

A Study on the Impact of Mathematics Workshop on Mathematics Learning of Student- Teachers

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Abstract:

Education intends to bring behaviour changes in the students by providing manifold experience to them to become competent in the society. One such experience which the present teachers with all congenial environments choose is the Workshop. Mathematics is one of the subjects which student feel difficult to understand the concepts with clarity. Hence, mathematics teachers adopt workshop as one of the teaching strategies to make their students to understand and develop passion towards mathematics career. This study aimed to know the impact of such mathematics workshop organised in a B.Ed. college upon the mathematics learning of science student teachers. After the exposure to the mathematics workshop, the Researchers conducted a test using Google Form, which included 20 MCQ's. The questionnaire even collected demographic information such as gender, pedagogy subjects, locality and residential status of the participants. Thus, obtained data was quantitatively analysed by calculating the mean, standard deviation, and using the t-test. The findings revealed that the impact of mathematics workshop is not influenced by the demographic and academic groups.

Keywords: Mathematics Teachers, Workshop, Student Teachers, Mathematics Career, B.Ed. College, Demographic and Academic Groups.

INTRODUCTION

Learning of mathematics among B.Ed. students influences not only content knowledge but also the pedagogical understanding, and attitude towards the subject. Studies in teacher education highlight that many student-teachers enter B.Ed. programmes with gaps in conceptual clarity and fear of mathematics. Professional development activities such as mathematics workshops play a crucial role in addressing these challenges. Workshop at B.Ed. colleges plays an important role in developing professional ethics and professional competencies among student teachers. It equips them with the new skill and to combat the difficulties in teaching with confidence. The intensive session of workshop aims at providing hands on experience to student teachers, to collaborate with their better learning, to nurture critical thinking and to foster innovativeness in the students. Hence organising workshop even in the pedagogy subjects have immense benefit to the student teachers which prepares them to attend teaching practice and internship program more effectively.

OBJECTIVES

1. To study the impact of Mathematics Workshop on student-teachers.
2. To suggest policy makers, implement the findings of the result.

NEED OF STUDY

As many of the science student teachers struggle to understand the mathematics concepts, a Mathematics Workshop was conducting for them in the college. But when it is taught by conducting simple activities, they understand the same concepts easily. Since the students have misconception about learning mathematics that "learning mathematics is like climbing a mountain" this has to be erased from the minds of the students. Hence the conduct of the mathematics workshop in researcher college had a great impact upon the knowledge and understanding of core concepts and to improve teaching of those mathematics concepts.

Hence the conduct of mathematics workshop opened a door to the student teachers to view the mathematical concepts and to teach those concepts in a different and simple manner. So that it eases their job of teaching even the poorest of poor learner in the class. hence the researcher felt the need to know the true impact of mathematics workshop upon the student teachers who participated in the workshop.

LITERATURE REVIEW

According to Joyce and Weil (2017), workshop-based approaches encourage active participation and support the development of higher-order thinking skills. In teacher education programmes, mathematics workshops help to bridge the gap between theoretical knowledge and classroom application by emphasizing hands-on activities, problem solving, and pedagogical discussions.

NCERT (2019) emphasized that workshops promote constructivist learning and help student-teachers to develop innovative instructional strategies.

An investigation by Kulshreshtha and Sharma (2016) revealed that B.Ed. student-teachers who participated in mathematics workshops showed significantly higher achievement and improved teaching skills compared to those exposed to traditional methods. Similarly, Reddy and Rao (2018) found that workshop-based training enhanced problem-solving ability and pedagogical competence among pre-service teachers.

A study by Kaur (2020) revealed that mathematics workshops reduced mathematics anxiety and improved attitude towards the subject among teacher trainees.

The above reviewed literature clearly indicates the potential of mathematics workshops in improving cognitive abilities and pedagogical competencies. However, considering the changing demands of teacher education and the need for innovative pedagogical practices, it becomes essential to empirically investigate the impact of mathematics workshops on B.Ed. students. The present study is therefore significant in contributing to teacher education research and enhancing the quality of mathematics teaching at the secondary level.

