

Self-Cultivation Methodology of Engineering Students and Its Application in the NEW ERA

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Abstract—In the New Era of Socialism with Chinese Characteristics, engineering college students face the practical needs of further improving their service will and capability. Self-cultivation can help this goal, because it has special advantages such as considering the student's internal world comprehensively, gradually cultivating moral qualities, and making students improve themselves as they wish, only if it is done faithfully and wholeheartedly. Therefore, based on practical experience, by integrating relevant theories and methods of the traditional Chinese culture excellence, Marxist philosophy, and psychology, we have established a modern methodology of the self-cultivation system for engineering college students, which taking a closed loop of self-perception and practice-testing as its core. This methodology starts from ideological concepts tested by long Chinese history, takes the improvement of physical, mental, academic, and social relations as the testing goal, and with method of guide-but-not-push, to promote the overall moral and humanistic quality of students. The application of this methodology has benefited both teachers and students, which will also expedite the creative transformation and innovative development of traditional Chinese culture excellence.

Keywords—Self-Cultivation; the NEW ERA; Engineering Students; traditional Chinese culture excellence; Practice Testing

I. INTRODUCTION

When entering the new era of socialism with Chinese characteristics, higher education of China has opened a new stage of connotative development. Since the Ministry of Education launched the "Emerging Engineering Education (3E)" on February 20, 2017, the "Six Excellence and One Top-notch" Plan 2.0 which includes 3E was also launched in Tianjin on April 29, 2019. In June 2016, China officially joined the Washington Accord of engineering educational qualifications and professional competence. The engineering certification major implements the concepts of Student-centered, Outcome-based, and Continuous Improvement, and comprehensively promotes the quality of engineering professional talent and talent training.

The 3E and International Engineering Education Accords put forward higher requirements on engineering students' service will and service capability. Service will make students to embrace strong awareness to serve people wholeheartedly, which is a prerequisite for college students becoming people well-prepared to join the socialist cause. While service capabilities make students to master techniques to serve the

people, which will secure their service awareness. Whether it is Service will or capability, both of them are results of conscious growth of individual college student combining morality and psychology, under the external environment of family, school and society. At this point, the method of self-cultivation will help a lot, which is a vital part of traditional Chinese culture excellence. This is discussed below.

II. SELF-CULTIVATION IN THE NEW ERA

Self-cultivation is one of the core contents of traditional Chinese culture excellence, which has always been valued. There is a saying in *The Great Learning*: "From the Son of Heaven down to the mass of the people, all must consider the cultivation of the person the root of everything besides." For the significance of self-cultivation under the new historical conditions, Wang Xinzhu from China University of Political Science and Law thinks that self-cultivation has profound modern value [1]; Yang Hui from Heilongjiang Institute of Technology points out that we should carry forward the excellent traditional Chinese morality with Confucian ethics as the core, and promote the creative evolution and development of fine traditional Chinese culture [2]; Jiang Xiyu of Shandong University says, self-cultivation is the root of moral education in China [3]. Therefore, self-cultivation, as a practice process of individual physical, mental and moral development, which is characterized by moral self-discipline, should be vigorously promoted in the New Era.

A. Definition of Self-cultivation in the New Era

Self-cultivation is so important and is being continuously valued, but from ancient classics to modern research literature, it is difficult to find a precise definition of it. The Xinhua Dictionary interprets self-cultivation as: "Cultivating body and mind, and cultivating virtue." Du Zhenji from Qufu Normal University has defined self-cultivation as "moral cultivation and personality self-improvement" [4]. Wang Nanfang from Wuhan University, explained self-cultivation as "self-moral cultivation" [5].

The author believes that self-cultivation, as a conscious action of enhancing oneself morality, temperament, lenience, and physical and mental health, should and can be interpreted through Marxist epistemology and practical theory, and can be incorporated into the theoretical framework of Marxist philosophy. In addition, self-cultivation has so strong

connections to human psychology that views and practices of psychology should be introduced. Therefore, according to the essential characteristics of self-cultivation, the self-cultivation in the New Era is defined as:

Self-cultivation is a self-conscious moral practice in which social individuals take the initiative to understand and transform their inner subjective world based on objective laws, so that their thoughts, speech, and behavior are highly consistent with the objective laws.

