Effectiveness of Brain Based Learning Programme on Enhancing the Mentoring Skills of Pre-Service Teachers

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Abstract: This research paper focuses on studying the effectiveness of Brain based Learning programme on enhancing the mentoring skills of pre-service teachers. The classification of learners was done according to their learning style. A standardized test constructed by Dr. Venkataraman (SOLAT) was used for identification of the learning style of the pre-service teachers. The 4pre-service teachers in the sample were identified with two dominant learning styles out of the five learning styles. The teacher made Self Evaluation Rating Scale test was administered for the evaluation of mentoring skills. This study implies that the use of appropriate brain based learning programs, based on learner’s learning style is effective in enhancing the mentoring skills of pre-service teachers.

Keywords: Brain based learning programme, learning styles, mentoring skills

1. Introduction

Mentors are guides. They lead us along the journey of our lives. Mentoring is an interactive, developmental relationship between individuals of different levels of experience and expertise, which incorporate carrier and interpersonal development and emphasizes mutual learning needs.

Basically each student has a special learning mode or style. Once a Teacher understands the learning style of the students, it is easy for the teachers to select the most appropriate method of teaching.

Brain based learning requires basic knowledge of the specific areas of the brain that are impacted and then manipulating the classroom to provide a positive learning environment to increase academic growth (Erlauer, 2003; Jensen, 1996, 2005; Jones, 2003; Sprenger, 2002; Wolfe, 2001).

Caine and Caine define brain-based learning as “recognition of the brain’s codes for a meaningful learning and adjusting the teaching process in relation to those codes.” (Caine and Caine, 2002)

Being a teacher educator, the researcher thinks that, if a brain based learning programme based on teacher-trainees’ learning styles is developed then it will be helpful in developing the mentoring skills of the teacher-trainees.

Mentoring Skills:

Mentoring’ as a concept and practice that is related to facilitating professional learning in healthcare has evolved consistently since the 1970s and was formally implemented in pre-registration nursing and midwifery education in the 1980s. Slightly different titles and terminologies are used by different healthcare professional groups for this role, and different definitions have been offered over time as research and expert opinions have influenced the forms in which it is currently utilized.[1] 

Mentoring skills can be divided into organizational and interpersonal skills.

Classification of Mentoring skills developed from ‘Preparedness to practice, mentoring scheme, July 1999. NHSE/ Imperial College school of Medicine.

<table>
<thead>
<tr>
<th>Mentoring Skills</th>
<th>Organizational Skills</th>
<th>Interpersonal Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>Coaching/teaching</td>
<td></td>
</tr>
<tr>
<td>Contracting</td>
<td>Listening</td>
<td></td>
</tr>
<tr>
<td>Recording</td>
<td>Negotiating and influencing</td>
<td></td>
</tr>
<tr>
<td>Structuring sessions</td>
<td>Giving constructive feedback</td>
<td></td>
</tr>
<tr>
<td>Time management</td>
<td>Invention-prescriptive, informative</td>
<td></td>
</tr>
<tr>
<td>Scheduling</td>
<td>Confrontational, catalytic</td>
<td></td>
</tr>
<tr>
<td>Evaluating</td>
<td>Supportive</td>
<td></td>
</tr>
<tr>
<td>assessing</td>
<td>Questioning</td>
<td></td>
</tr>
<tr>
<td>Report writing</td>
<td>Motivating and encouraging</td>
<td></td>
</tr>
<tr>
<td>Maintaining Boundaries</td>
<td>Self-awareness</td>
<td></td>
</tr>
<tr>
<td>Action planning</td>
<td>Reflecting</td>
<td></td>
</tr>
<tr>
<td>Prioritizing</td>
<td>Non-judgmental</td>
<td></td>
</tr>
<tr>
<td>Facilitating</td>
<td>Non-prejudicial</td>
<td></td>
</tr>
</tbody>
</table>

Selected Mentoring skills after the Opinionnaire filled by the Teacher Educators.

