



“A Study On Effectiveness Of Steam Education Pedagogy Awareness Programme For Pre –Service Teacher Trainees”

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Abstract:

The purpose of this study was to investigate the effectiveness of STEAM Education Programme. the following objectives formulated for conducting study: 1-To Create Awareness about STEAM Education Pedagogy among Pre –Service Teachers.2-To Assess Awareness about STEAM Education Pedagogy among Pre –Service Teachers. Simple Random sampling technique used to select samples.50 pre service teacher trainees of B.Ed course of Raja S.P Sign Degree College, Agra Dist, Uttar Pradesh. selected as the sample size of the study. Experimental research method, post Test only control group design selected to conduct the study. following Research Hypothesis formulated. 1- H1: “There is a significant correlation between Male and Female Pre Service Teachers Awareness about STEAM Education Pedagogy”.2-H1: “There is a significant correlation between Arts Subject Pre Service Teacher Trainees and Science Subject Pre Service Teacher Trainees Awareness about STEAM Education Pedagogy”. To create awareness about STEAM Pedagogy. Researcher developed a programme through PowerPoint Presentation covering the origin and development of STEAM Education, Philosophy, and Rational behind adding “A” in STEM Education Concept. Significance, procedure of planning STEAM Activities, Teaching Method, and Assessment of STEAM Concept. Presented STEAM Lesson Plan Design. For data collection ,Questionnaire self standardized consist of 23 items had been framed to assess awareness of Teacher Trainees. For data analysis Pearson correlation coefficient test used. And it had been find from data analysis. There is slightly positive corelationship between Arts and science subject teacher trainees of B.Ed course regarding STEAM Pedagogy. And along that it had been find there was positive High Corelationship between Male and Female Pre Service Teacher Trainees in Awareness of STEAM Pedagogy Concept.

Key Words: STEM , STEAM, Arts Subject Pre Service Teacher Trainees, Science Subject Teacher Trainees, STEAM Pedagogy.

Introduction

The fields of science, technology, engineering, and mathematics (STEM) have attracted a lot of interest. In recent years, and it continues to expand. The task of teaching and learning that integrates STEM inquiry is considerably more difficult in situations where typically, the students are accustomed to successfully following guided, step-by-step directions take part in finishing a task (Sergis et al., 2019). a question of Science and math education integration is seen as one of the most effective pedagogical methods for involving students and

through independent research as part of the educational process 2016 (Lazonder and Harmsen). Overall, incorporating STEM The curriculum's teaching and learning strategies are principally to strengthen their capacity to adapt to and participate in the the 21st century and enhance educational performance across all subjects areas For teachers who have never encountered this situation before, such educational activities to introduce them to their classrooms (Quinn and Bell, 2013, p. 26). Teacher expertise in teacher education, development does not begin or end, rather it is impacted by it (Milner-

Bolotin, 2018). For this purpose, it is essentially important to know how to use STEM in the classroom, pre-service STEM teachers must be prepared, both conceptually and methodologically. As well as for STEM teaching strategies.

Review Of Literature:

Tekerek, B., & Karakaya, F. (2018), The purpose of this study was to evaluate the STEM awareness of incoming science instructors in terms of several factors. Data were gathered from 148 pre-service science instructors who were recruited using the convenience sampling approach and were enrolled at a state institution in Turkey. There is no statistically significant variation in the amount of STEM understanding among pre-service science teachers according to gender, academic achievement, frequency of technology use, or family income. Despite the fact that their grade-level differences in STEM awareness are substantial. Berisha F and Vula E (2021) ,This study offers a collaborative STEM activity that integrates math and chemistry to improve pre-service math and chemistry teachers' STEM understanding. Pre-service teachers received well-organized, planned on-site seminars on STEM activities while expanding their pedagogical techniques and material knowledge in the areas of math and science. The findings demonstrate that the workshop's collaborative, participatory practices had a positive impact on pre-service teachers' conceptualization of STEM. Sanders (2009, p. 22) states that introducing pre-service teachers to “the foundations, pedagogies, curriculum, research, and contemporary issues of each of the STEM education disciplines, and to new integrative ideas, approaches, instructional materials, and curriculum” is essential. However, teachers are skilled at teaching. only one subject, and STEM isn't addressed in the curriculum. Similar to how basic teacher education emphasizes separate academic fields, as noted by Blackley and Howell(2015). The main goals of integrating STEM into the curriculum are to improve learning results across the board and to provide students with the skills they need to function in 21st-century society. It will be challenging

for teachers to implement such activities in their classrooms if they have never done so in their own learning (Quinn and Bell, 2013, p. 26).

