

# Research and Practice of Innovative and Entrepreneurial Talent Training System in Local Colleges and Universities under the Background of Intelligent Era

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## Abstract

**Aiming at the problem of how to cultivate innovative and entrepreneurial talents (IET) in local colleges and universities under the background of the intelligent era, this paper analyzes the shortcomings of the existing training system that still fails to meet the training quality of IET under the background of the intelligent era. The authors further put forward a series of reform measures. The statistical result of the empirical study indicates that our research achievements are significant.**

## Keywords

**Innovation and entrepreneurship talent training; Intelligent age; Teaching research; Higher education.**

## 1. Introduction

The intelligent era is a new social development stage characterized by the popularization and application of smartphones, the rapid development of machine intelligence, big data, and the Internet of things, and widely serving people's learning, production, and life [1]. Intelligent technology reshapes the way of study, life, and work, greatly improves efficiency, and reshapes the world. The era of intelligence is an era of all-around great changes, which adds a decisive variable to the development and evolution of all aspects. With the advent of the intelligent era, the traditional IET training system is difficult to meet the social requirements for IET [2]. In years before the intelligent era, it was generally believed that education is equal to the accumulation of knowledge [3]. In other words, education is equivalent to imparting knowledge, mastering knowledge, and examining knowledge. In the era of intelligent, the increment and dissemination speed of human knowledge in a year is dozens of times that of previous years. Therefore, innovation and entrepreneurship education in the intelligent era is no longer just the accumulation of knowledge, and the evaluation index of innovation and entrepreneurship education is not only the assessment of memorizing knowledge [4]. The core of innovation and entrepreneurship education in the intelligent era is to cultivate learners' awareness of innovation and entrepreneurship, and have three abilities: the ability to acquire knowledge anytime and anywhere, the ability to make decisions on specific problems, and the innovation ability to solve practical problems [5].

Since China's education authorities have made important arrangements for the cultivation of innovative and entrepreneurial talents (IET) and put forward clear requirements for strengthening innovative and entrepreneurial education, colleges and universities across the country have successively carried out the construction of the IET training system. At present, local colleges and universities in China are the main body of colleges and universities [6]. They are different from the top universities in terms of teachers, quality of students, infrastructures, and social recognition, but they are different from higher vocational colleges. Therefore, the development of an IET training system cannot mechanically copy the solutions of other

universities but should be carried out in combination with the requirements of local economic development, the positioning of school, and resource endowment.

## 2. Problems

Taking our university as an example, the cultivation of IET has begun to take shape in terms of system arrangement and system construction. The college of innovation and entrepreneurship education has been established, equipped with part-time teachers (but mainly counselors), and a series of courses of innovation and entrepreneurship education have been set up. However, the existing training system still fails to meet the needs of the intelligent era. It is evidently summarized into the following six aspects.

(1) The educational concept is out of touch with the intelligent era, lacks the understanding of the essence of education, cannot timely modify the talent training mode with the pace of the times, and education lacks the cultivation of students' humanistic quality and innovative consciousness. (2) Innovation and entrepreneurship education is divorced from professional education, and cannot achieve effective integration. Innovation and entrepreneurship education is regarded as a "white elephant" course, which lacks the support of professional knowledge [7]. Innovation and entrepreneurship education easily fail to provide method guidance and thinking training for the teaching of professional education. (3) The teaching content and teaching mode are out of date. A considerable number of teachers' teaching contents are limited to the scope of textbooks, the teaching objectives are still based on knowledge memorization, and the teaching methods are still based on course teaching. (4) Students' ability to solve practical problems and innovative ability need to be further cultivated. (5) The talent assessment mechanism lacks the assessment of all-round comprehensive ability. In view of the above problems, guided by the demand for talents in the intelligent era, the author deeply studies the innovative and entrepreneurial talent training system of local colleges and Universities under the background of the intelligent era from the aspects of education mode, teacher team construction, curriculum system construction, learning platform and teaching means.