<table>
<thead>
<tr>
<th>Mentoring Skills</th>
<th>Organization Skills</th>
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<tr>
<td>Planning</td>
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</tr>
<tr>
<td>Scheduling</td>
<td>Questioning</td>
<td></td>
</tr>
<tr>
<td>Evaluating</td>
<td>Motivating and encouraging</td>
<td></td>
</tr>
<tr>
<td>Action planning</td>
<td>Self-awareness</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Classification of Mentoring Skills

Table 2: Selected Mentoring Skills
Learning styles:

Many researcher, educationists, psychologist had explained the meaning of learning style according to their experiences and study. Some of their ideas about learning style were given below.

According to Kolb (1984), learning style is a product of two choice decisions;

1. How to approach at task i.e. grasping experiences.
2. Our emotional response to the experience i.e. transforming experiences. [2]


These definitions reveal that- Learning styles are simply different approaches or ways of learning. Learning styles refers to student’s preferences for some kinds of learning activities over others. Learning style refers to prefer mode of problem solving thing or learning used by an individual.

Dr. D. Venkataraman (1994), an Indian expert has constructed the SOLAT test which is best suitable for Indian learning environment. This test of learning and thinking styles of the students is an advance version of Torrance SOLAT test. This test was selected for identification of learning styles of students in the research study.

Brain based Learning (BBL):

The roots of brain-based learning principles are in neurological research, particularly during the 1990s. In fact, the 1990s was themed “the decade of the brain” (Bush, 1990; Roberts, 2002; Sousa, 2001).

BBL involves accepting the rules of how the brain processes, and then organizing instruction bearing these rules in mind to achieve meaningful learning (Caine and Caine, 1994).

Brain based principles by Caine and Caine are,

1. The brain is a parallel processor.
2. Learning engages whole physiology.
3. Search for mentoring innate.
4. Search for meaning through patterning
5. Emotions critical to patterning
6. Brain processes whole and part simultaneously
7. Learning both focused and peripheral
8. Learning conscious and unconscious processes
9. Memories contextual and rote
10. Each brain is uniquely organized
11. Learning enhanced by Challenges & inhibited by threats
12. Learning is developmental.

The brain based learning programme involve range of activities which includes Quiz/ Competition, Role plays, Educational games, Plays, OHP, Group discussions, Oral presentation/lectures, Collaborative work, Slide show, Diagrams/posters.[4]

In the present study, learning style was used as the criterion to classify the learners, to provide them with different learning experiences by selecting appropriate brain based learning Programme for enhancing the mentoring skills of pre-service teachers.

2. Statement of the Problem

Development of brain based learning programme for enhancing the mentoring skills of pre-service teachers from English medium B.Ed. colleges, which are affiliated to Savitribai Phule Pune University, Pune and its effectiveness.

3. Need and Importance of the Study

3.1 Need

Bachelor’s degree in Teacher Education course is a course of two years. During this course, the pre-service teachers have to develop the various skills of teaching and mentoring. For enhancing these skills, the brain based learning programme can be developed. The learning styles can be identified for maximizing the potential of mentoring skills.

3.2 Importance

The brain based learning programme will be practically used in the classroom to enhance the mentoring skills of pre-service teachers.

The teacher educator will develop and enhance mentoring skills by keeping in mind the learning styles of the pre-service teachers.

4. Definitions of the important terms

1. Brain based learning:

Theoretical definition

“Brain-based learning is a comprehensive approach to learning based on neuroscience.” (Jensen, 2008).

In research,

Brain-based learning refers to the appropriate selection of teaching methods, lesson designs, and school programs that are based on the latest scientific research about how the brain learns. How the students learn differently as they age, grow, and mature socially, emotionally, and cognitively are the cognitive development factors of brain based learning.
2. Learning Styles:

Theoretical definition

“Knowledge acquired by the different ways of learning and making the meaning of information is called learning Style.”
(Illustrated Oxford dictionary, 2006)

In research,

Every student has a unique primary learning mode or a way of learning by which he/she learns speedily and effectively.

3. Mentoring:

Theoretical definition

“A philosophy about people and how important they are to an organization.” (Luna & Cullen, 1995)

In research,

It is the process of developing the essential skills in the teacher trainee for making them effective mentors.

4. Mentoring skills

In research,

The interpersonal skills e.g. coaching/teaching, listening, questioning, reflecting, negotiating and influencing, giving constructive feedback etc. and organizational skills e.g. planning, evaluating, facilitating, time management etc. are some of the important mentoring skills which are needed to be developed in the pre-service teachers for making them successful mentors.

