

LEVEL OF COGNITIVE FLEXIBILITY, A TOOL FOR EXPERIENTIAL LEARNING AMONG SENIOR SECONDARY SCHOOL STUDENTS

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Abstract

Learning through experience is "learning by doing." Experiential learning can be visualised as a four-stage cycle, with the first two stages allowing participants to observe, review, and reflect on what they have practised, and the third and final stage requiring participants to critically reflect in order to consciously connect their experiences to theory or earlier experiences. Cognitive flexibility is the capacity to switch between tasks as necessary. The four phases of experiential learning include thinking, acting, experiencing, and reflecting. These were applied to senior secondary school students, and it was discovered that they had enhanced cognitive flexibility abilities and could come up with new answers to problems. The "Cognitive Flexibility Scale" (CFS), created by M.M. Martin & R.B. Rubin in 1995, was the instrument utilised for data collection. This descriptive research study involved 92 participants among which 50 were girls and 42 were boys. The research finds that learning through experiential learning improves the students' cognitive flexibility, problem solving skills and reflective thinking abilities. On the whole this research finds the impact of experiential learning on cognitive flexibility among senior secondary school students.

Keywords: *Experiential learning, Cognitive flexibility, Senior secondary school students.*

INTRODUCTION

Cognitive control refers to the intentional selection of thoughts, emotions, and behaviors based on current task or demands, and the voluntary suppression of inappropriate habitual behaviors (Miller and Cohen, 2001). Examples of cognitive control include focusing on an exam while restraining the need to check Facebook, choosing fruit during diet control rather than non-veg, and remaining calm around children rather than yelling at them for spilling milk on the bed. There is a question of how cognitive control operates. Studies suggests that the lateral prefrontal cortex (LPFC) represents rules or instructions in working memory and that this information adaptively guides perceptual and motor processing in posterior brain regions,

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thus resulting in the selection of appropriate behaviors, and the suppression of maladaptive habitual actions (Miller and Cohen, 2001; Bunge, 2004).

EXPERIENTIAL LEARNING

Experience-based learning is not a novel concept. Two renowned educational theorists, John Dewey and David Kolb, each laid the groundwork for the importance of experiential learning. Dewey (1938) stated that students' potential is limited by the conventional classroom teaching method, which gave little weight to applying the knowledge learned. Kolb codified the fundamental principle of experiential education, which listed the steps necessary for learning to take place in a practical setting (1984). Kolb defines learning as the process through which experience is transformed into knowledge. (Kolb, 1984, p. 38). In a cyclical method, he proposed that experience, when joined with focused reflection, enables students to develop through experiential learning. This approach describes the path to learning by doing, reviewing, concluding, and preparing.

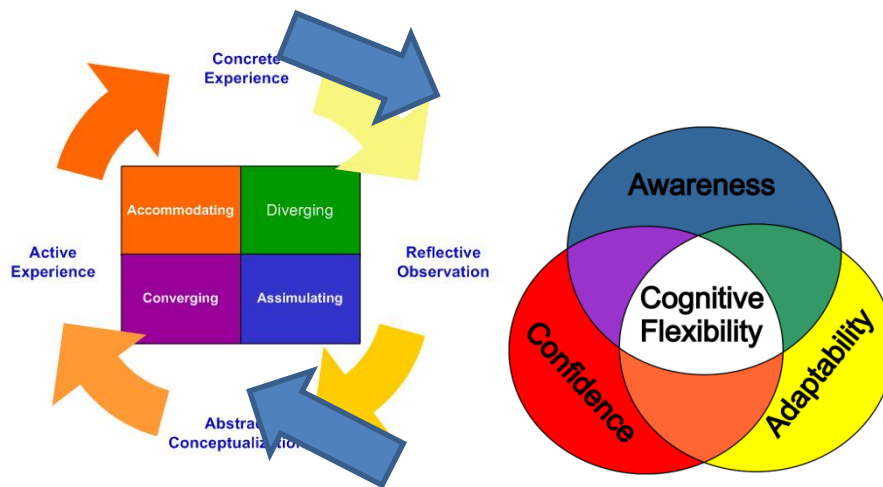


Figure 1. Link between Experiential Learning and Cognitive Flexibility

There is a strong link between experiential learning and cognitive flexibility. A student will have strong cognitive flexibility skill if that student had undergone experiential learning like industrial visits or workshops which will give hands on experience. The awareness, confidence and adaptability of a student will depend on the previous experience and learning by doing.