## 3. Related Research

The great strategic significance and educational value of innovation and entrepreneurship education have been widely concerned by researchers at home and abroad. How to effectively promote the development of innovation and entrepreneurship education and build a set of feasible implementation plan is a very urgent problem. Many scholars have studied the education system in the intelligent era. Zakieva et al proposed that the construction of a complete college students' innovative and entrepreneurial talent training system should be realized through the innovation of education system and the support of service system [8]. Through a questionnaire survey on the current situation of college students' innovation and entrepreneurship education mode, [9] proposed that we should closely follow the advantages of innovation and entrepreneurship environment in the intelligent era and build a relatively perfect innovation and entrepreneurship education mode. References [10-11] analyzed the positive and negative factors in the intelligent era and proposed that we should further improve the policy system, provide financial resources, innovate and entrepreneurship education, and improve intellectual property protection to support college students' entrepreneurship education. Based on questionnaires and personal interviews, Zhao et al analyzed the current situation of the traditional mode of innovation and entrepreneurship education in the second classroom, and constructed a new mode of innovation and entrepreneurship education in the second classroom from four aspects: mechanism construction, platform construction, school enterprise cooperation and teacher [12]. Cao et al deeply studied the excellent and innovative

talent training mode in the intelligent era from the aspects of talent training scheme and teaching practice methods [13]. In addition, some researchers studied the construction of curriculum system, teaching staff and evaluation mechanism [1; 14-15].

The above studies are basically carried out from a macro perspective. Although the research results have certain reference significance, they cannot be directly applied to the local universities focused by this study. In addition, the above previous studies have not conducted in-depth research on the information literacy, cognitive preferences and subculture of the college students, mostly from the generation after 00s'. Therefore, it is considered that this research has certain academic value and good application and promotion prospects.

## **4. Strategies for Constructing IET Training System**

### **4.1. Study Education Mode for Cultivation of IET**

First, clarify the subject status of innovation and entrepreneurship education. As a special subject, innovation and entrepreneurship education is incorporated into the talent training system and organically integrated with professional education. Second, innovation and entrepreneurship education should pay attention to the all-round development of students, take the cultivation of students' innovative spirit and entrepreneurial ability as the highest goal of talent quality training on the basis of professional education, and take serving social and economic development and the construction of an innovative country as the ideal pursuit of higher education. Third, in the education mode, we should improve students' innovation ability and entrepreneurial ability through multi-level and three-dimensional curriculum structure, teaching and practice process. Four, we should pay attention to and highlight students' personality training in general education, and respect students' interests and intention choice. Five, the space of education should be vigorously developed. The practice of theory and the exercise of socialized practical ability should be strengthened. At last, we should implement innovation and entrepreneurship education to cultivate high-quality IET.

### **4.2. Build Diversified and High-quality Team of Teachers**

Building a diversified and high-quality double qualified teacher team with high information literacy, professional theory and practical experience, teaching and scientific research ability required by the "ivory tower" and the ability to "go in for business" to solve practical production problems will significantly improve the quality and effect of training IET in local colleges and universities. In the intelligent age, the iterative speed of knowledge updating is greatly accelerated. Therefore, on the one hand, teachers should update their knowledge structure and accept new knowledge through various means such as training, academic training, academic exchanges, and enterprise practice, and e-learning, so as to lay a good foundation for teaching and educating people. On the other hand, we should constantly update our teaching concepts, learn and master new teaching methods, keep pace with the times, constantly improve our teaching skills and enhance the teaching effect. In terms of institutional arrangements, we will improve the awareness and ability of teachers' innovation and entrepreneurship education as an important part of pre-job training, and establish a temporary training system for relevant professional teachers and full-time teachers of innovation and entrepreneurship education in industrial enterprises. Universities should encourage the transformation of achievements and lead students to innovate and start businesses.

### **4.3. Reconstructing Innovation and Entrepreneurship Curriculum System in Intelligent Era**

First, we should form a diversified curriculum system, divide innovation and entrepreneurship courses into general education innovation and entrepreneurship courses, professional innovation and entrepreneurship courses and broadening innovation and entrepreneurship

courses, and incorporate them into the talent training program. Second, we should take the discipline competition as the starting point to carry out the in-depth integration of innovation and entrepreneurship education and professional education, e.g., teaching practice of professional courses in the competition. We should introduce successful entrepreneurship case sharing, expert entrepreneurship guidance and other courses to share the entrepreneurial process of successful entrepreneurs.