5. Pre-service teachers:

Theoretical definition

“A person, who has taught how to do a teaching job,”
(Hornby, 2000)

In research,

The students pursuing their Bachelor’s degree in Teacher Education course and are undergoing training at English medium B.Ed. College to become secondary school teachers.

6. Effectiveness

In research,

It is an enhancement shown in the scores of post-test when Brain based learning Programme based on the learning styles of pre-service teachers was used for enhancing their mentoring skills.

5. Objectives of the Study

1. To identify the learning styles of B.Ed. pre-service teachers using a standardized test.
2. To develop brain based learning programme based on learning Styles of the pre-service teachers for developing their Mentoring Skills and implement the BBL programme.
3. To study the effectiveness of brain based learning programme on Mentoring skills of the pre-service teachers.

Variables:

Independent Variable of the experiment was the treatment given i.e. a BBL program prepared by the researcher using brain based learning activities/strategies according to the learner’s learning style for enhancing the mentoring skills of the pre-service teachers.

Dependent Variable of the experiment is the development of mentoring skills in the pre-service teachers in the post-test, with reference to their learning styles.

Control Variables of the experiment are mentoring skills, subjects: Educational Management & Guidance and Counselling, Students of English medium B.Ed. Colleges.

Intervening variables- interest of the students, attention, grasping power.

6. Hypothesis

6.1 Research Hypothesis

1. There will be a significant difference between mean scores of the pre-test and post-test of the mentoring skills of pre-service teachers when BBL Programme is implemented.

6.2 Null Hypothesis

1. There will be no significant difference between mean scores of pre-test and post-test of the mentoring skills of teacher-trainees when BBL Programme is implemented.

7. Methodology

The experiment was conducted to find a new knowledge by using the theoretical knowledge.

For the above research study, Multi-method of research was adopted.

For the present study, the researcher has selected the Incidental Sampling Method based on Non-Probability method of Sampling.
7.1 Sample:


7.2 Design:

The study adopted Pre-experimental design of Single group pre-test post-test design.

O 1 X O 2

Pre-test Treatment Post-test

7.3 Procedure:

The procedure of the present study was as follows:

7.3.1. Selection of tools for identification of learning style of the students:

Dr. Venkataraman (1994) is an Indian expert, who has constructed the SOLAT test.

Table 3: Structure of SOLAT tool

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Dimensions</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Learning style</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Verbal</td>
<td>1 to 5</td>
</tr>
<tr>
<td>2.</td>
<td>Content preference</td>
<td>6 to 10</td>
</tr>
<tr>
<td>3.</td>
<td>Class preference</td>
<td>11 to 15</td>
</tr>
<tr>
<td>4.</td>
<td>Learning preference</td>
<td>16 to 20</td>
</tr>
<tr>
<td>5.</td>
<td>Interest</td>
<td>21 to 25</td>
</tr>
<tr>
<td>2</td>
<td>Thinking style</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Logical/Fractional</td>
<td>26 to 30</td>
</tr>
<tr>
<td>2.</td>
<td>Divergent/Convergent</td>
<td>31 to 35</td>
</tr>
<tr>
<td>3.</td>
<td>Creative</td>
<td>36 to 40</td>
</tr>
<tr>
<td>4.</td>
<td>Problem solving</td>
<td>41 to 45</td>
</tr>
<tr>
<td>5.</td>
<td>Imagination</td>
<td>46 to 50</td>
</tr>
</tbody>
</table>

7.3.2. Administration of learning style inventory:

The researcher administered SOLAT learning style inventory to 44 S. Y. B.Ed. Pre-service teachers. Classification of pre-service teachers of the sample into the groups based on the Learning preferences was done.

According to the learning styles of the students, they are classified into 2 groups.

Group1- 20 students out of 44 students have preferred **Content learning style** (45.45%)

Group2- 24 students out of 44 students have preferred **Interest learning style** (54.55%)

7.3.3. Brain Based learning (BBL) programme

The learning style was used as criteria to classify the learner, to provide them with different learning experiences.