B. Characteristics of Self-cultivation in the New Era

According to the content and methods of traditional self-cultivation, combined with Marxist philosophy and psychology, it is concluded that self-cultivation in the New Era has the following characteristics:

1) *Objective law determined.* Self-cultivation, as a systematic method of understanding and transforming the subjective world, must be based on nature law of both the objective (external) world and the subjective (internal) world. It can be manifested through internal self-practice test such as mental or physical improvement, or through external practice test such as better relationship with other as changing thoughts, words or deeds. Self-cultivation is to follow the Tao, as which is told in Tao De Thing: "Man takes his law from the Earth; the Earth takes its law from Heaven; Heaven takes its law from the Tao. The law of the Tao is its being what it is."

2) *Self-directing.* Self-cultivation is the practice process in which the subject actively initiates and persistently transforms his subjective world based on his own and social needs. It is to amend oneself, to "be watchful when alone" (*The Great Learning*), and to "practice perfect virtue from himself" (*The Analects of Confucius*). Self-cultivation is self-improvement in a way of unity of knowledge and action, and the progress, process and results are controlled by oneself.

3) *Systematicity.* Self-cultivation is a systematic transformation of the subject's own subjective world, including worldview, outlook on life, and values, covering cognition, motivation, feeling, emotion, temperament, personality, capability, involving the entire psychological system. At the same time, body and mind are considered as one, and self-cultivation requires a comprehensive consideration of the Physiological and psychological system. In addition, self-cultivation should take the social and material surroundings of social individuals into account.

4) *Practice testability.* The object of self-cultivation is the whole inner subjective world of an individual. Although there are classics and theoretical reference guidance, whether the ways, methods, and routes of self-cultivation are correct and effective must eventually be tested in different circumstances, such as whether the heart is more peaceful, whether the body is healthier, whether the family is more harmonious, whether the work is more effective, whether the social relations are smoother, etc..

5) *Sustainability.* Self-cultivation requires uninterrupted long-term persistence, and make this habits natural. The

correction of the individual consciousness system is very difficult, so it should be non-stop like eating and breathing every day. In particular, the developing of temperament and good character requires the effort of "cutting down a wood by sawing rope, drilling through a stone by falling drop".

6) *Environmental dependence.* Environment and role models play an important role in self-cultivation. With a good environment and a good tutor, you can "do twice the result with half the effort", otherwise it is easy to "work hard but no good results". Therefore, it advocates "environmental education" and "teaching by personal examples".

III. THE VALUE AND METHODOLOGY OF SELF-CULTIVATION FOR ENGINEERING COLLEGE STUDENTS IN THE NEW ERA

Advocating engineering college students to self-cultivate is not only because the needs of social individual development, but also because the fostering need of them according to the law of students develop.

Self-cultivation is the inner developing need of every social citizen. *The Doctrine of the Mean* says: "the Noble Man cannot but cultivate his character." "Suggestions on Implementation of Projects to Promote and Develop Traditional Chinese Culture Excellence" promote the creative evolution and development of fine traditional Chinese culture in the New Era, which take self-cultivation an important part of it. Fang Niangen and Dai Litong of Zhejiang Chinese Medical University has conducted a survey on Self-cultivation of college students in September 2016, which showing that 89.12% of interviewee choose "very willing" or "basically willing" to participate in the college students' self-cultivation education activities [6].

A. The Necessity of Engineering Students' Self-cultivation

Self-cultivation is of great benefit to the comprehensive cultivation of the abilities and moral qualities of engineering college students in the New Era. Try to describe as follows:

1) *The Systematicity of self-cultivation meets the unified fostering requirements of students' subjective world.* The inner world of a person's ideology, motivation, attitude, emotion, intellect, capability, language, and behavior, etc. is a unified whole, and each component affects and interacts with each other. For example, when in the face of the same social material environment, different ideas and concepts will lead to different motives and attitudes, which will produce different emotions, words, and behaviors; emotions and intellectual abilities not only affect each other, but are also affected by ideas and concepts. Engineering students' service will and service ability are also unified: A person with a service will can produce a strong power and motivation, which will actively improve his service ability; while the enhancement of service ability will increase his confidence and change his concept, which will further enhance service will.

