Working Memory and Intelligence Contribution to Academic Achievement

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ABSTRACT

Introduction & Objective: Anticipating the role of different factors in educational advancement is among the significant concerns of all educational systems. For a long time, it was IQ which was regarded as the most important factor concerning educational performance; though, advancement in the last couple of decades in cognitive sciences provides researchers with new findings in different eras which include new findings about working memory, as well. The present article aims at scrutinizing the role of intelligence and working memory in academic achievement. Method: the present study is a Descriptive - Cross Sectional research which has been carried out through assessing correlation. The sampling includes 73 first grade-high school female students with the average age of 15.5. For this study, N-Back test and Raven Progressive Matrices Test have been used to collect the information related to predictive variable. The average scores of final exams of students were regarded as the criterion variable. The relationship between these two variables i.e. predictive and criterion was assessed by SPSS. Findings: the correlation between average score and working memory and average score and intelligence were reported (0.54) and (0.44) respectively. In hierarchical regression analyses, β coefficients demonstrate working memory with 0.43 β and intelligence with 0.25 β have a meaningful role in explaining the changes of academic performances. Conclusion: according to the findings, working memory has a more significant role in educational achievement.

Keywords Working Memory; Intelligence; Academic Achievement.

INTRODUCTION

One of the fundamental necessities and significant goals of any academic system in each society is precise recognition of the basic factors resulted in academic achievement of students and fulfilling educational goals. Academic achievement is a key criterion in determining academic performance. Seif (2001) defines academic achievement as the extent of students’ ability to reach the preplanned educational goals, which are expected to be reached through their educational attempts.

Reviewing and predicting variables which have impact on educational achievement of students and also measuring the degree of their importance, in order to make decision and plan, is of great importance. This importance necessitates researches; Researchers also are looking for those variables which can be manipulated by teaching, changing the content of books or changing teaching methodology. And this manipulation can lead to academic performance improvement.

In the beginning, IQ was considered as a good predictor of educational performance, but in fact IQ was not that much influential. This causes multiple intelligence, Spiritual Intelligence, and emotional intelligence came into existence. (Ashoori, 2013)

There is no unanimous definition of intelligence among psychologists of different approaches. It has been said that there are as many theories as the number of theoreticians regarding intelligence (Ackerman 2004); though, there are some components of intelligence upon which most theoreticians agree. Seif (2013) named these 3 components as "ability to comprehend abstract issues", "the ability to solve problems," and "the ability to learn ".

Cattle believed in two types of intelligence: fluid and crystallized. He regarded fluid intelligence as the ability to identify relationships in novel situations, independent of acquired knowledge. Fluid intelligence is the ability to think abstractly, solve problems, reason and discern relationships. This ability is regardless of prior knowledge, experience or education. The example of fluid intelligence is when someone can solve a puzzle or can suggest strategies for problem solving. Crystallized intelligence:

Unlike fluid intelligence, crystallized intelligence does rely upon a person’s prior education, learning and experiences. When someone is taking vocabulary exams or working on reading comprehension assignment they...