IS EXECUTIVE FUNCTIONING SKILLS A PREREQUISITE FOR ACADEMIC ACHIEVEMENT AMONG B.Ed TEACHER TRAINEES?

Sathishkumar A¹, Saravanan V², Jahitha Begum A³, Habeebur Rahman T⁴

¹²Ph.D Scholar(Full Time), Department of Education, Gandhigram Rural Institute (DU), Gandhigram, Dindigul (Dt.), Tamil Nadu (state), India.

³Professor and Head i/c, Department of Education, Gandhigram Rural Institute (DU), Gandhigram, Dindigul (Dt), Tamil Nadu (state), India.

⁴Managing Director, AJB Energy Solutions, Dindigul, Tamil Nadu (state), India.

ABSTRACT

Executive functioning skills are the cognitive control skill determining the academic success as well as individual success in life. Lot of research is available in literature to prove the relation between Executive functioning skills and academic achievement. The major objective of the study was to find out the relationship between the level of Executive Functioning skills and Academic Achievement. Survey method is adopted and a standardized research tool by Peg Dawson and Richard Guare (2010) of Executive Functioning Skills Questionnaire-Teen Version is used to analyzed the data. A sample of 131 B.Ed Teacher Trainees from Dindigul district at Tamilnadu is taken for analysis. The collect data was analyzed with the help of IBM SPSS statistic 23.0. The Descriptive and Differential Analysis were done. The major finding revealed that B.Ed Teacher Trainees level of Executive Functioning Skills is directly related with their academic achievement. The participants did not differ in their Executive Functioning skills with regard to their Age and Community. The study confirms that Executive Functioning skills should be considered as an important predictor of Academic Achievement.

Key words: Executive Functioning skills, Prediction, Academic Achievement, B.Ed Teacher Trainees.

INTRODUCTION

Academic Success is defined as the levels that students have achieved as their educational goal (Donnelly J. E. et al., 2016), and is usually measured by Grade Point Average (GPA) or Standardized tests (Steinmayr, R., Meibner, A., Wirthwein, L). High Academic Success was considered as a key aspect on development, predicting professional and social Success across the life course. In contrast, low academic Success was linked with leaving school and facing health problems (Freudenberg N. and Ruglis J., 2007). Academic achievement is a multi connecting concept determined by personal, social and institutional factors (Steinmayr, R., Meibner, A., Wirthwein, L). Among the individual elements that influence academic Success, Cognitive processes has been widely studied (Rohde T. E. &

"Executive functions are a set of cognitive control operations; Major four of which most studied are Attention, Inhibition, Cognitive Flexibility, and Working Memory (Diamond A., 2013)". Considering the importance of Executive functioning skills and Academic Achievement, this study has been carried out in order to find out the significant relationship between these two variables.

Stad, F. E, (2019) suggested that Cognitive Flexibility (CF) was positively correlated to students' performance. The students' learning is associated to their cognitive flexibility in the experimental group condition that showed significantly more development than the children in the control group condition. Rhodes, Sinead, (2014) study revealed that theoretical understanding of biology is significantly predicted by the Executive Function skills (EFs) of working memory and planning. Both working memory and planning predicted of a theoretical understanding of biology when another aspect of Executive Functions was controlled. Keli, Fine. (2014) reviewed that there is positive correlation between Executive Functioning (EF) and Grade Point Average (GPA). Working memory and hours depleted studying were significantly related to GPA. In this way, the possibility to prove that increase in EFs skills causes increase in Academic Success rather than simply that they are correlated with it. William Ellery Samuels (2016) established that the Executive Functions (EFs) scores during early middle grades can predict academic performance in succeeding secondary school grades. Although methodological constraint may have impeded the skills of other factors to be significantly related to Grade Point Averages (GPA), the effect of Executive Functions were strong enough to prompt us to suggest its use to guide long-term, academic
interventions. C. Malagoli and M.C. Usai (2018) found that Working memory (WM) and Inhibition tasks are both intra and inter-correlated. Age was considered to be a predictor of the latent Executive functions (EFs) factors. Ages significantly inhibit responses both in male and female, but in the WM, the effect of age was more significant only in Males. Working Memory is not influenced by age in adolescence due to females. Brain growth in girls starts and ends than in boys, peaking at 10.5 years in girls and 14.5 years in boys. Bailey B, A. (2018) evaluated the academic success and found that it is not significant associated with problems with Executive Functioning/Academic Self-concept. More significant issues with Executive Functioning are connected with decreased Academic self-concept. Executive Functioning (EFs) skills are essential for aligning Academic achievement with classroom performance. Thus research conducted in the realm of Executive Functioning skills emphasised that there is strong positive relationship between Executive Functioning skills and Academic Achievement.