In order to reveal this kind of uniformity, in March 2019, the authors have conducted a Minnesota Multiphasic Personality Inventory (MMPI) among about 170 students in three grades of transportation engineering majority of Kunming

University of Science and Technology(KUST). The survey has manifested that students with poor performance and poor scores always show relatively poor psychological indicators, while students with stable academic performance and calm personality often have better psychological indicators.

2) *The order of self-cultivation conforms to the gradual promoting progress of engineering students' moral.* A person's development and growth process is a process of gradually expanding the focus of attention and the scope of concerning, while thoughts and cognition gradually also change from concrete to abstract, from local to global, from the present to the diachronic. Things that can experienced and mastered are also extended from close related to unrelated, from near too far. Actually, the ancients saw clearly in *The Great Learning* as: "Their hearts being rectified, their persons were cultivated. Their persons being cultivated, their families were regulated. Their families being regulated; their states were rightly governed. Their states being rightly governed, the whole kingdom was made tranquil and happy." Mencius also said in *Mengzi*: "He is affectionate to his parents, and exercises benevolence to people generally. He exercises benevolence to people generally, and is loving to creatures." So, the cultivation of students' moral qualities should also follow this law, expand and deepen gradually, and start from things that they are easy to experience and understand.

3) *Self-cultivation takes advantage of the proactivity or self-directing of a college student to develop his own subjective world.*

It is revealed by Marxist philosophy that social individuals have creative initiative. As Maslow's Hierarchy of Needs showed everyone has need of Esteem and Self-actualization, which means a person would be more willing to grow up independently. Furthermore, the unique growth environment and individual psychology of social individuals determine that moral fostering should vary from person to person, and there is no universal model. Therefore, engineering college students are often proactive and active in the process of their growing up and maturing, and they are the masters of their own growth.

So, ancient Chinese Saints told us in *Xueji of Book of Rites* as: "He leads and does not drag; he strengthens and does not discourage; he opens the way but does not conduct to the end." The cultivation of moral character of college students should emphasize the concepts that Engineering education certification advocates-- Student-centered, Outcome-based, which means students will take more initiatives on their development.

B. Self-cultivation System of Engineering Students

According to characteristics and knowledge about self-cultivate presented above, a system of engineering college students self-cultivation is established as shown in Fig. 1. Through ways that can be experienced in ordinary lives, students are nurtured with correct world-outlook, outlook on life, and values, and shaped as healthy, positive, dedicated, responsible, Cooperative, and compassionate social individuals.

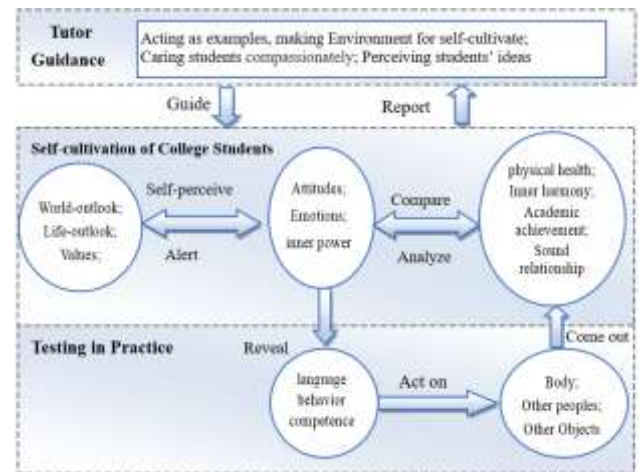


Fig. 1. The system architecture of self-cultivation.

The key to this self-cultivation system is to create a closed loop in which individuals can self-verify their practice. Through speech teaching, personal teaching and environmental teaching, students are put into self-cultivation motion using benevolence without denial, and keep tracking changes of inner world. First of all, making them be confident in right outlooks and values, and be willing to modify their ideas that not appropriate. After that, students are instructed to be aware of their attitudes, emotions, and inner power status. And then let them keeping their eyes on their languages, behaviors and capabilities when facing their body, foreign objects and other peoples. Guide them to persist in using verified concepts and attitudes to deal with foreign objects, keep tracking the corresponding results in their own physical, psychological, academic, and external interpersonal relationships, and analysis the changes of physical and mental health, academic progress, and interpersonal relationships before and after their concepts or attitudes modifying. Through a few closed-loop feedbacks, students will have tangible benefits, and naturally are willing to accept the correct objective laws and develop the habit of consciously acting in accordance with the objective laws. The student then becomes the master of his own life.

