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## Role of Non Cognitive Skills in Academic Performance

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### **Abstract**

The role of non-cognitive skills in predicting academic performance of students is gaining importance as a topic of research in the recent years. Academic performance is vital aspect of success in education but research in this area has mostly focused on cognitive factors. But recently researches have examined the role of non-cognitive factors such as academic mind-set, academic perseverance, academic behaviour, learning strategies, social skills in academic success. To evaluate the same, several theoretical models have also been proposed by various researchers being supported by some empirical evidences.

**Key Words:** *Non-cognitive skills, academic performance, cognitive skills*

### **1.Non Cognitive Skills**

Academic performance is a complex phenomenon and is shaped by a dynamic interaction of factors intrinsic to the students and extrinsic factors. Knowledge and conventional academic skills are essential to perform well in academics. But a growing body of knowledge has emphasized the role of non-cognitive factors in academic success. The concept of 'non-cognitive skills' can be traced back to Bowles and Gintis (1976). All those factors which are not measured by cognitive test scores and IQ measures are termed as non-cognitive skills.

Cognitive skills are commonly described as "ability to understand complex concepts, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought" Pierre et al. (2014). Cognitive skills commonly include mental functions such as thinking, decision making, problem solving, attention etc. (Green 2010). Whereas Non-cognitive skills are "patterns of thought, feelings and behaviours" (Borghans et al., 2008). These are the ones that could be developed throughout lifetime and can be assessed socially. Non-cognitive skills consists of factors such as personal traits, attitudes, motivations and interests. Attitudes, behaviours and strategies

which facilitate successful performance in academic settings are considered as non-cognitive skills.

Skills are an important aspect of personal and professional growth. Skill can be measured as per the level of difficulty of the task (Attewell, 1990), or as the capability of an individual stating if one can perform the task successfully. Green (2011) takes these aspects into consideration and defines skill as a private quality that includes 3 criteria: 1) socially determined, 2) capable of manufacturing price and 3) corrigible by coaching and development.

Researches have shown that non-cognitive skills are found to be positively correlated with employment outcomes as well as education and training. Educational systems have been focusing on the role of cognitive skills on academic performance since long. But in the recent times the education system has changed a lot due to change in society, culture, demographics, family structure, and domestic and world economic states. These changes has confronted the society and education system with increased demands and challenges. Other than these challenges of education system school students are facing many other issues such as peer pressure, use of technology, media, sexual abuse, unhealthy relationships, bullying and so on. And the students who are immigrants are facing issues like fitting into the peer group, cultural and language issues, adjustment issues and so on.

Researches have demonstrated that many non-cognitive skills have a positive effect on school behaviours and academic performance. Dezmon (1995) in his study found out that academic achievement is associated with both cognitive as well as non-cognitive skills in which the cognitive skills are the class grades, ranks in class, test marks, and scores on scholastic aptitude test. He also stated that the non-cognitive variables are linked with the academic achievements of students. It was seen that at both work and school, non-cognitive variables were much more noticeable elements of success than cognitive variables. (Bowles & Gintis, 2002; Farkas, 2003).

## **2.Theoretical Framework for Non-Cognitive Factors**

### ***2.1Self-Empowerment Theory***

Tucker (1999) proposed a culturally sensitive theory called Self-Empowerment Theory which is based on an investigation with African American youth and their families to whom the theory is directed (Tucker et al 1995; 1997). The theory postulates that behavioral issues and academic disappointment, as well as altruistic behavior and academic achievement, are significantly affected by levels of (a) one's own motivation to succeed in terms of academics and social success, (b) one's perceived self-control over their action and academic achievement, (c) self-reinforcement to engage in actions leading to social and academic accomplishments, (d) adaptive skills necessary for life success, and (e) engagement in actions resulting into success.

Overall the broad analysis of the literature on academic achievement amid African American youth, and specifically African American male students directed this researcher to the Self-Empowerment Theory, as advocated by Tucker (1999), and the Resilience Research Model, as offered by Garmezy, 1983 and others later on. These scholars stated that optimistic peer and adult communication, contribution, collaboration, positive self-concept, perceived personal control, and sense of humour are directly and positively related to academic achievement.

Tucker (1999) revealed that in past several researches have focused majorly on external aspects of academic achievement of African American children. These factors are such as attitude, socioeconomic status, and level of education of parents, actions and attitudes of teacher, along with learning approaches used in the classroom. Therefore, these children must be trained to succeed under whatever conditions exist (Flenbaugh, 2014; Hilliard, 2003; Howard, 2014; Perry, 2003). This theory also states that while trying to modify the most direct and adaptable extrinsic impacts, such as actions of teachers and parents the modification of intrinsic impacts of academic and social behaviours on youth such as perceived self-control should be given priority to ease the academic achievement of these children.

Connell, Spencer, and Aber (1994) demonstrated that factors such as self-competence and self-control were found to be directly related to children's learning actions, such as studying, which directly affected their marks. Parental support, also found to have indirect impact on children's marks. Tucker (1999) developed self-empowerment theory of academic success by presenting results from her five investigations based on a Difference Model research approach (Oyemadee & Rosser, 1980) which supported the idea of finding out the contributing factors of difference among African American students rather than focusing on their limitations as compared to European American Students.