Significance of the study:

Pre-service teachers should be introduced to STEM Education and given the opportunity to design and teach integrated STEM as early as during their studies, according to Kennedy and Odell (2014). Countries need to offer a comprehensive curriculum, teacher training, guidance, and assessment, integrate technology and engineering into the science and mathematics curriculum, and promote engineering design pedagogy and scientific inquiry. Teaching pre-service teachers how to collaborate while providing them with integrative STEM activities will improve their understanding of STEM teaching and learning. Future teachers should be encouraged to think about how STEM courses might be incorporated in significant ways for aspiring students.

Delimitation Of The Study:

The Delimitation of the present study were as follows:

(a)Geographical Area

(i)This study was delimited to only Agra Dist, Uttar Pradesh.

(b)Level of Education:

(i)This study is delimited to Pre service teacher trainees of B.Ed College.

(c) Sample Size:

(i) This Study is only Limited to 50 Pre Service Teacher Trainees.

OBJECTIVES OF THE STUDY:

- 1- To Create Awareness about STEAM Education Pedagogy among Pre – Service Teachers.
- 2- To Assess Awareness about STEAM Education Pedagogy among Pre – Service Teachers.

Research Methodology:

This section outlines the research methodology employed, the research methods used, and the methods and strategies used to determine the perspectives of the Pre Service teachers who participated in the study.

a) Research method

In this study Experimental research method, post test control group design was used. The post test-only control group design is basic experimental designs

where participants get randomly assigned receive an intervention, and then the outcome of interest is measured only once after the intervention takes place in order to determine its effect.

b) Population of the study:

Population in this research is the Pre Service Teacher Trainees of B.Ed course, Agra district. Uttar Pradesh

c) Sample of the Study:

In this study Random Sampling technique was used for selection of samples. 50 Pre Service Teacher Trainees selected from Raja S.P Sign Degree College as a sample Size of the study.

VARIABLES OF THE STUDY

For the present study the following variables going to consider:

(a) Independent Variable

STEAM Education Programme designed and developed through Power Point Presentation. to create awareness of STEAM Pedagogy that can be utilized in Teaching Learning Process.

(b) Dependent Variable

In Present Study Dependent Variable are Pre Service teacher Trainees of B.Ed Course.

(c) Moderate Variable

The Following are the Moderate Variable of the Study are:

1- Subject Background of Teacher Trainees.

a) Arts Subject.

8) Data Analysis:

H1: “There is a significant correlation between Arts and Science Subject Pre Service Teachers in Awareness about STEAM Pedagogy”.

b) Science Subject.

2- Gender.

a) Male.

b) Female.

Hypothesis Of The Study:

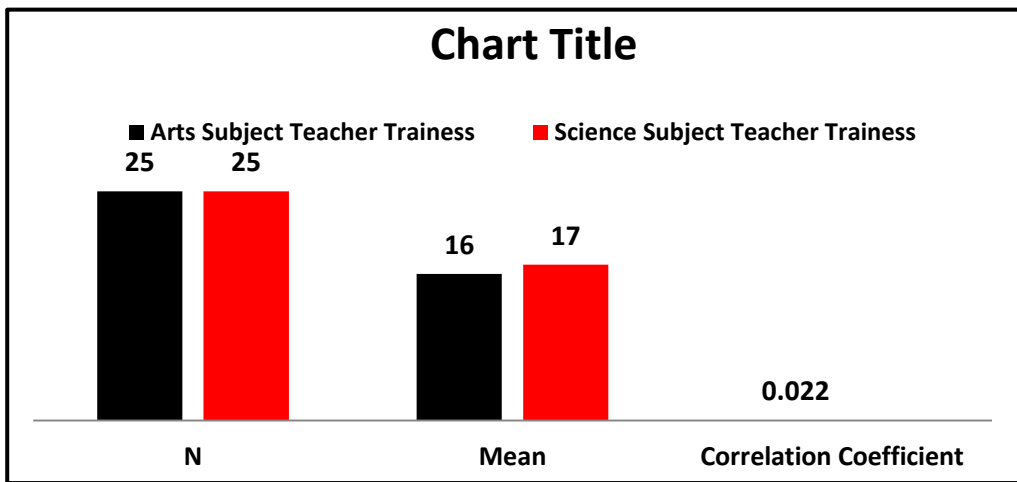
1- H1: “There is a significant correlation between Arts and Science Subject Pre Service Teachers in Awareness about STEAM Pedagogy”.