The main points of engineering students' self-cultivation are as follows:

1) *Should be Led and guided by self-cultivation teachers.* *Xueji of Book of Rites* has a saying: "He who gives (only) the learning supplied by his memory in conversations is not fit to be a master." Self-cultivation requires a teacher who already have unified his knowledge with his action to guide and set as an example, which make students to admire and have confidence in him. Only when students really want to learn from a teacher, will they concentrate and be benefited. Otherwise they will just take a shape and have no respect to the teacher. A well-cultivated teacher will be more patient and cares students wholeheartedly, and make students feel this kind of caring. Also a teacher with self-cultivation experience understand that students are not good or bad in essence, but be diversified by different fostering process, and everyone can change for the better. In addition, this kind of teacher has

mastered the methods and essentials of self-cultivation, and guides students on self-perceiving and adjusting of their outlooks, emotions, attitudes, behaviors, and so on. All this can pave way for students to accept themselves completely and take full advantages of self-cultivation.

2) *Master the method of distinguishing the self-as-subject (or subject self), self-as-object (or object self) and objects, and learn to self-perceiving.* Self-cultivation is an introspective effort, a process of self-perception, self-supervision and self-correction. The subject who implements supervision, perception, and correction is the subject self, the object being supervised, perceived, and modified of our inner world is the object self, and the world faced by a self-cultivator is the objects. Objects include internal objects and external objects. Internal object are their own bodies. External objects consist of other social individuals, events that need to be handled, and the surrounding material and environment. Object self is the ideology of the self-cultivator (world outlook, life outlook, values), motivation and will (power), attitude towards the objects, emotional experience, etc. The subject corresponding to the object includes the subject self and the object self, which together constitute the subjective world of a social individual and the mental part of a person. The subject exerts influence on the external object in the form of languages and behaviors under the perception and supervision of the self-as-subject, and shows the corresponding intelligence and capability.

Distinguishing the self-as-subject is the key to self-cultivation, because only in this way can self-as-object be recognized as objects to be cultivated. The conscious part, the activist--that knows what one is thinking, saying, doing, and where is the pain is from--is the subject self.

3) *Master the way of testing self-cultivation in practice based on self-perception and environmental interaction.* Another key to self-cultivation is the practice test, that is, to judge whether the concepts, methods, and the steps taken when self-cultivating are correct through the improvement of physical and mental health, and the relationship with external world. The main point to the test is not to judge whether the historically tested viewpoints in the Chinese excellent traditional culture are correct, but to see whether they are practiced in full faith, in perseverance, and in proper way. If one suspected classics that have been tested for thousands of years, he will not conduct it with full effort, and he cannot win obvious effects.

4) *Learn to self-Cultivate anytime and anywhere.* Self-cultivation is the perceiving, adjusting and promoting activities of the inner subjective world, which can be carried out in any place and at any moment. The key is to develop this consciousness and cultivate this habit. When one doesn't need to focus on an intelligence-concentrated task, such as time walking, eating, chatting, or taking a break, learn to pull yourself back to reality instead of letting your thoughts fly in the sky. One should live at the present moment, letting himself be aware of subject self, and be aware of his current state of

the body, emotions, thinking, language, behavior, etc., and letting himself cultivate on purpose attitudes as inclusivity, gratitude, responsibility, benevolence, humility and other mentality.

IV. PERSPECTIVE CAN BE EXPERIENCED IN LIVES FOR SELF-CULTIVATION

The five major relationships that each individual needs to deal with are: relationships between self and his own body and mind, between self and other peoples, between others peoples, between self and foreign objects, and between foreign objects. If acting according to the laws of them, one can feel free. The following gives the ideological ideas contained in the classics such as *I Ching*, *Tao De Thing*, *The Great Learning*, *Doctrine of the Mean*, *The Analects of Confucius*, which are consistent with Marxist philosophy and need to be tested on oneself in practice.