#### **4.4. Build Efficient Learning Platform for Innovation and Entrepreneurship Education**

The teaching content in the intelligent age should not only focus on the teaching of knowledge, but also pay more attention to the training of students' critical thinking, learning ability and professional skills. We should train students in these valuable abilities, change the previous teaching mode dominated by teachers, and adopt the discussion, experimental and heuristic teaching mode. We should take students as the center, let teachers change from "knowledge imparter" to "knowledge leader", and realize the new teaching mode of "learner centered". Timely adopt collaborative learning strategy, and widely integrate virtual simulation technology into learning experience.

#### **4.5. Actively Explore Various Teaching Means of "Internet plus" Mode**

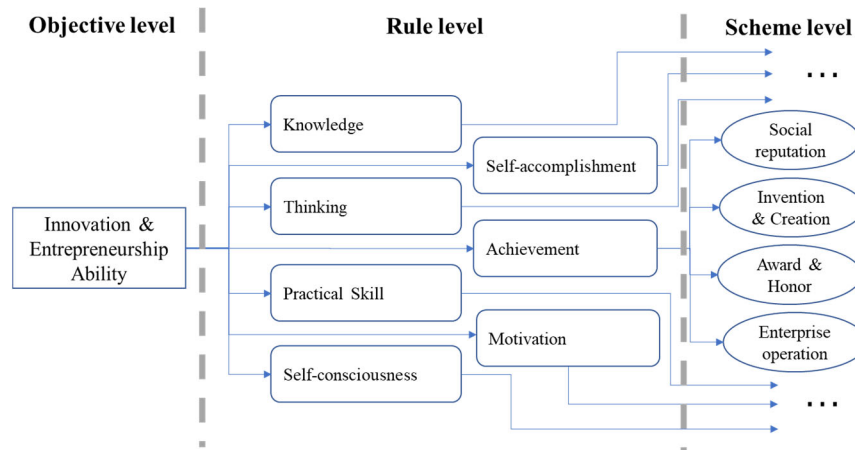
Teachers are encouraged to use Internet technology to realize the fragmented learning of online teaching content, making the teaching content more diverse and interesting. Teachers should combine the information literacy, cognitive preferences and subculture phenomena of the college students from the generation after 00s, select appropriate platform software for teaching, and exercise students' ability to acquire knowledge independently and programming by themselves. Teacher should make full use of MOOC and other teaching resources provided online to carry out practice and improve their practical ability, as well as using the competition platform to open course practice.

### **5. Empirical Study of Teaching Reform**

#### **5.1. Construction of Evaluation Index System**

According to the analytic hierarchy process [16], the author uses the scale method to determine the importance of the evaluation of different factor indicators. The scale value is comprehensively determined after repeated research by selecting expert opinions and survey data. This study obtains the judgment matrix by comparing the two indicators through the interview opinions of innovation and entrepreneurship education experts from five local colleges and universities.

According to the competency model theory [17], following the index construction principle under the background of the intelligent era, and based on the perspective of OBE [18-19], the author constructs the index framework for the evaluation of innovation and entrepreneurship ability. The index framework is consisted of three levels which is illustrated in Figure 1.



**Figure 1.** Index framework for the evaluation of innovation and entrepreneurship ability

**Table 1.** Weights of Comprehensive Evaluation Index System of Innovation and Entrepreneurship Ability

Objective level		Scheme level		Final objective weight
Indicators	Weight	Indicators	Weight	
Knowledge	0.12	Business knowledge	0.212	0.02544
		Innovation & entrepreneurship theory	0.254	0.03048
		Emerging technologies	0.191	0.02292
		Interdisciplinary knowledge	0.207	0.02484
		Legal cognition	0.136	0.01632
Thinking	0.13	Creative thinking	0.315	0.04095
		Opportunity insight	0.251	0.03263
		Thinking flexibility	0.259	0.03367
		Logical thinking	0.175	0.02275
Practical Skill	0.19	Observation recognition	0.118	0.02242
		Cooperation & communication	0.151	0.02869
		Leadership	0.132	0.02508
		Emergency handling capacity	0.123	0.02337
		Informatization ability	0.145	0.02755
		Process quality control	0.133	0.02527
Self-consciousness	0.13	Market Research Ability	0.117	0.02223
		Resource utilization capacity	0.081	0.01539
		Self-evaluation consciousness	0.197	0.02561
		Self-orientation	0.211	0.02743
		Self-confidence	0.344	0.04472
Self-accomplishment	0.09	Sense of worth	0.248	0.03224
		Physical & mental health	0.105	0.00945
		Sense of social responsibility	0.265	0.02385
		Creative spirit	0.322	0.02898
		Ability to resist setbacks	0.147	0.01323
Motivation	0.07	Adventurous & enterprising spirit	0.161	0.01449
		External needs	0.257	0.01799
		Endogenous power	0.301	0.02107
		Sustained interest	0.125	0.00875
		Stable investment	0.317	0.02219
Achievement	0.27	Invention and creation	0.255	0.06885
		Award & Honor	0.301	0.08127
		Enterprise operation	0.240	0.0648
		Social reputation	0.204	0.05508

