

A Study to Promote Students' Non-cognitive Ability——Based on Educational Psychology Theory

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Keywords: Educational psychology; Non-cognitive ability; Scholastic achievement

Abstract: In recent years, some specific non-cognitive abilities gradually attract the attention of the education circle, including curiosity, self-management ability, adaptability to changes, conscientiousness, flexibility, and the ability to cooperate with heterogenous partners effectively. These non-cognitive abilities as the key skills that the students will need in society can not only affect their school records and education choices during their teenage, but also exert an influence on their longer-term performance and living quality after graduation. Presently, people have reached a consensus on the importance and cultivability of non-cognitive skills, and a series of education revolutions have been triggered internationally. Under this background, how to improve the students' non-cognitive abilities becomes the research focus of this paper. The paper combed the concept of non-cognitive abilities, reviewed and analyzed the non-cognitive ability factors that can affect scholastic achievement, and put forward relevant suggestions.

1. Introduction

As the age of intelligence arrives, knowledge production alternates continuously. In future, almost every industry needs graduates mastering multiple skills. In a joint declaration of the Council of Distinguished Scientists made on September 2017, it pointed out that non-cognitive skills were essential for people in school, workplace, family and community, which could be cultivated and developed during childhood, teenage and even after that, and school education can play an important role in cultivating these non-cognitive abilities. The paper combed the concept of non-cognitive abilities, reviewed and analyzed the non-cognitive ability factors that can affect scholastic achievement, and put forward relevant suggestions.

2. What is non-cognitive ability?

Non-cognitive ability refers to some personality characteristics of individuals like ability of social communication, self-esteem, and so on, which are apart from dominant human capital like education background, years of working, work experience, technical level and cognitive competence. These personality characteristics are factors irrelevant to cognitive competence. Roberts (2007) described them as a permanent mode of personal feeling, idea and behavior [1]. Heckman and Rubinstein (2001) discovered that though people holding GED certificate had the

same cognitive competence with high school graduates, the former earned a salary significantly lower than the latter, almost the same with high school dropouts, and this was because the employers insisted that the non-cognitive ability of GED holders was lower than that of high school graduates [2]; Schoellman (2016) found that after adding in non-cognitive abilities, the human capital increased the explanation of income gap by 10% [3]; Bowles (2001) considered that in labor market, non-cognitive factors can play a bigger part than cognitive factors [4].

With the development of personality psychology, the scholars of psychology can reasonably and effectively measure the non-cognitive factors including personality characteristics, preference, self-esteem, emotion stability by psychological scale or other methods, so the research of the factors influencing non-cognitive ability and the role of cognitive ability gradually rises in the academic circles. In current international community, the Five-Factor Model (FFM) is mainly used to build the measurement indexes of non-cognitive ability. The FFM model divides the personality characteristics of individuals into five parts: [5]

(1) Openness to experience: Individuals with high score on this normally have better imagination, curiosity and creativity, and are willing to break routine and accept new ideas.

(2) Conscientiousness: This index is used to measure whether an individual has the quality of concentration, logic, and conscientiousness in completing a task.

(3) Extroversion: The individuals with high score on extroversion are always more outgoing, enthusiastic and optimistic, and have strong social communication ability.

(4) Agreeableness: Individuals with agreeableness are often gentle and sympathetic, and keep peace with people.

(5) Neuroticism: Individuals with high score on neuroticism generally have good ability to self-regulate their emotions, are less over-sensitive and nervous, own strong sense of safety, and never feel sad or depressed in the face of stress.

The definition and connotation of non-cognitive abilities are shown in Table 1.

Table 1: Definition and connotation of five factors

Five factors	Definition (From the Dictionary of The American Psychological Association)	Connotation	Personality Characteristics
Openness to experience	A personality characteristic tending to accept new aesthetics and cultural idea	Imagination, aesthetics, ability to feel, action, idea, and value	Show deep understanding to art and aesthetics, willingness to try different activities, thirst for knowledge, and open values
Conscientiousness	A personality characteristic tending to be disciplined, responsible and hard-working	Competitiveness, execution, responsibility, logic, sense of achievement, self-discipline, and prudence	Be capable, wise, and fore-sighted, and have strong sense of responsibility and efficient cooperative ability
Extroversion	A personality characteristic tending to have active emotion and external exchanges	Enthusiasm, gregariousness, self-confidence, vigor, adventure, and activity	Be talkative and outgoing, like to contact with people, be filled with vigor, and often feel active emotion
Agreeableness	A personality characteristic tending to show harmony, generosity and unselfishness	Reliability, frankness, obedience, altruism, sympathy, and modesty	Be considerate, friendly, generous, and helpful, and willing to give up his/her own benefit for others
Neuroticism	A personality characteristic tending to show unstable mood and psychological confusion	Anxiety, depression, impulsiveness, and vulnerability	Tendency to negative mood, unstable emotion, and often feel anxious, afraid and shame

3. Non-cognitive ability factors affecting scholastic achievements

After 2000, the Educational Testing Service of America (ETS) initiated a large research task—Horizon project. This project devotes to improving the reliability and validity of recruitment and examination, and providing scientific basis for the selection of applicants. Based on this, some ETS researchers have built connection with relevant research institutions to carry out series researches together.

