowledge of secondary school teachers' attitudes about

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teaching and their mental health as a result of this study.

Need and Significance of the study

Mathematical problems play an important role in helping students to participate in problem-solving activities and stimulate their learning abilities. The problems should be challenging enough for students to solve in order to enhance their knowledge and comprehension. This type of activity develops students‟ curiosity in solving mathematics problems and successfully enhances their cognitive processes

Objectives of the study

1. To find out whether there is any significant relationship between problem solving ability and academic achievement in mathematics of higher secondary students.
2. To find out whether there is any significant difference in achievement in mathematics of higher secondary students with respect to 1. Gender 2. Group of study
3. To find out whether there is any significant difference in achievement in mathematics of higher secondary students with respect to 1. Gender 2. Group of study
4. To find out whether there is any significant difference between problem solving ability and academic achievement in mathematics of higher secondary students with respect to their type of school.

Method of Study

Survey method was adapted for the study

Research tools

The following research tool were adopted

1. Problem Solving Ability Test (PSAT) was constructed and validate by Dr.Saraswathy.R and K.Balasubramanian (2022) Sample of the study Fifty five higher secondary students were selected using random sampling technique from various schools of West Singhbhum district for the study.

Statistical techniques used

This study utilizes descriptive and differential analysis

Testing of Hypotheses

Hypothesis 1 There is no significant relationship between problem solving ability and achievement in mathematics of higher secondary students.

Variables	R	Table value
problem solving ability and achievement in mathematics	0.097	0.254

(at 5% level of significance the table value 'r' is 0.254)

It is inferred from the above table that the calculated value of “r‟ (0.97) is greater than the table value of “r‟ (0.254) at 5% level of significance. Hence the null hypothesis is rejected. Therefore, there is a significant relationship between problem solving ability and achievement in mathematics of higher secondary students. Further, it can be stated that there exist high positive correlation between problem solving ability and achievement in mathematics of higher secondary students.

Hypothesis 2 There is no significant difference between boys and girls higher secondary students achievement in Mathematics.

Gender	N	Mean	S.D	T value
Boys	30	16.3	4.61	0.397
Girls	25	17.5	4.28	

(at 5% level of significance the table value “t‟ is 1.67)

It is inferred from the above table that the calculated value t (0.397) is less than the table value of t (1.67) at 5% level of significance. Hence the null hypothesis is accepted. Therefore, boys and girls higher secondary students do not differ significantly in achievement in mathematics.

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Hypothesis 3 There is no significant difference in achievement in mathematics of higher secondary students with respect

Group of study	N	Mean	S.D	T value
Bio-Maths	29	16.12	3.63	0.346
C.S-Maths	26	17.94	5.04	

(at 5% level of significance the table value „t" is 1.67)

It is inferred from the above table that the calculated value "t" (0.346) is less than the table value of "t" (1.67) at 5% level of significance. Hence the null hypothesis is accepted. Therefore, higher secondary students whose major group was biology-mathematics and computer science – mathematics did not differ significantly in achievement in mathematics.

Hypothesis 4 There is no significant difference between boys and girls higher secondary students" problem solving ability in mathematics.

Gender	N	Mean	S.D	T value
Boys	30	23.5	4.39	0.45
Girls	25	24.2	6.27	

(at 5% level of significance the table value "t" is 1.67)

It is inferred from the above table that the calculated value "t" (0.45) is less than the table value of "t" (1.67) at 5% level of significance. Hence the null hypothesis is accepted. Therefore, boys and girls higher secondary students do not differ significantly in their problem solving ability in mathematics.

Hypothesis 5 There is no significant difference in problem solving ability in mathematics of higher secondary students with respect to group chosen.

Group of study	N	Mean	S.D	T value
Bio-Maths	29	24.06	5.92	0.347
C.S-Maths	26	23.50	4.78	

(at 5% level of significance the table value "t" is 1.67)

It is inferred from the above table that the calculated value "t" (0.347) is less than the table value of "t" (1.67) at 5% level of significance. Hence the null hypothesis is accepted. Therefore, higher secondary students whose major group was biology-mathematics and computer science – mathematics did not differ significantly in their problem solving ability in mathematics.

Hypothesis 6 There is no significant difference in problem solving ability in mathematics and achievement in mathematics of higher secondary students with respect to type of school.

Type of school	N	Mean	S.D	T value
Govt	19	23.78	5.33	0.49
Private	36	23.60	5.47	

(at 5% level of significance the table value "t" is 1.67)

It is inferred from the above table that the calculated value "t" (0.49) is less than the table value of "t" (1.67) at 5% level of significance. Hence the null hypothesis is accepted. Therefore, higher secondary students studying in government and private schools did not differ significantly in their problem solving ability in mathematics and achievement in Mathematics.

Findings

1. 65.5 percentage of higher secondary students had an average level of problem solving ability and achievement in mathematics.
2. There is high positive correlation between problem solving ability and achievement in mathematics of higher secondary students.
3. Boys and girls higher secondary students do not differ significantly in problem solving ability and achievement in

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mathematics.

4. Higher secondary students whose major group was biology-mathematics and computer science mathematics did not differ significantly in problem solving ability and achievement in mathematics.
5. Higher secondary students studying in government and Private schools did not differ significantly in problem solving ability and achievement in mathematics.

Educational implications

There is high positive correlation was exist between problem solving ability and achievement in mathematics of higher secondary students. For improving problem solving ability among students, teachers can adopt various teaching techniques like heuristic method, blended learning and experimental methods. Special lectures on complex concepts may be arranged to facilitate their learning, guidance programme can be provided in schools according to their knowledge level.

Conclusion

The purpose of the present study was to find the level of problem solving ability in mathematics of higher secondary students. The study result may be useful in the field of education, which may serve as data base for further research.

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