**OBJECTIVES**

The following are the objectives

- To assess the level of Executive functioning skills among B.Ed teacher trainees.
- To evaluate the level of Academic achievement among B.Ed teacher trainees.
- To find out the relationship between Age and Executive Functioning skills among them.
- To determine the relationship between of Executive functioning skills and Academic Achievement among B.Ed teacher trainees.

**HYPOTHESES**

- What is the level of Executive Functioning skills and Academic Achievement among the B.Ed teacher trainees?
- Is there any significant difference between Rural and Urban Students of Executive Functioning Skills among Participants?
- Is there any significant difference among the Age of Participants in Executive Functioning skills?
- Is there any significant relationship between the Executive Functioning skills and Academic Achievement among participants?
- Is there any significant relationship between the scores of Executive Functioning skills and Age in the participants?
METHODS AND MATERIALS

In order to collect the needed information and data, Survey method was employed. The Executive Function skill was assessed using Executive Functioning skills scale, constructed by Peg Dawson and Richard Guare (2010) Questionnaire - Teen Version. It is composed of 30 items to assess the Executive Functioning skills, Questionnaire presents a Likert scale type with response values from 1(Strongly Disagree) to 4(Strongly Agree). The researcher adopted simple random sampling technique to select the participants. The participants were 131 B.Ed Teacher Trainees in Dindigul district at Tamil Nadu state.

RESULTS

The data collection and analyzed using statistic such as Mean, Standard deviation, ‘t’-test and ANOVA is given by the following tables with the help of IBM SPSS statistic 23.0.

Table 1: Level of Executive Functioning skills and Academic Achievement of the Participants

<table>
<thead>
<tr>
<th>Total Number of Respondents (N) = 131</th>
<th>Very High</th>
<th>High</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Functioning skills N (%)</td>
<td>11 (8%)</td>
<td>119 (91%)</td>
<td>01 (1%)</td>
</tr>
<tr>
<td>Academic Achievement N (%)</td>
<td>50 (38%)</td>
<td>77 (59%)</td>
<td>04 (3%)</td>
</tr>
</tbody>
</table>

The above table reveals the level of Executive Functioning skills and Academic Achievement. Among the total number of 131 participants of B.Ed Teacher Trainees, 08% of participants were Very High level in Executive Functioning skills, likewise 91% of participants were High and only 1% of Students scored Average level in Executive Functioning skills.

Among the participants, 38% of participants were Very High level in Academic Achievement, 59% of participants were High level, and 3% of the Participants were Average level in Academic Achievement.

HYPOTHESIS 1

Is there any significant difference between Rural and Urban Students of Executive Functioning Skills among B.Ed teacher trainees?
Table 2: Independent ‘t’ test for significant difference between Rural and Urban Students of Executive Functioning Skills among B.Ed teacher trainees

<table>
<thead>
<tr>
<th>Type of Variable</th>
<th>Locality of the Student</th>
<th>‘t’ value</th>
<th>‘p’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural</td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>Executive Functioning</td>
<td></td>
<td>86</td>
<td>80.04</td>
</tr>
</tbody>
</table>

Results of Independent Sample ‘t’ test show that there is no significant difference between Rural ($M = 80.04$, $SD = 8.19$) and Urban ($M = 79.29$, $SD = 9.37$) participant in Executive Functioning Skills, $t = 0.451, p > 0.05$.

**HYPOTHESIS 2**

Is there any significant difference among the different Age groups of B.Ed teacher trainees in Executive Functioning skills?

Table 3: ANOVA for significant difference among the Age of B.Ed teacher trainees in Executive Functioning Skills.

