

NON COGNITIVE SKILLS AND ACADEMIC SUCCESS: A REVIEW

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Abstract: The main objective of this paper is to analyze the literature critically for development of concept and need of non-cognitive skills in students' academic success. This paper would present the holistic view of the skills that determine the success in students' life. It will give a clear reflection on the type of work done on non-cognitive till now.

Design/Approach: The paper critically examines the past researches in literature, exploring the role of non-cognitive skills in students' performance.

Findings: The paper concluded that non cognitive skills have significant contribution in the academic achievement of the students and are also related to the employability skills of the students. It has been analysed from the review that non cognitive skills are more significant in determining the success in students' life than the cognitive skills. Still there is need to explore employability skills for different jobs.

Research Implications: This review paper will provide extensive literature on the conceptual development of non-cognitive skills and its role in students' life with special reference to their success in education.

Practical Implications: The paper will be a great contribution to the researchers and management of institutions in determining the need of non-cognitive skills in improving rate of success in students' life. It will also help researchers in tracing the research gaps where research needs to be done.

Originality / Value: This paper provides research gaps in the area of non cognitive skills. It will provide directions for further research in this area. It is an individual and true effort of the researcher to review and analyze the literature critically.

Keywords: Non-cognitive skills, Academic success, Employability.

INTRODUCTION

An educated person is not always successful and vice versa. To be a successful person in life not only requires command over certain curricular subjects but a clear focus with some set of skills to be a person of heart and mind. For developing the personality to the fullest and generate efficient outputs in personal as well as academic life one needs to learn and practice academic tenants like problem solving skills, creativity, critical thinking, inter and intrapersonal skills, stress management etc. and these tenants are called as non-cognitive skills.

Cognitive skill can be measured by testing cognitive abilities and knowledge by achievement tests or standardised IQ testing. (Messick 1979), while non cognitive skills is a catch hall term for skill that cannot be tested using these tests. Various

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educators have used different terms for these skills as Durlak et. al. (2011) termed these skills as social and emotional learning, NRC (2012) defined these as 21st century skills while psychologists and economists embraced these with moral connotations of character and virtue (Peterson & Seligman, 2004; Heckman and Kant 2013).

The term non-cognitive skill is not new in the area of education. Achievement related skills are divided into two categories; cognitive and non-cognitive. For longer times cognitive skills are considered as a boon of success in students' life and even in labour market. These skills are multifaceted and include memory, reasoning etc. and may initiate to some level or may be inculcated by giving need based training and exposure. But now-a-days the scenario has changed due to fast growing world and kind of exposure to the students through different channels. Achievement in real sense is now not the output of cognitive skills only but it is well supported by non-cognitive skills also called as soft skills. The idea was originated by Harris (1940) and elaborated further by Bowels and Gintnis (1976, 2000, 2002), Jencks (1979) and Goldsmith et. al. (1997) as cited in series of papers in psychological economics specifically by James Heckman and his colleagues (2000). Further Carnerio et. al. (2003); Cuhna, et. al. (2006), Urzua and Sixtrud (2006), Cunha & Heckman (2007, 2008, 2009), Borhanns .et. al. (2008, 2011), Almlund et. al. (2011), Heckman (2011) referred the skills in their studies. Heckman & Kantz (2012) summarized this in a useful manner and renamed these as character skills in 2013. The term non-cognitive skills is as wide as the limitless universe and includes all those skills that one can think of for getting success in educational and professional career. Broadly these include motivation, self-discipline, communication skills, impulse control, presurance, social skills, confidence etc. NCF (2005) an apex document in Indian school, studies describes a lot about 21st century skills which fall under non-cognitive skills and also called as transversal skills. The initiative for these skills to be incorporated in school curriculum was taken by CBSE through CCE system. UNESCO also gave a list of non-cognitive skills which are aligned with those given by CBSE in the following table:

TABLE 1

<i>Domains</i>	<i>UNESCO</i>	
	<i>Examples of Key Characteristics</i>	
Critical and innovative thinking	Creativity, entrepreneurship, resourcefulness, Application, skills, reflective thinking, reasoned decision-making	Thinking Skills–self awareness, Problem solving, Critical thinking, Dealing with stress, creative thinking