METHODOLOGY:

- **Variables of the study:**
- Independent Variable: Mathematics Workshop
- Dependent Variable: Learning of Mathematics of Science student-teachers
- Moderate variables:

- Gender (male/female)
- Pedagogy subjects (PM/CB)
- Locality (rural/urban)
- Residential status (hosteller/non-hosteller)
- **Sample and Sampling technique:**
 - Descriptive survey method was adopted for this research study. Purposive sampling technique was used to collect the data. The researcher purposively selected 24 science student-teachers of Sree Siddaganga College of Education, (Sree Shivakumara Swamiji Road) Tumakuru city, Karnataka, India, who participated in the Mathematics Workshop organised by the college.
- **Tool of the study:**
 - A self-constructed test (consisting of 20 MCQ's) was administered to the student-teachers through Google form.
- **Statistical technique:**
 - The data collected was statistically analysed by using Mean, Standard Deviation & t-test.

HYPOTHESES

H01 : There is no significant difference in the impact of Mathematics workshop on Mathematics learning of male and female science student teachers.

H02 : There is no significant difference in the impact of Mathematics workshop on Mathematics learning among science student teachers with different pedagogy subjects.

H03 : There is no significant difference in the impact of Mathematics workshop on Mathematics learning among science student teachers from different localities.

H04 : There is no significant difference in the impact of Mathematics workshop on Mathematics learning among science student teachers with different residential status (hostellers and non-hostellers).

FINDINGS AND DISCUSSION

Table 1- Mean and Standard Deviation of Student – Teachers Responses

Variables	N	Mean	Standard Deviation
Male	3	18.33	3.51
Female	21	17.71	4.18
PM	18	17.0	4.86
CB	06	17.0	2.16
Rural	19	17.21	4.16
Urban	05	20.0	4.69
Hosteller	08	17.87	4.85
Non-hosteller	16	17.75	4.21

Table 2 – N, Mean, Standard Deviation and T-value Significance

	Variables	N	M	SD	T-value	Significance (0.05 level)
Gender	Male	3	18.33	3.51	0.28	Not significant

	Female	21	17.71	4.18		
Pedagogy subjects	PM	18	17.0	4.86	0.0	Not significant
	CB	06	17.0	2.16		
Locality	Rural	19	17.21	4.16	1.30	Not significant
	Urban	05	20.0	4.69		
Residential status	Hostellers	08	17.87	4.85	0.062	Not significant
	Non-hostellers	16	17.75	4.21		

The above statistical analysis reveals the following: -

- **Gender (Male vs Female):** The obtained t-value was 0.28, which is less than the critical value at 0.05 level of significance. Hence, the impact of Mathematics Workshop on the mathematics learning of male and female science student-teachers is not significant. Therefore, the null hypothesis was accepted.
- **Pedagogy (PM vs CB):** The obtained t-value was 0.00, which is less than the critical value at 0.05 level of significance. This indicates that the impact of Mathematics Workshop is not significant on the mathematics learning of PM & CB student-teachers. Therefore, the null hypothesis was accepted.
- **Locality (Rural vs Urban):** The obtained t-value was 1.30, which is less than the critical value at 0.05 level of significance. This shows that the impact of Mathematics Workshop on the mathematics learning of rural & urban student-teachers is not significant. Therefore, the null hypothesis was accepted.
- **Hostellers' vs non-Hostellers:** The obtained t-value was 0.062, which is extremely small even at 0.05 level of significance. This means that the impact of Mathematics Workshop is not significant on the mathematics learning of student teacher who are hostellers & non-hostellers. Therefore, the null hypothesis was accepted.

RESULT:

The analysis of the research highlights the following results:

- There is no influence of gender on the mathematics learning of science student teachers through mathematics workshop.
- There is no influence of pedagogy subjects on the mathematics learning of science student teachers through mathematics workshop.
- There is no influence of locality on the mathematics learning of science student teachers through mathematics workshop.
- There is no influence of residential status on the mathematics learning of science student teachers through mathematics workshop.

CONCLUSION

The results reveal that there was uniform impact of mathematics workshop on the mathematics learning of student teachers irrespective of gender, pedagogy subjects, locality & residential status. Therefore, the impact of mathematics workshop is not influenced by the demographic and academic groups. Hence,

mathematics workshops can be considered as an inclusive and effective instructional strategy in B.Ed. colleges.

EDUCATIONAL IMPLICATIONS

1. Workshop should be an integral part of B.Ed. Curriculum.
2. It provides equal learning opportunities and promotes equity in preparing student teachers for teaching.
3. It helps teacher educators to address the students with diverse learning background in a collaborative learning environment.
4. It encourages student-teachers to give practical experience to their students.
5. It suggests the policy makers to make workshop as an effective teaching strategy to improve the quality of teaching mathematics in B.Ed. colleges.

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