2- H1: “There is a significant correlation between Male and Female Pre Service Teachers Awareness about STEAM Education Pedagogy”.

Data Collection Tool:

A Objective type Test developed to assess the awareness of STEAM Pedagogy Knowledge. The Test initially consists of 30 questions. The Test was finalized by the examination of a specialist in measurement field, a specialist in mathematics education, two academicians specializing in science education and classroom teacher. An item was removed as it was not adequate for the study and 23 questions amended and finalized, as they were not clear in line with the opinions of experts. content validity was provided in the direction of expert opinions was employed to 30 teacher trainees. The Kuder-Richardson Formula 20, is used to measure the internal consistency reliability of a test .the test result got more the 0. 75 reliability.

			N	Mean	Correlation Coefficient	Interpretation
Arts Subject Teacher Trainees	25	16	0.022			Slightly Positive Corelationship
Science subject Teacher Trainees	25	18				



Data Interpretation:

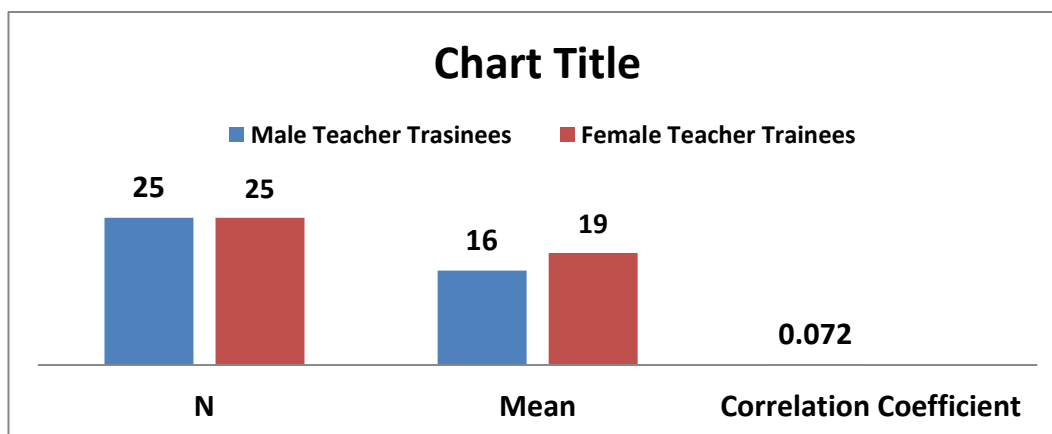
From the above data analysis it had been find there is slightly positive correlation between Arts and science subject teacher trainees of B.Ed course regarding STEAM Pedagogy.

So H1: “There is a significant correlation between Arts and Science Subject Pre Service Teachers in Awareness about STEAM Pedagogy”. Is accepted and H0

:“There is a no significant correlation between Arts and Science Subject Pre Service Teachers in Awareness about STEAM Pedagogy”. Was rejected the rational for slight positive correlation was different background of subjects that enable to understand the STEAM Pedagogy .so it can be conclude arts background teacher trainees feel difficult to understand the concept of STEAM Pedagogy and how to apply in practically.