<i>Domains</i>	<i>UNESCO</i>	
	<i>Examples of Key Characteristics</i>	
		<i>CBSE</i>
Interpersonal Skills	Presentation and communication skills, leadership, organizational skills, teamwork, collaboration, initiative, sociability, collegiality	Social Skills –interpersonal relationships, effective communication, empathy etc.
Intrapersonal Skills	Self discipline, enthusiasm, perseverance, Self motivation, compassion, integrity, Commitment	Emotional skills–managing feelings/emotions, dealing with Stress etc.
Global Citizenship	Awareness, tolerance, openness, respect for diversity, intercultural understanding, ability to resolve conflicts, civic/political participation, conflict resolution, respect for the environment	Affiliation with organizations Like National Cadet Corps, Red Cross, Scouts and Guides etc. as part of school co-curricular Activities is encouraged
<i>Optional</i>		
Physical and psychological health	Healthy lifestyle, healthy feeding, physical fitness, empathy, self respect	Yoga and Health programs; Nutrition programs at Elementary stage

(Cited from Integrating Transversal Competencies in Education Policy and Practice; Country Case study, Republic of India, Asia-Pacific Education Research Institutes Network.)

Borghous et.al. (2008) defined non-cognitive skills as patterns of thoughts, feeling and behaviour which includes critical thinking skills, problem solving skills, emotional health skills, social skills, work ethic and community responsibility. Similarly, Crawford et.al. (2011) defined non-cognitive skills as a range of skills varying from time management to leadership and teamwork, knowing thyself and self management. Researchers have marked a relation between non-cognitive and cognitive skills required in various disciplines. Bewels and Ginits (1926) argued primarily that cognitive skills carry more weightage in comparison to non-cognitive skills to determine school and employment success followed by Heckman et.al. (2006) who agreed with the same.

Glover (1991) examined the nature of relationship between cognitive (High school GPA and SAT Score) and non-cognitive factors (self esteem, self concept of ability and social isolation) of 40 black, 33 other minority and 117 white nursing students. Research revealed that self concept, self esteem and SAT scores were the major predictors of academic success of total sample. However for black and other minority nursing students high school grade point average was the predictor

of academic success and self concept of ability also come out to be the predictor in case of black students. On the similar lines Kinavey (1994) studied the relationship of non academic variable namely self concept, coping ability and social support and achievement of minority nursing students and found insignificant relationship between the two.

Further, Ting (2003) predicted the academic success of first generation students by examining eight non-cognitive variables, (positive self concept, realistic self appraisal system, demonstrated community service, knowledge acquired in field, preference of long range goals over short and immediate goals and ability to defer gratification to attain goals, ability to deal with racism and availability of strong support person) and found that non cognitive variables were better indicators of continuing enrolment and GPA of students and specifically in case of students of colours in comparison to Caucasians. Adebayo (2008) on the other hand conducted a study to determine the extent to which both cognitive non-cognitive variables predict academic success for conditionally admitted freshman students. Results showed that one cognitive variables *i.e.* high school GPA and two non-cognitive variables *i.e.* realistic self appraisal and understanding and coping with realism were the three best predictors of these students.

Okagarki and Sternberg (2008) investigated about child nurturing, curriculum to be taught to first and second grade children and characteristics of an intelligent child from emigrant parents from various other countries to America. Parents from all other groups but for Anglo-Americans felt that non-cognitive skills are of same or more relevance than cognitive skills and added to their idea of intelligent child.

Heckman (2008) discussed the role of cognitive and non-cognitive skills in shaping adult outcome and highlighted that family environment of young children is a major predictor of cognitive and socio-emotional abilities. It was further explored that the children who have non-cognitive skills now will have better prospects in education and labour market. Further, Cunha and Heckman (2008) while estimating the models of evolution of cognitive and non-cognitive skills examined the role of family event in shaping these skills in different stages of child. They founded that family contributions are helpful in raising non-cognitive skills among students. Also they found that non-cognitive skills facilitate the formation of cognitive skills but vice versa is not true. Further they concluded that family inputs have major role in shaping these skills among students with cognitive skills at early ages and non-cognitive skills in the later stages of life. On the other hand, Burnello and Schlotter (2011) reviewed the literature on relevance of cognitive and non-cognitive skills in economic and industry outcomes in Europe. The literature evidenced that student motivation and his personality traits contribute in school achievement alongwith the cognitive skills. Further, the literature emphasized the importance of non-cognitive skills in school attainment and labour market outcomes as of cognitive skills.