Walpole et al. discovered from a depth interview on the students of graduate record examination (GRE) that the variables that can be used to forecast the scholastic achievements of graduates contain: interpersonal competence, communication ability, perseverance, personality, and values (including openness, honesty, and trustworthiness) as well as conscientiousness. But till now, these variables haven't been measured by GRE effectively [6].

In 2012, Kyllonen et al. proposed to investigate the non-cognitive ability of examinee, including: (1) creativity; (2) communication skills; (3) teamwork; (4) perseverance and tenacity; (5) planning and organization ability; (6) morality and integrity. In the same year, the Council of Graduate Schools of America issued a report—The Path Forward: The Future of Graduate Education, which referred above abilities as Soft Skills and raised that attaching importance to the cultivation and investigation of “soft skills” could help graduates to better adapt to market needs.

Beside of ETS researchers, Sedlacek, a famous scholar in the research field of non-cognitive abilities, had brought forward eight non-cognitive abilities of higher education field (as shown in Table 2) in his monograph *Defeat a Challenge: Non-cognitive Evaluation of Higher Education Field* published in 2005. His view had been included in the third edition of International Encyclopedia of Education published in 2010.

Table 2: Eight non-cognitive abilities proposed by Sedlacek

S/N	Variables	Connotation
1	Active view of individual	Behave to be self-confident, firm, decisive, and independent
2	Realistic self-assessment	Know and accept his/her own advantage and disadvantage, and devote to personal development, particularly in academy; Know the necessity of personality development
3	Know how to deal with racial problem	Form a realistic view of race system based on personal race experience; devote to raising solution to existing wrong race system, which is feasible without resulting in social harm; have the ability to solve racial discrimination
4	Not limit to a short-term need, but have a long-term vision	Not soak in previous achievements, and can arrange and make plans before time
5	Can find a strong supporter	Own a strong social network; can obtain courage and support from others when in trouble
6	Successful leadership experience	Display strong leadership capability in a certain field
7	Community service capability	Participate and fuse in the community
8	Ability of acquiring knowledge in a certain field	Can continuously obtain knowledge in a certain field

Combined with existing studies, this paper concludes the non-cognitive abilities that can affect scholastic achievements as seven points: (1) Communication ability, that's an ability to share knowledge with tutors and peers, express personal idea clearly and wisely in various scenarios, and listen to others and master the key information; (2) Planning ability, that's an ability enabling one to make academic goal, and seek support and allocate resources to realize such goal; (3) Social adaptiveness, that's a ability of adapting oneself to surrounding environment, and dealing with an unbalanced state met in study and life; (4) Conscientiousness, which refers to an attitude that one can conscientiously take charge of his/her study and work; (5) Interpersonal communication, that's an ability of communicating with tutor and people of academic team; (6) Leadership, that's an ability of encouraging people, acting as a team representative, and serving as a managerial role; (7) Teamwork capability, that's an ability of cooperating with others to complete all tasks; (8) Self-motivated learning motivation, which refers to studying motivated by a thirst for knowledge and an interest of exploration.

4. Suggestions for improving students' non-cognitive ability

4.1 Set cooperative study program based on peer effects

Peer effects are the interaction between students in performance, preference and behavior, and it is also a hot direction in the study of education field. The existence of peer effects has been widely validated by the studies of difference countries based on different methods and for different aspects. It is the influence on individual educational development and achievements from all external factors of the peers such as background, capability and behavior, which can not only significantly affect a student's scholastic performance and behavior pattern but also unconsciously change his/her non-cognitive ability such as self control. Peer, as an important input variable in educational production function, has been explored by scholars in many ways for its role in the capability output of youths. Some studies have indicated that good peers can facilitate the development of the youths' non-cognitive ability. When most good friends are hard-working or willing to study in top university, these will produce significant positive impact on the youths' extroversion, agreeableness, openness and conscientiousness, and significantly reduce the youths' neuroticism.

On basis of peer effects, it is feasible to set cooperative program, provide students an opportunity to study and work with others, and push them to listen to others' opinion on the questions carefully, especially the opinion of those with different social background and experience, so as to cultivate them to have an inclusive attitude on multiple ideas. This method has been widely used in course group study, teamwork and joint program research.

4.2 Shift of family education mode

At the family level, parents should pay attention to the development of children's non-cognitive ability in the course of education, and both the economic and time input of a family on education will promote the children's non-cognitive ability through improving the children's education level expectation and learning attitude. Specifically, if the parents input more money, time and energy on education of children, on one hand, it will realize the regeneration of the parents' cultural and value idea and enable the children to have higher education expectation in future; on the other hand, the companion and communication between parents and children can make the children to realize the importance of study, and a higher learning expectation and correct learning attitude will make the children to possess higher non-cognitive abilities. However, if the parents pay excessive attention to children's grade and performance in school, though this can increase their ability to take tests and doing exercises, this will also affect their development of emotional quotient factors relevant to

getting along with people, communicating with people and stress relief. These EQ factors could not only affect the current performance of children but also will produce an influence on their future development, because active attitude like insistence, perseverance and self-confidence can help students to have a good attitude toward study and fuse in the learning atmosphere in school.

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