Tucker and her co-workers in their research analysed adaptive skills as well as unhealthy behaviours, influencing students' grade point averages (Tucker et al 1995) and found that all the analysed factors were contributing to grade point averages. In another investigation which analysed outspoken, unity, and family conflict as contributing factors to student's unhealthy behaviour as well as such skills which help them to adapt. (Dunn & Tucker, 1993), only family conflict was found to be an important contributing factor to unhealthy behavior.

Gaskin-Butler and Tucker (1995), revealed that self-esteem contributed to students' grades, adaptive skills, and unhealthy behaviour. Tucker, Vogel, Keefer, & Reid (2001) found that African American student's self-control, perceived social support from their primary caregiver and math success motivation are directly positively related to unhealthy behavior and academic achievement, self-control was a contributing factor to unhealthy behavior. In other studies (Fisher, 2000; Gregory, 2000; Jordan, 1981; Tucker 1999), academic inspiration seemed to be significantly

related to academic achievement of African American students in low-income families.

## ***2.2 Resilience Theory***

Resilience theory (Garmezy, 1991) postulates that risk and protective factors are the ones considered to be responsible to highly influence a person's reaction to his or her surroundings. These factors are known to be as bio-psycho-social in nature. The person is said to have a better opportunity to succeed when the protective factors overpowers the risk factors (Brown, D'Emidio, & Benard, 2001; Connell, Spencer, & Aber, 1994). Resilience theory believes that the protective factors are there in one's family, schools, and communities of the successful people but unfortunately are often not found in the surroundings of troubled youth (Krovetz, 1999; Taylor, 1994; Werner, 1993, 2000; Winfield, 1991). For children to develop resilience during their childhood the presence of these factors are considered to be mandatory.

## ***2.3 Logic Model***

Social science literature analysed some cognitive and non-cognitive factors which was viewed by this model specifically in the areas of education, economics, and psychology. Those factors are emotional intelligence, metacognition, character strengths, self-control, motivation, self-efficacy, mind-set, resilience, creativity, locus of control, social-emotional competency and wellbeing. As per the model there is conceptual relationship between these constructs. Sometimes the association may be comprehensive (e.g. emotional intelligence is a mandatory but inadequate requirement for social-emotional skill) and other times the relationship may be less vigorous (e.g. the relationship between one's character strength of love and one's explanatory style). This model also includes the factors of academic success, given the positive execution aspect of wellbeing.

## **3. Academic Behaviours**

Academic Behaviours includes all those behaviours that are necessary to define what is called as a good student such as paying attention in class, completing school work, attending class on a daily basis, taking part in class discussions, coming to work on time and prepared, along with investing extra time into studies. It becomes quite obvious to see the role of these behaviours in one's class performance.

Allensworth & Easton (2007) revealed that students with lowest scores in their eighth- grade when took admission in high school and missed their classes for less than a week per semester cleared more number of their ninth grade courses as compare to those students who were top scorers but missed their classes for more than a week.

Other than attending classes regularly, investing more time into studies and completing homework is another one of the academic behaviours which found to

have a positive correlation with student's results in both middle and high school (Cooper, 1989; Keith et al., 1993; Peng & Wright, 1994).

Keith (1982) revealed that the amount of time invested in school work was found to be having positive correlation with student's grades across success standards. Moreover, he also indicated the greater effects of completion of school work, where students with bottom third scores on their achievement tests when invested one to three hours every week in completing their school work were seemed to be capable to achieve higher grades in the level of Bs and Cs, which appeared to be equal to those with who had their exam scores in the middle one-third and did not complete their school work.

(Cooper, 2006) analysed several researches on school work completion in different settings and revealed that almost all the studies indicated towards a positive and significant relationships between school work and grades.

#### **4.Non-Cognitive variables and their measurements**

##### **4.1 Academic Perseverance**

Generally, academic perseverance refers to a group of psychological concepts such as completing homework and related assignments in stated time despites of all the challenges or distractions which often requires one's skill to stay focused on a task or assignment. It clearly states the basic difference between putting minimum amount of effort required to pass a class and choosing to put more effort and time in study or work. Thus academic perseverance is a long-term requirement for educational success.

Duckworth et al. (2007) stated that grit is found to be a mandatory factor for to high attainment more than of intelligence and ability. In another study it was suggested that grit assessments might have a higher correlation with current test scores of student but may not contribute in academic performance in future. In the same study it was also found out that self-control has a high positive correlation with grades (Duckworth, Peterson, Matthews, & Kelly, 2007).

In a similar research conducted by Duckworth and Seligman (2005) self-control was found to have high correlation with student's grades. In the famous "marshmallow" experiment (Mischel & Mischel, 1983) it was revealed that there is a strong correlation between self-control and higher grades (Shoda, Mischel, & Peake, 1990).