Kyollnen et. al. (2011) while studying graduate students identified the role of non-cognitive skills for admission to the program and outcome of the study. He further concluded that there is not a single skill rather a combination of interrelated key skills which needs to be developed among students such persistence, independence, creativity and good values. In continuation to this, Huang (2011) after a meta analysis selected three non-cognitive drivers of academic performance apart from their prior academic success. The three drivers were academic self efficacy, academic motivation and student engagement and a scale was constructed to assess these skills among college student. It was concluded from the study that these skills were significant predictor of college GPA of the students when their prior academic success was not taken into consideration and results were reversed when it was considered. So it could be interpreted that non-cognitive skills are proxies of academic success of students to some extent. On the contrary, Schauer. et.al (2011) analysed the role of eight non-cognitive factors (William Sedlacke's non cognitive factors-positive self concept, realistic self appraisal system, demonstrated community service, knowledge acquired in field, preference of long range goals over short and immediate goals and ability to defer gratification to attain goals, ability to deal with racism and availability of strong support person) in predicting academic success of 127 minority students in historically black university and determined non-cognitive skills as weak predictors of success rate of students in comparison to their high school GPA which comes out be the best prediction of their academic success.

On contrary to this, Ransinghe (2012) explored the role of non cognitive skills and social and demographic characteristics in determining the college success of 90 recently graduate students stratified as high and low achievers. High achievers demonstrated a significant higher mean score on positive self concept, confidence, realistic self appraisal, leadership, preference of long range goals and academic familiarity and all these non cognitive skills significantly increased the chance of obtaining their honours degree alongwith various socio-demographic factors.

Sparkman et.al. (2012) took into account 15 emotional dispositions with components self-regard, optimism, social responsibility, emotional self awareness, self-actualization, flexibility, empathy, independence, stress tolerance, impulse control, interpersonal relationship, assertiveness, reality testing, problem solving and happiness as non-cognitive predictors of college student's success. Using multivariate test of differences between groups they found that groups were statistically differing only on four factors *i.e.* empathy, social responsibility, flexibility and impulse control. The discriminant analysis was conducted to determine the differences among not enrolled, enrolled or graduated after years from their initial enrolment. Canonical correlation for this dimensions indicated significant difference among

these groups predominantly on self actualization, happiness, optimism, problem solving, assertiveness, stress tolerance with impulse control, social responsibility, empathy, flexibility, interpersonal relationship, as the strongest predictors. Further applying regression it was found out that linear continuation of five factors namely self actualization, happiness, social responsibility and independence interpersonal relationship statistically significantly predicted the CGPA of graduated students with social responsibility as the strongest predictor and happiness as the weakest. Moreover, it was analysed that self actualization, social responsibility and happiness were the positive predictors and rest two were the negative predictor of student's success. Again, Kyllonen (2012) studied the non-cognitive skills in relation to educational success of college students and revealed that adding non-cognitive assessments in cognitive assessment leads to better performance students and a diverse cohort. Furthermore, adding non-cognitive assessment while placement assessment of higher education students leads to more accurate assessments.

Gutman and Schoon (2013) in their research on non-cognitive skills explored that these skills have impact on positive outcomes of young people. They found out that self control and school engagement have impact on the academic outcomes, financial stability of the person and reduced crime. Further they concluded that perception of children about their ability, their future expectations and extent of valuing an activity influence their motivation and persistence ultimately leading to improved academic outcome especially for low attaining students. But researcher does not assure about long term input of non-cognitive skills on outcomes. On contrary, Kautz (2014) in its review paper highlighted that non-cognitive skills predict later life outcome with the same or greater strength as measures of cognition and concluded that these skills impact the life of a beyond schooling also. Evaluating the studies on intervention program researcher concluded that children get more benefit from interventions programmes in early childhood, elementary schooling and adolescent age that target non-cognitive skills in comparison to the programmes that target academic learning and cognition.

Zlatko & Ajiwad (2014) further conducted a study in Tajikistan and Uzbekistan and shown the association of both cognitive and non-cognitive skills with industry outcomes and also revealed that type of the job is also influenced by these skills. Study further concluded the strong association of non-cognitive skills with job satisfaction, higher wages and hence labour productivity in comparison to the skills acquired in formal education.

Concluding the above review it is clearly evident that most of the studies done on non-cognitive skills are taking a few non-cognitive skills at a time and concluding their impact on achievement, employability and better life. None of the studies have taken the non-cognitive skills as a whole and also the specific skills set determining

the skill requirement to enter in a particular area of knowledge is not explored. Review supported that non cognitive skills are necessary for academic success and employability, so to enable students make wise selection while entering into particular profession and also directing employers to employ fully skilled personnel to enhance the productivity and hence GDP of a country this study will provide a substrate to students, parents, institutional administrations and employers.

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