A. *Universal Connection of Things—"One"*

The world was one rational system and everything was interconnected. Correspondingly, Chinese highlight the "One", such as "body and soul is one", "self and others is one", "all substance is one", "mind and matter is one". "One" means universal connection, looking at the world without isolation and separation. Any matter is in some system. The matter itself is also as a system. Professor Han Xing of the Renmin University of China pointed out that the mainstream form of Confucian body view is the integration of body and mind, with the mind as the master, and the highest state of self-cultivation is uniting with the Tao as one [7].

To deal with the relationship between body and mind of oneself: keep one in mind. One should make clear that the body is a physical entity, the mind is an inner subjective and psychological system, and that he should make the best use of himself. The body's feeling of cold and warm, hungry and full, pain or relieved will affect the psychological state. Individual thoughts can affect his attitude and emotion, which will have great influence on his physical and mental health, and then on his behavior. In real life, the psychological self will be constrained by the physical self, but the psychological self can also largely control the physical self. A successful people can make good use of and dominate his physical self, by being active, diligent, courageous, and generous, and constantly surpassing themselves and changing their destiny. The saying from *Huangdi Neijing*: "When essence and spirit are guarded internally, where could a disease come from?" is the specific portrayal of psychological influence on the body. This interaction and connection between body and mind is the basis of self-cultivation.

To deal with the relationship between self and other, including self and other people, self and other things: always take the initiative. The self and the external people and things are in one system--a shared ecosystem, in which there is no situation other than win-win or lose-lose in a long run. Selfishness is self-benefited locally and for a short period of time, but in the long run, it must be self-defeating. In this one-other systems, one can only benefit if he becomes an initiative and benefit the system as a whole. *The Analects of Confucius*

has a saying: “What the superior man seeks, is in himself. What the mean man seeks, is in others.” Which told us, when faced with other people, matter and things, one should always be alert: he is the master, he is the key to influence or alter it. The saying of Mencius “If in any action there is a failing, seek it out within yourself.” emphasize that one must make a difference and seize the initiative.

To deal with the relationship between others, including between other peoples, other people and other things, and things: act as an example and according to natural laws. When one handles relationships between others, then he also is part of that system. Setting an example and following the right natural way is the way to deal with the relationship between others and other things. Confucius has told us: “When a prince’s personal conduct is correct, his government is effective without the issuing of orders. If his personal conduct is not correct, he may issue orders, but they will not be followed.” He also said: “If they be led by virtue, and uniformity sought to be given them by the rules of propriety, they will have the sense of shame, and moreover will become good.” The existing professional disciplines of science and technology are used to deal with the relationship between other things, using science and technology to serve people.

Based on the system theory of “one”, Chinese advocate “harmony” and “benevolence”. There are sayings, “In practicing the rules of propriety, it is harmony that is prized”, “Harmony in a family makes everything successful.” When Chinese people regard the Unity of opposites, they value the relationship of mutual dependence and mutual promotion, and protect their own interests by maintaining the interests of the other party; they are willing to struggle externally instead of internally, and obtain common resources that benefit each other’s growth from the surroundings. They can overlook self and internal contradictions, considering a larger system but not a small one, even to build of a community with a shared future for mankind. Based on this wisdom, advocate peace or harmony, and benevolence or kindheartedness.

Extension of benevolence (仁). Benevolence, taking two people (self and another) into account simultaneously, which means one should treat others in the way he treats himself. So just like one he will accept himself anyway, he should accept others, even learn to accept all things. Thus he should be inclusive or be able to accept (容) other person, things, matter. One cannot always be perfect, so he should let other be so. That he need to forgive (恕), which means “What you do not want done to yourself, do not do to others (The Analects of Confucius).” Everyone has weaknesses, thus one ought to be modest (谦). No one can survive without others and social and natural resources, so he should always be grateful (感恩). Furthermore, one need to be treated correctly and reasonably by others, so he should to think about “filial piety, loyalty, faithfulness, propriety, integrity, and sense of shame.” When it comes to a great men and sages, he can extend benevolence to state of No Self.

B. Eternal Development of Things—“Yi”

Yi (易), that is eternal development, all things are constantly keeping in occurring, developing, and changing, and

nothing can avoid the process of arising, residing, decaying, and vanishing. *I Ching*, the source of Chinese classics, fully demonstrates the mutability, simplicity, and invariability of all things in the world. *Tao Te Ching* make full use of variability, pointing out “So it is that existence and non-existence give birth the one to the other; that difficulty and ease produce the one the other; that length and shortness fashion out the one the figure of the other; that height and lowness arise from the contrast of the one with the other”. To follow *Yi*, we must accept eternal development, grasp the degree of things changing, and master the law of things.