H1: “There is a significant correlation between Male and Female Pre Service Teachers Awareness about STEAM Education Pedagogy”

	N	Mean	Correlation Coefficient	Interpretation
Male Teacher Trainees	25	16	0.072	High Corelationship
Female Teacher Trainees	25	19		



Data Interpretation:

From the above data analysis it had been find there was positive High Corelationship between Male and Female

Teacher Trainees in Awareness of STEAM Pedagogy Concept.

So, H1: “There is a significant correlation between Male and Female Pre Service

Teachers Awareness about STEAM Education Pedagogy”, was accepted. H0 “There is a no significant correlation between Male and Female Pre Service Teachers Awareness about STEAM Education Pedagogy”, was rejected. It can be said gender does not play an important role in understanding STEAM Pedagogy. Both the male and Female Pre Service teachers do not feel difficulty in understanding concept of STEAM Pedagogy.

9) Education Implication

- 1- This Study made an attempt to create awareness about STEAM Pedagogy. Among Pre service Teacher Trainees.
- 2- This study helps to identify the barriers of Arts Pre Service Teacher Trainees. To understand and integrate STEAM Pedagogy in their teaching Practice.
- 3- This Study recommends to have integrated curriculum for implementing STEAM Pedagogy.
- 4- This Study offers further research to have STEAM Activities on a wide variety of Concepts.

Conclusion:

Appendix

The requirement to improve pre-service teachers' competence to the necessity to teach STEM-integrated subjects alongside the need to examine the efficiency of such cooperative methods to education programmes for teacher preparation that are improved. That is only the results of the post-reflection questions were included in the paper were examined. Our goal was not to look into changes in knowledge after the Program. However, we wished to learn as many concepts and perceptions from pre-service teachers. The introduction of pre-service instructors should early on in their studies, permitted to design and teach integrated STEM. Modeling teamwork while Pre-service teachers will benefit from activities that integrate STEM. Increase awareness of STEM education and study. Future Teachers need to be encouraged to think about how STEM disciplines can integrate in ways that are significant to potential students. According to this study, pre-service instructors are effectively conceived of STEM and STEM pedagogical methods.

Sl No	Statements	Yes	No
	What Is STEAM Education		
01	STEM Education has 4 letters stands for studies in Science, Technology, Engineering and Mathematics or Medicine.		
02	STEM Education is a form of imparting knowledge to ensure that learners get practical skills that they can apply in Science, Technology, Engineering, and Mathematics.		
03	Students make more meaning and are exposed to real-world concepts through STEAM integration.		
	Adding Art to The STEM Framework		
04	The integration of the arts into STEM learning helps in collaboration in a variety of ways.		
05	The idea is to teach kids to become both analytical thinker <i>and</i> a creative thinker		
06	This holistic approach encourages students to exercise both the left and right sides of their brains simultaneously.		
	Significance of STEAM Education		
07	STEAM brings together five critical disciplines to create an inclusive learning environment.		
08	Encourages all students to participate, collaborate and problem solve		
09	As opposed to traditional models of teaching, the STEAM framework blurs the lines between disciplines.		
10	Students are taught <i>how</i> to ask questions, <i>how</i> to be innovative and <i>how</i> to create.		
	STEAM EDUCATION Develop following skills		
11	Great communication and collaboration		

12	Digital literacy, Problem Solving, Critical thinking,		
	STEAM Education model are based around the following principles		
13	Integrated learning, which intentionally connects standards, assessments, and lesson design and implementation.		
14	Process-based learning, which encourages inquiry and collaboration from students.		
15	STEAM subjects are taught and assessed in and through each other		
	STEAM curriculum		
16	Collaborative planning, involving teachers from each discipline.		
17	Adjusting the timetable to accommodate this new style of teaching and learning.		
	Assessment in STEAM teaching and learning		
18	STEM shouldn't be about whether you're a strong writer or memorizer; it's more about practical creativity and problem-solving.		
19	Formative Assessment consider most suitable in STEAM Education		
20	Formative Assessment allowing them to easily pinpoint areas that need improvement.		
	STEM teaching methods Are		
21	Project-Based Learning		
22	Problem based Learning.		
23	Enquiry Based Learning.		

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