The 2 groups were taught 3 units from educational management and 3 units from Guidance and counseling text-book using the Brain based learning Programme.

The text-books are based on the New Revised Syllabus (2015) published by Success Publication, Pune [8][9].
Table 4: The details of BBL Programme based on Learning style and Subjects/ units

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Mentoring skills</th>
<th>Name of the Subject /unit</th>
<th>Strategies used and time allotted for each group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>3:00pm-4:00pm</td>
</tr>
<tr>
<td>A</td>
<td>Interpersonal Skills</td>
<td></td>
<td>Strategies/ Activities organized for Group 2. (Content L.S.)</td>
</tr>
<tr>
<td></td>
<td>1. Coaching/teaching</td>
<td>Class management</td>
<td>Slide show</td>
</tr>
<tr>
<td></td>
<td>2. Giving constructive feedback</td>
<td>Mentoring skills &amp; need of guidance</td>
<td>Group discussion</td>
</tr>
<tr>
<td></td>
<td>3. Questioning skills</td>
<td>Counseling for special Children</td>
<td>Organizing quiz &amp; report writing</td>
</tr>
<tr>
<td></td>
<td>4. Motivating and encouraging</td>
<td>Roles and qualities of human resources &amp; time management</td>
<td>Poster making</td>
</tr>
<tr>
<td></td>
<td>5. Self Awareness</td>
<td>Management-SWOT analysis</td>
<td>SWOT analysis</td>
</tr>
<tr>
<td>B</td>
<td>Organizational Skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Planning</td>
<td>Event management, Time management &amp; class management</td>
<td>Flow chart making &amp; presentation</td>
</tr>
<tr>
<td></td>
<td>2. Time management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Scheduling</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Evaluating</td>
<td>Types of counselling</td>
<td>Movie analysis</td>
</tr>
<tr>
<td></td>
<td>5. Action planning</td>
<td>Mentoring skills &amp; Class management</td>
<td>Conducting games with Information wheel</td>
</tr>
</tbody>
</table>

7.3.4 Administration of Post-test

The teacher made Self-Assessment Rating Scale Post-test was administered. The total marks were 400 and the duration of the test was 2 hours.

Tools

The Standardized test (SOLAT) constructed by Dr. Venkataraman and the Self-Assessment tests prepared by the researcher were used for the data collection.

Table 5: The percentage of Pre-service teachers and the preferred learning style

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Particulars</th>
<th>Total</th>
<th>Content L.S.</th>
<th>Interest L.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>No. of Pre-service teachers</td>
<td>44</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>2.</td>
<td>% of the Pre-service teachers</td>
<td>100%</td>
<td>45.45%</td>
<td>54.55%</td>
</tr>
</tbody>
</table>

Pre-service teachers’ feedback/ Opinion

The 20 pre-service teachers were available for filling the opinionnaire i.e. 10 pre-service teachers form content group and 10 pre-service teachers from interest group. The data was then collected and analyzed.

100% of the pre-service teachers felt that using brain based learning programme for enhancement of their mentoring skills was useful.

8.2. Quantitative Analysis

The techniques adopted for data analysis were Percentage, Mean and t-test [10].

Mean value was derive for group 1(content learning style) and group 2(interest learning style).

T-test was used for group 1 and group 2 separately.
Graph 1
Content learning style
Comparison of scores of Pre-test and Post-test

Table 7: A summary table of obtained t-value for group-1 (Content learning style)

<table>
<thead>
<tr>
<th>S.A Test</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>SE_M</th>
<th>γ</th>
<th>SE_D</th>
<th>t-value (Cal.)</th>
<th>Table t-value (0.01)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>20</td>
<td>237.2</td>
<td>245.94</td>
<td>54.99</td>
<td>0.9898</td>
<td>20.60</td>
<td>3.9</td>
<td>2.539</td>
</tr>
<tr>
<td>Post-test</td>
<td>20</td>
<td>374</td>
<td>383.72</td>
<td>85.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**t-value (cal.) > t-value (0.01)**

There is significant difference between mean scores of pre-test and post-test at 0.01 level of significance. So the null hypothesis is rejected. The brain based learning Programme used for group-1 (i.e. content learning style group) was effective.