Always bear eternal developing in mind. Matters develop eternally, but in reality, people like or are accustomed to seeing things with a static and one-sided perspective. They subconsciously hope that they and their foreign objects can be kept in a certain beautiful, comfortable, or as expected state, and what is not perfect and not welcome don’t appear. This runs counter to reality and is naturally won’t happen as they wish. For example, one hopes that he or his loved will never get sick, and he hopes that his classmates and teachers will always respect himself. Internalize the concept of the eternal development of things, no matter what happens, understand that all good things will become the past, and all bad things will also become the past, so as to “not pleased by external gains, not saddened by personal losses.”

Grasp the degree of things changing. Chinese ancients advocated the Golden Mean and highlight seizing the degree of developing. Through the controlling of internal and external causes, one should make things in a system developed to a proper dynamic balance state, and maximize the interests of multiple stakeholders. One ought to catch the opportunity and scale well in everything, leave room for everything, for knowing that things will change at qualitatively when reaching turning point.

Meanwhile, develop a habit of analyzing laws of things developing and changing, and insist on considering thing by combination of internal and external causes. When handling problems, one should start from the causes, and find solutions from the developing process. If conditions permitted, one change external causes, and adjust the development process, or alter the direction of things. If not, one has to accept without complaining, and prepare for another try or directing to another thing.

C. Two Aspects of Things

Everything has two aspects, so:

First of all, when we look at matters, we must be able to see the both aspects of it, knowing that there is no coin just one side, knowing “in yang there is yin; in yin there is yang”. Subconsciously, most individuals are accustomed to seeing the problem on one aspect, as saying in *The Great Learning*: “A man does not know the wickedness of his son; he does not know the richness of his growing corn.” It should be noted that everything has different aspects. When you look at anything, you need to see whether it is good or bad, beautiful and ugly, good and evil, and should make sense the saying from *Tao Te Ching*: “All in the world know the beauty of the beautiful, and in doing this they have (the idea of) what ugliness is; they all

know the skill of the skilful, and in doing this they have (the idea of) what they want of skill is.”

Secondly, it should be noted that nothing is good or bad in essence. What makes a thing better or worse is the individual's views and coping styles. If the method is wrong, the good things will become bad, and the bad things will be worse; otherwise, adversity will train people, and prosperity will boost them. Albert Ellis's ABC Model of psychology states this truth.

Besides, everything has the possibility and reality of mutual transformation through changing external causes. In Chinese classics, there is “Overflow when water is full, loss is caused if the moon is full”, “Extreme yin generates yang, and extreme yang generates yin”; and is “Complacency leads loss, modesty brings profit”; also is “When one is about to take an inspiration, he is sure to make a (previous) expiration; when he is going to weaken another, he will first strengthen him”; still there is “Firmness and strength are the concomitants of death; softness and weakness, the concomitants of life.”

Finally, we must see good nature of man. Self-cultivation is based on the nature of mind [8]. There are disputing of man nature as good, bad, and no good or no bad. But as self-cultivator himself, will not consider himself to be bad. Keep eyes on good nature, because: from the perspective of the One system theory, one emphasizes the good aspect but not bad; from the perspective of eternal development, on both aspects of good and bad, one look at the possibility and reality of transformation from bad to good; and from the perspective of individual's social motivation, no one will regard his motivation as bad, so does the others. Therefore, “people can be taught to be good”, “good people can be cultivated by proper education”, and education is to build morality and cultivate people.

V. APPLYING AND VALIDATING OF STUDENTS' SELF-CULTIVATION

Since September 2015, the author has worked as a class teacher in the Faculty of Transportation Engineering of Kunming University of Science and Technology, leading engineering students to carry out self-cultivation as trials. The goal is to improve students' moral qualities and inner power, rather than scores and abilities, with the slogan of “being themselves both inside and outside” for students. The work principle for teachers is caring wholeheartedly and communicating sincerely. Through monthly class meetings, weekly student individual interviews, QQ and WeChat group positive energy sharing, on-demand difficulty solving, classics co-learning, dispute adjusting, vacation homework and other working methods, help students recognize and adjust their own wrong ideas. In way of leading and does not dragging, guide students to learn to observe their own thoughts, emotions, attitudes, languages and behaviors, and the relationship between them, and to find out the connections between their inner subjective world and their body, parents, classmates, academics, etc. For example, the topics of holiday homework are “Shepherd in Life”, “My Thoughts and My Life”, “Companionship in my life”, “My Life Memoir” and so on.