<table>
<thead>
<tr>
<th>Type of Variable</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F value</th>
<th>‘p’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Functioning</td>
<td>Between Groups</td>
<td>32.633</td>
<td>2</td>
<td>16.316</td>
<td></td>
</tr>
<tr>
<td>Functioning Skills</td>
<td>Within Groups</td>
<td>9555.947</td>
<td>128</td>
<td>74.656</td>
<td>0.219</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>9588.580</td>
<td>130</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of one-way analysis of variance showed that there is no significant difference among the three different Age groups (20, 21 and 22 and above) of B.Ed Teacher Trainees in Executive Functioning Skills, $F(2, 128) = 0.219, p > 0.05$.

**HYPOTHESIS 3**

Is there any significant relationship between the Executive Functioning skills and Academic Achievement in the participants of B.Ed Teacher Trainees?

Table 4: Karl Pearson’s Correlation Co-efficient between Executive Functioning skills and Academic Achievement in the participants of B.Ed Teacher Trainees.

<table>
<thead>
<tr>
<th>Type of Variable</th>
<th>‘r’ value</th>
<th>‘p’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Functioning</td>
<td>0.184</td>
<td>0.018</td>
</tr>
<tr>
<td>Academic Achievement</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Result of Karl Pearson’s correlation co-efficient showed that there is low positive correlation between Executive Functioning skills and Academic Achievement, \( r = 0.184, p < 0.05 \).

**HYPOTHESIS 4**

Is there is significant relationship between the scores of Executive Functioning skills and Age in the participants of B.Ed Teacher Trainees.

Table 5: Karl Pearson’s Correlation Co-efficient between Executive Functioning skills and different Age groups in the participants of B.Ed Teacher Trainees.

<table>
<thead>
<tr>
<th>Type of Variable</th>
<th>‘r’ value</th>
<th>‘p’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Functioning</td>
<td>0.102</td>
<td>0.124</td>
</tr>
<tr>
<td>skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Result of Karl Pearson’s correlation co-efficient showed that there is low positive correlation between different Age group of participants and Executive Functioning skills, \( r = 0.102, p > 0.05 \).

**FINDINGS AND DISCUSSIONS**

- 11 (8%) participants (B.Ed Teacher Trainees) out of 131 participants scored Very High level in Executive functioning skills, whereas 50 (38%) of the participants were High level in their Academic achievement. Compared to Executive Functioning skills the participants score well in academic achievement.

- Out of total number of 131 participants (B.Ed Teacher Trainees) 119 (91%) participants scored High level in Executive functioning skills. Whereas only 59% of the participants were High level in their Academic achievement. Compared to academic achievement the participants score well in Executive Functioning skills.

- The rural and urban participants did not differ in their Executive Functioning skills.

- The participants of different Age groups did not differ in their Executive Functioning skills.

- There is very low positive correlation between their Executive Functioning skills and Academic achievement.
There is very low positive correlation between different Age groups and Executive Functioning skills among the participants.

A large number of literature studies indicated that Executive Functioning skills and Academic Achievement are positively related (Feli, Fine, 2014; William Ellery Samuels, 2016; Freudenberg N. and Ruglis J., 2007). In this study exposed that, there is positively significant correlation among the participant, which is supported by the following studies.

C. Malagoli and M.C. Usai, 2018; Tomporowski P. D., Davis C. L., Miller P. H. & Naglieri J. A, 2008) In this study revealed a significant correlation of Age and Executive functioning skills.

Bailey B.A., (2018) the study evaluated the Academic Achievement is low positive significantly associated with Executive Function (or) Academic self concept.

Andr Begiewnskin (2015) identified that there is positively relationship between Executive Functioning skills (Attention control, Emotion regulation and Cognitive Flexibility) and Academic achievement.

CONCLUSION

Executive functions (EFs) play a central role in sustaining and calibrating the development of academic skills and also in school performance in general; however, lot of studies have directly targeted Executive Functioning skills as a predictor and/or correlate of school readiness and Academic Achievement. Executive Functioning skills are considered essential for learning and are positively related with academic achievement in children and adolescents (Best J. R., et al. 2011). The Executive Functioning skills are identified as one of the Major skills needed for Academic success in this 21st century and considered as prerequisite for Academic Achievement. The present study is helpful to find out the level of EFs and Academic Achievement of B.Ed teacher trainees and the relationship between the two variables. The participants are high in their EFs and very high in their Academic Achievement but there exists low positive correlation between EFs and academic achievement.

REFERENCE