Graph 2
Interest learning style
Comparison of scores of Pre-test and Post-test

Table 8: A summary table of obtained t-value for group-2 (Interest learning style)

<table>
<thead>
<tr>
<th>S.A Test</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>SE_M</th>
<th>γ</th>
<th>SE_D</th>
<th>t-value (Cal.)</th>
<th>Table t-value (0.01)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>24</td>
<td>247.9</td>
<td>254.66</td>
<td>51.983</td>
<td>0.9927</td>
<td>18.47</td>
<td>4.41</td>
<td>2.5</td>
</tr>
<tr>
<td>Post-test</td>
<td>24</td>
<td>369.3</td>
<td>377.29</td>
<td>77.014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**t-value (cal.) > t-value (0.01)**

There is a significant difference between mean scores of pre-test and post-test at 0.01 level of significance. So the null hypothesis is rejected. The brain based learning programme used for group-2 (i.e. Interest learning style group) was effective.

We can say that the Brain based learning programme prepared according to the learning styles of the pre-service teachers for development of mentoring skills is effective.
9. Fulfilling the Objectives

**Objective 1**

To identify the learning styles of B.Ed. teacher-trainees using a standardized test.

**Inference**

The pre-service teachers in the sample were identified with two learning styles out of five learning styles. These students were categorized in 2 different groups.

**Group 1-Content L.S. and Group 2-Interest L.S.**

20 students out of 44 students have preferred Content learning style i.e. 45.45%.

24 students out of 44 students have preferred Interest Learning style i.e. 54.55%.

**Objective 2**

To develop brain based learning programme based on learning Styles of the pre-service teachers for developing their Mentoring Skills and implement the BBL programme.

**Inferences**- For the present study, the researcher has prepared a brain based learning programme according to the learning style of the pre-service teachers. The programme prepared for the selected 2 types of learners is given in the table 2.

**Objective 3**

To study the effectiveness of brain based learning programme on Mentoring skills of the pre-service teachers

**Inferences**

The enhancement is seen in the mean scores obtained in the post-test after the implementation of brain based learning programme on mentoring skills of pre-service teachers according to the learner’s learning style.

A summary table of obtained t-value for group-1 (Content learning style) and group-2 (Interest learning style) is given in tables 4 and 5 respectively.

10. Major findings of the study

The null hypothesis states that there is no significant difference between mean scores of pre-test and post-test of the mentoring skills of teacher-trainees when BBL Programme is implemented.

**Group 1- Content Learning Style**

From table No. 7 It is seen that for Group 1 (content learning style) t-values (calculated) = 3.9, which was higher than table t-value (0.01 level) 2.539, so the effectiveness of the Brain based learning program is significant at 0.01 level. The null hypothesis is rejected.

**Group 2- Interest Learning Style**

From table No.8 It is seen that for Group 2 (Interest learning style) t-value (calculated) = 4.41, which was higher than table t-value (0.01 level) 2.5, so the effectiveness of the brain based learning program is significant at 0.01 level.

The null hypothesis is rejected.

The pre-service teachers have shown development and enhancement in the mentoring skills when the brain based learning programme based on the learner’s learning style was implemented.

11. Conclusions

Since the obtained t-ratio is significantly greater than the tabulated t-ratio in case of group 1 and group 2, the null hypothesis is rejected.

The brain based learning Programme developed based on the learning style of the pre-service teachers for the enhancement of mentoring skills is effective.

12. Recommendations

Brain based learning is a new trend in education. It enhances the mentoring skills of thepre-service teachers. The brain based learning program gives more scope for having more interactions in the class-rooms and in making the learning process more interesting and joyful.

It is recommended that the similar study can be carried out for enhancing the life skills. Correlation between learning style and thinking style of the students can also be studied.

References


Authors Profile

Mrs. Gangotri Vishwas Rokade has completed M.Sc. M.Ed. She has received M.Phil. Degree from Dept. of Education and Extension. Savitribai Phule Pune University, Pune. She is pursuing Ph.D. degree from Dept. of Education and Extension. Savitribai Phule, Pune University, Pune. Currently she is working as an Assistant Professor in M.I.T. S.D. B.Ed. College, Pune.

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