For four years, the author grew with the students, sharing and enjoying their soul stories of academic achievements, life

development, parental relations, classmate relations, until they graduate. After four years, the author is more harmonious in his own heart. It seems that he is nourishing them with love, but in fact, he is being nourished himself. He seems to be helping them, but he is actually living out himself with more satisfaction with life. He wanted to illuminate the students with a bright light, but when turned around, found that himself had been illuminated before illuminating them. The students also gave the class teacher a good evaluation. In September 2018, he received an average work score of 97.8 for the class teacher, as well as the comment of “doing things silently that not everyone understands, but can benefit students a lot”. When a student who was facing a dropout several times has paid off all the money lent to him half a year after his graduation, the author decided to write this article.

In March 2019, in order to confirm the conjecture that students study conduction and achievements is closely related to their psychological characteristics, a MMPI applet was compiled used to conduct a survey of 170 students from 2015, 2016 and 2017 grades of traffic engineering major. Statistical results are showed in Table I, taking 60 as China's standard norm. As can be seen in Table I, the scales of grade 2015 are more balance. None of the maximum and minimum of all scales is from grade 2015. It can be seen from Table I that the scales depression, psychasthenia, and schizophrenia are significantly better than those of the other two grades. Hypochondriasis, hysteria and psychopathic deviate are slightly better than the other two grades. But the 2015 grade is slightly socially introverted. It can be seen from the index that the 2017 grade is better than the 2016 grade. In terms of study attitude, it can also be felt that the 2017 grade is better than the 2016 grade, so the influence of grade factors on the index can be ignored.

TABLE I. MMPI RESULT OF DIFFERENT GRADE

Item	Gra.	Hs ^a	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
Min.	2015	41	46	42	43	39	38	41	46	38	43
	2016	33	42	33	34	41	47	32	36	33	41
	2017	46	48	42	43	41	41	44	48	35	38
Max.	2015	77	84	78	86	73	67	83	84	75	68
	2016	95	101	89	88	86	91	93	119	91	86
	2017	85	99	86	88	73	97	107	119	88	77
Cov.	2015	9	11	9	10	9	7	9	9	9	7
	2016	11	12	11	11	9	10	13	16	12	10
	2017	8	11	8	10	7	10	13	15	11	10
Mean	2015	58	64	60	59	61	56	57	60	58	54
	2016	63	71	63	63	61	62	66	73	59	59
	2017	62	67	63	64	61	59	65	68	59	59

^a. Refer to https://en.wikipedia.org/wiki/Minnesota_Multiphasic_Personality_Inventory.

This survey not only proves the conjecture, but also proves the effectiveness of work done: the psychological scales of the grade that implemented self-cultivation are better than those of the other two grades. In fact, the teachers of transportation engineering generally believe that the study atmosphere of grade 2015 is obviously better than other grades. From the perspective of virtue fostering and students' physical and

mental health, the method in this article is effective and worth promoting.

VI. CONCLUSION

In fact, at the accepting the job of class teacher and starting to lead students to cultivate themselves, there is no methodology as conveyed above. The methodology in this article is gradually developed and perfected in the interaction with students, so naturally it is not a standard. But the work carried out by the author can prove that putting the self-cultivation into practice and really work, can definitely help students a great deal.

Advocating self-cultivation of engineering students conforms to the law of education. New challenges and the background of the New Era place higher demands for new engineering talents training. The core requirements are students' willingness and capability to serve, which requires students to have a responsible, dedicated, positive attitude to life and ample life motivation. To obtain such a life attitude and life motivation, it is necessary to give full play to students' initiative and make them be truly willing to modify their own thoughts with the correct world outlook, outlook on life and values, and apply them to study and ordinary lives. If students are willing to make corrections and can correct themselves, they need find and experience the value and significance of the correction, which can be done by an empirical closed loop. The

meaning of engineering students' self-cultivation is standing here.

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