##### **4.2 Academic mind-sets**

Academic mind-set is referred to the attitudes or believes about relation between oneself and academic work. If one has positive academic mind-set then it will encourage the student to stay focused on academic success for long tern which in

turn will affect the academic behaviour which will lead to better academic performance.

There is ample evidence to show that academic performance of students is highly influenced by their sense of belongingness in the school (Battistich, Solomon, Kim, Watson, & Schaps, 1995; Cohen & Garcia, 2008; Furrer & Skinner, 2003; Goodenow, 1992; Goodenow & Grady, 1993; McMillan & Chavis, 1986; Ryan & Deci, 2000; Solomon, Watson, Battistich, Schaps, & Delucchi; 1996; Wentzel & Asher, 1995; Wentzel & Caldwell, 1997).

Studies also suggest that students who have faith that they have the capability to achieve higher in academics tend to put in more efforts in their work in long term which might reflect positive academic behaviours in turn leading to higher academic success as compare to those who believe that they don't have the ability to achieve higher scores even if they put in more efforts and tend to rely on other's opinion about their capability in turn performs not so well in school (Cury, Elliott, Da Fonseca, & Moller, 2006; Dweck & Leggett, 1988). One's beliefs about their efficiency, influences their performance via affecting their skills and self-concept which in turn affects their level of effort, determination, and persistence (Bandura, 1986; Bandura & Schunk, 1981; BouffardBouchard, 1990; Lent, Brown, & Larkin, 1984; Pajares, 1996; Schunk & Hanson, 1985).

#### *Learning strategies*

These can be referred as the approaches or tricks one may apply in order to facilitate their cognitive abilities such as thinking, remembering, learning etc. Effective learning approaches help students to learn in a better way that too for long term such as target setting, following a proper time table etc. Pintrich and DeGroot (1990) in their investigation, found a strong association between learning strategies and classroom performance. Pokay and Blumenfeld (1990) found that both motivation and learning strategies contributed positively to grades.

Purdie and Hattie (1996) demonstrated that students found to rely heavily on using learning strategies tend to improve their learning outcomes. Positive correlations have been found, between self-regulated learning strategy used by students and performance in both English and Math (Zimmerman & Martinez-Pons, 1986) and between use of learning strategies and higher grades in schools as well as college (Nota, Soresi, & Zimmerman, 2004)

#### **4.3 Social Skills**

Social skills include interpersonal skills such as collaboration, supportive work, affirmation, accountability, and compassion. Social skills can be referred as those desirable behaviours which plays an important role in enhancing one's social interactions, with peer or teachers etc. social skills develops during early childhood where teachers assign tasks to students which requires a collective effort to accomplish.

In a longitudinal research which examined students through grades one, three, and six till the 16 years of age, it was found that adjustment in socio-emotional states positively predicted achievement test scores every time. (Teo, Carlson, Mathieu, Egeland, & Sroufe, 1996). A recent meta-analysis carried out on different types of interventions necessary to enhance student's social and emotional competencies specifically from kindergarten to high school demonstrated positive effects of these interventions on academic attainment (Durlak et al., 2011).

## **5. Non Cognitive Skills and Academic Behaviour**

Palisoc et al (2017) explored the role of grit in academic success and willingness to pursue training in a postgraduate pharmacy course and revealed that Grit-S scores was found to be positively correlated with the likelihood to pursue training in pharmacy course successfully , but not with academic achievement during the training of a pharmacy program.

Peterson (2017) evaluated the effect of non-cognitive factors on perseverance of student athletes. She examined relationship among three motivational factors namely engagement, grit and persistence and if these were affected by race, gender or sport. She found that academic drive, student-athletic drive, and commitment were not good predictors of perseverance, but academic drive and student-athletic motivation were found to have positive correlation with engagement. Garcia (2017) studied the effect of persistence and consistency on educational attainment comparing between immigrants and school students who were native and explaining the impact of grit on school performance of immigrant students. Results revealed that there was no significant difference in grit scores between immigrant and native students and grit was positively related to educational performance.

Mason (2018) examined relationship between academic performance and grit among university students. It was revealed that students whose grit scores were higher they also achieved high academic marks comparatively to those who scored low on same continuum.

Wanzer et al (2019) investigated the impact of non-cognitive factors on academic performance and found that student's academic success was positively correlated with non-cognitive factors and the group difference variables were related to the nature and power of those associations.

Hernandez et al (2020) found in their investigation that teacher encouraged autonomy support was significantly and positively associated with satisfaction of basic psychological needs in students. Further inherent motivation was found to be a good predictor of autonomy, competency, and relatedness satisfaction. Grit-perseverance was found to be closely associated with intrinsic motivation as compared to grit-passion.

Tang et al (2020) studied effect of commitment to academic goal and grit on academic success. Results showed that students with high commitment to academic goals, high grit persistence and modest level of grit constancy achieved the highest academic success.

## 6. Conclusion

There is no denying that non-cognitive skills have a very important role to play in educational attainment. But there is still much to be done towards reliable measurement of these factors and to build non-cognitive competencies in a manner that may be generalized across contexts and are sustained over a period of time.

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