Based on the index framework, we propose the more detailed index system with weights in Table I, which contains seven indicators in rule level and corresponding sub-indicators. These indicators not only directly reflect that the teaching evaluation subject of innovation and entrepreneurship education is students, but also cover its results and outputs.

## 5.2. Evaluation of Implementation Results

To verify the significance and effectiveness of the method proposed in this research, we set up a group of college students (60 students in total) from grade 2019 as the experimental group (termed as E. G.), and implemented teaching reform in two semesters. To compare the effect of teaching reform, we observe the other students (60 students in total) as the control group (termed as C. G.). We collect the statistical data of students' learning behavior and achievements on innovative and entrepreneurial talent. Then we quantify the learning effect through interview and questionnaire surveys. Next, data analysis is made. The analysis results are shown in Table 2.

**Table 2.** Comparison of Outcomes of Talent Training between Experimental Group and Control Group

E. I.	Max.		Min.		Avg.		S. D.	
	C. G.	E. G.	C. G.	E. G.	C. G.	E. G.	C. G.	E. G.
Knowledge (12 Pts)	10.947	11.812	5.821	7.550	8.400	12.397	3.075	3.004
Thinking (13 Pts)	11.790	12.650	6.557	8.465	12.979	11.744	3.571	2.154
Practical Skill (19 Pts)	16.940	18.888	8.924	12.415	16.698	18.641	4.637	4.084
Self-consciousness (13 Pts)	11.009	12.370	5.524	8.193	8.777	12.346	2.957	2.300
Self-accomplishment (9 Pts)	6.085	8.306	3.159	6.293	7.300	10.961	2.323	1.809
Motivation (7 Pts)	6.498	6.870	3.491	5.977	5.643	9.110	2.365	0.579
Achievement (27 Pts)	26.473	26.243	13.416	17.456	22.742	23.941	6.794	4.591
Total (100 Pts)	89.743	97.139	46.893	66.350	73.154	82.944	N/A	N/A

Note: "E. I." represents "Evaluating indicator", "Max. / Min." represents "Maximum / Minimum" and "Avg." represents "Average", "S. D." represents "Standard Deviation".

The results illustrated in the above table indicate a series of facts. On one hand, the average scores and total scores of the seven evaluating indicators of the E. G. are significantly better than those of the C. G. On the other hand, the standard deviations of E. G. are also lower than its counterpart, which indicates that the polarization phenomenon is also significantly improved. As a result, it further substantiates that the proposed IET training system has achieved the expected IET outcomes.

## 6. Conclusion

Guided by the demand for talents in the intelligent era, this paper deeply studies the innovative and entrepreneurial talent training system in the intelligent era from the aspects of talent training schemes and teaching practice methods. The research results of this paper meet the needs of students for knowledge, comprehensively analyze the current situation of IET training and teaching methods in local colleges and universities, and the subjective and objective factors affecting students' comprehensive quality and educational effect. Therefore, it will give full play to the advantages of the intelligent era and stimulate students' desire for knowledge to the greatest extent. In terms of teaching methods, the "student-centered" teaching model is fully adopted to improve students' learning initiative and teaching effect, which meets the needs of college teachers. The research results of this study enrich the theoretical treasure house of

cultivating IET in local colleges and universities and provide a new perspective for local colleges and universities to cultivate IET under the constraints of relative lack of resources.

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