COGNITIVE FLEXIBILITY

To deal with the constantly changing environment, cognitive control abilities are required (Diamond, 2013). Mathematical and reading abilities, as well as physical and mental health, are all positively connected with cognitive control. (Carlson & Moses, 2001; Blair & Razza, 2007) The ability to change one's behaviour in a flexible manner is seen as a skill. Over the past ten years, research on children's cognitive flexibility has gained popularity. There is a link between executive function and education. Cognitive control is the basic for adaptation in behaviour. (Jeffrey T Coldren,2013). It plays a significant role in measuring and keeping up the development of academic skills. (Laura Visu-Petra, 2001). With this in mind, this review will examine studies involving children at school, which is their most demanding activity. School prepares children for their professional development. (D. Marques and R. Cladellas / JPER, 2018, 26(2), November, 114-131)

LITERATURE REVIEW

Jeffrey T. Coldren (2013), Cognitive control Predicts Academic Achievement in Kindergarten Children. The objective of the study was to identify whether differences in cognitive control influences academic achievement in Kindergarten Children. The participants were 65 Kinderkarten children who were failures in US school system. Random selection technique was used. The statistical techniques were Mean, Standard Deviation, Chi square test, T test. The findings were 1) Cognitive control is an essential criterion for achievement in academics of kindergarten children. 2) Children who had the capability to change their responses to a new problem achieved in academic assessment. 3) Children who were good in academics have strong cognitive control skills. 4) Cognitive control is an essential component of academic success. Yueqi Shi and Shaowei Qu (2021) Cognitive Ability and Self-Control's Influence on High School Students' Comprehensive Academic Performance. The objective of the study was to find the effects of cognitive ability and self-control on academic performance among students in a high school in Beijing. The participants were 572 students including 291 boys and 281 girls of age 16 to 18. Random Sampling technique was used. Hierarchical Linear Model (HLM) with Full model and Zero model were used as tool. The statistical Techniques used were Mean and Standard deviation. The findings of this study were 1) The self-control and academic performance of middle school children are positively correlated i.e directly proportional. 2) The five cognitive abilities (MA-Memory Ability, IPA – Information Processing Ability, RA – Representation Ability, LRA – Logical and Reasoning Ability, TTA

– Thinking Transformation Ability) were correlated with Academic performance. Hussin et al., (2000) In a similar or different setting, students will apply what they have learned in the present experience and what they have gained from previous experiences. Students will also talk about how the technique they just learned can be used in other circumstances. Finally, students will talk about how their newfound knowledge might be used to future circumstances to produce more productive behaviours.

METHODOLOGY

This research is undertaken to identify the level of cognitive flexibility among Senior secondary students. A descriptive survey research was conducted among 92 senior secondary school students with mean age 17 who were studying in 11th and 12 grades. Among which 52 were girls and 40 were boys. The tool used was Cognitive Flexibility Scale (CFS) which was designed by Martin & Rubin,1995. The questionnaire consists of 12 questions in 6-point Likert Scale scores.

RESULT AND DISCUSSION

Table 1. Students Overall Performance

Gender	Mean	Standard Deviation
Boys	4.54	0.65
Girls	4.62	0.54

From the above table, it is clear that the cognitive Flexibility levels of boys and girls are more or less equal at the mean age of 17. The mean and standard deviation scores of boys and girls had proved it in the overall performance table.

Table 2. Cognitive Flexibility Scores

Cognitive Flexibility	Girls Mean	Boys Mean	Girls S.D.	Boys S.D.
1) communication flexibility	4.94	4.7	0.63	1.22
2) hesitant to new situation	3.90	3.8	1.75	1.53
3) hesitant to take decisions	4.44	4.2	1.50	1.60

4) ability of finding solutions to unsolved problems	4.69	4.72	1.02	0.96
5) behavioural approach	3.67	4.07	1.80	1.75
6) finding creative solutions	5.19	4.9	1.08	1.12
7) adapting to situations	4.78	4.62	1.30	1.37
8) proactive behaviour	5.19	4.87	0.92	1.41
9) behavioural flexibility	4.40	4.57	1.62	1.56
10) reflective thinking	4	3.67	1.58	1.81
11) acceptance level	5.15	5.3	0.84	0.93
12) level of self confidence	5.07	5.07	1.26	1.32
Total	4.62	4.54	0.53	0.50

Note : S.D.: Standard Deviation

From the above table it is found that boys have scored high mean in behavioural question which means that the boys are good in behavioural approach compared to girls. Girls had scored high mean in proactive thinking and reflective thinking questions but any how the overall mean of both boys and girls remains the same.

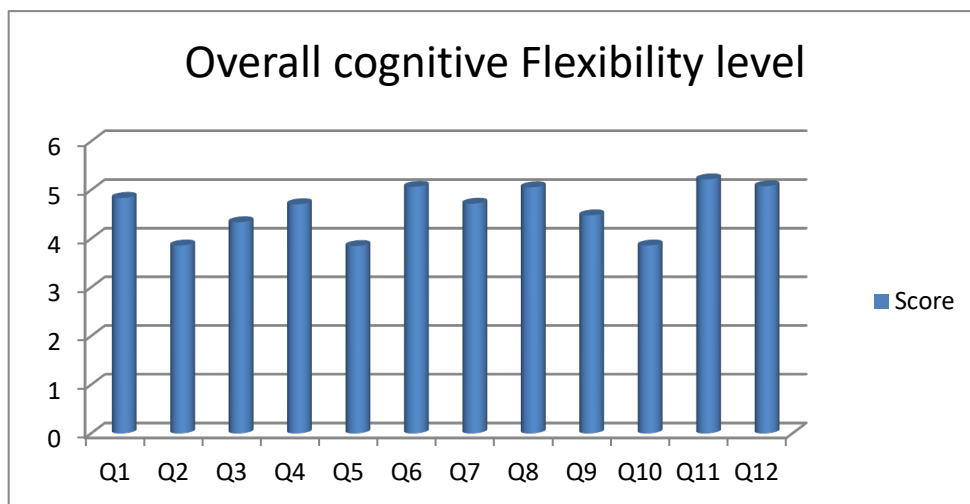


Figure 1. Bar Chart representing the overall performance of the students in each question

From the above table and bar chart, it is clear that there is a positive correlation in cognitive Flexibility and the mean score of each and every question is above the mid value 3. The highest score is for Question no:11 which shows the willingness to listen and consider alternatives to solve problems. So without gender bias students are accepting to the new changing situations and their problem solving skills are improved. Questions 6,8,12 stands second in scores which implies that the students have high confident level and they take their own decisions for complex situations. On the other hand students have scored the least score for Questions 2,5 and 10 which were related to taking risk and face new obstacles in life which implies that the students are not ready to face the unusual situations and have difficulty in using their knowledge for the real life problems.

CONCLUSION

Experiential Learning has positive impact on cognitive flexibility among senior secondary students. Problem solving skills and the reflective thinking among the students are identified to be good. Boys and Girls have more or less equal cognitive flexibility skills and there is no gender bias in making decisions when their mean age is 17. Students are lagging in facing the new and unusual situations and they are not willing to take risk. Experience and theory that interact with each other can produce knowledge: "Learning is a process by which knowledge is created through the transformation of experience". Kolb said students must go through four stages of the learning cycle which helps to get a complete learning experience. Which includes connecting learning with real-life experiences, active learning, motivation, critical and reflective thinking, and inventing and resolving problems. We conclude that cognitive flexibility and experiential learning are mutually reinforcing. However, more studies are needed to establish the underlying links.

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