Construction of Evaluation Indicator System for Innovation and Entrepreneurship Education in Sichuan Universities

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Abstract **– The upgrading of industrial structure and the comprehensive application of intelligent manufacturing technology have promoted the transformation of innovation and entrepreneurship education in Chinese colleges and universities and the reconstruction of the evaluation system. Based on the theory of entrepreneurial competence and contemporary educational evaluation theory, and in accordance with the requirements of the General Office of the State Council on the Implementation Opinions on Deepening the Reform of Innovation and Entrepreneurship Education in Colleges and Universities, and guided by the theory of CIPP evaluation model, we will construct an evaluation system of innovation and entrepreneurship education in Sichuan colleges and universities in the five aspects of evaluation content, It is of great practical significance for deepening the reform of innovation and entrepreneurship education and improving the quality of entrepreneurial talents.**

Keywords **– Sichuan Province, colleges and universities, quality of innovation and entrepreneurship education, evaluation indicator system, construction.**

I. INTRODUCTION

This paper analyses the entrepreneurial competency model and educational evaluation theory, outlining the construction of an effectiveness evaluation system for innovation and entrepreneurship education in seven aspects: evaluation content, evaluation subject, evaluation object, evaluation method, evaluation standard, and evaluation result. The relevant theoretical foundations are employed to provide a certain reference and guidance for the evaluation of the effectiveness of innovation and entrepreneurship education in Sichuan colleges and universities.

II. RESEARCH BACKGROUND

The quality of innovation and entrepreneurship education is an intrinsic demand of education development under the new economic pattern.

In the context of economic globalization, global economic development has been affected by major events such as industrial restructuring and epidemic outbreaks (Arthur-Holmes et al., 2023). The advent of an economic form characterised by innovation and change, coupled with the continuous value-added of the intelligent manufacturing industry, has signalled a new direction for economic development under the new economic form.

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This has led to the realisation that innovation (Allais, 2023) and reform will be a very important trend for the development and reform of education for the foreseeable future (Arthur-Holmes et al., 2023). In order to cultivate more creative talents with creativity and innovative skills for the new era, it is imperative that education realises a self-breakthrough under the new economic form (Xiaobao et al., 2023). This study of evaluation is timely.

China's Need to Cultivate High-Quality Innovative Talents.

The Chinese government has repeatedly emphasized the importance of quality in innovation and entrepreneurship education programs at both the macro level of policy design and the micro level of implementation(Kaushik et al., 2023a). Nevertheless, due to the delayed commencement of innovation and entrepreneurship education in China, the sector is still in the nascent stages of development, with an emphasis on "introduction, absorption, and gradual localization."(Asuncion et al., 2023) Furthermore, the evaluation of innovation and entrepreneurship education is still in its infancy, with a focus on "top-down" approaches. This has resulted in a lack of consensus on the quality of innovation and entrepreneurship education, as well as the subject of pluralism (Petrolo et al., 2023). Additionally, there is a dearth of evaluation systems with diversified evaluation subjects and comprehensive indicators. Sichuan Province boasts 134 ordinary higher education institutions, with a student population of over 2.9 million(Liu Dong, 2023). This represents a significant scale of school running. The strengthening of research on the quality evaluation of innovation and entrepreneurship courses in the province will assist in elucidating the present state of innovation and entrepreneurship course construction in colleges and universities. It will also facilitate the identification of the principal issues in the process of course construction and implementation(Chen et al., 2023). Furthermore, it will enable the exploration of the improvement of the quality evaluation system of innovation and entrepreneurship courses. Finally, it will provide theoretical references and practical guidance for the cultivation of innovation and entrepreneurship talents in the province.

III. PROBLEM STATEMENT

A scientific and systematic evaluation system of innovation and entrepreneurship education has not yet been constructed.

A review of the literature on the evaluation of innovation and entrepreneurship education in the United

States and abroad reveals that foreign research tends to focus on the evaluation of entrepreneurship education in colleges and universities (Fossatti et al., 2023). The evaluation system is primarily concerned with the impact of entrepreneurship education on the economy and society, the operational process of entrepreneurship education programs, and the effectiveness of innovation and entrepreneurship education in higher education institutions. Domestic research results have primarily focused on the evaluation of innovation and entrepreneurship education in colleges and higher vocational colleges and universities, with the construction of evaluation index systems with varying foci(Jebsen et al., 2023). In contrast, systematic research on the construction of the system of evaluation purpose, evaluation content, evaluation subject, evaluation object, evaluation method, evaluation standard, and evaluation result has been relatively limited. Among the existing evaluation results on innovation and entrepreneurship education, there is no evaluation specifically for innovation and entrepreneurship education(Xin et al., 2023). This results in a lack of improvement to the quality evaluation mechanism jointly participated by the government, industry, enterprises, and vocational colleges and universities. Furthermore, there is a lack of scientific and perfect evaluation system support in the operation of the evaluation practice, which is not in line with the requirements of the state for innovation and entrepreneurship education.

There is currently no clear evaluation purpose or content for innovation and entrepreneurship education in colleges and universities.

From the perspective of evaluation purpose, the current evaluation of innovation and entrepreneurship education follows the traditional top-down evaluation method, which still focuses on the static and quantitative evaluation of education objects (Thepna et al., 2023). This method often evaluates the stage results and education results, rather than the individual development process of education objects. Furthermore, the evaluation lacks a scientific and effective method for assessing the individual development process of education subjects (Di Paola et al., 2023). Additionally, the evaluation does not consider the activities of education subjects in the process of education, which makes it impossible to comprehensively evaluate the development changes of education subjects and objects in the process of education (Zhu et al., 2023). Moreover, the evaluation of education has not reflected the purpose of promoting the improvement of education and the improvement of education quality. There is a dearth of scientific and effective evaluation of the individual development process of educational objects, and a paucity of coverage of the activities of educational subjects in the educational process, which renders it impossible to conduct a comprehensive evaluation of the development and changes of educational subjects and educational objects in the educational process (Makaya et al., 2023).

In terms of evaluation content, it mainly involves the educational environment, educational inputs, educational process, educational results, and other aspects. However, due to the different focuses of the evaluation system and the purpose of evaluation, there is still a lack of research on the comprehensiveness, standardization, and systematization of the evaluation content (Yongliang, 2023).

The standards and methods for evaluating innovation and entrepreneurship education in colleges and universities have not yet been established.

From the perspective of evaluation standards, the evaluation standards of vocational education are relatively broad, not targeted, and cannot effectively highlight the innovative, creative, and practical characteristics of innovation and entrepreneurship education (Tseng et al., 2023). This is especially evident in the implementation of the standards, which fails to reflect the unique requirements of university education. Additionally, there is a lack of a clear definition of the three aspects of the effectiveness standards, responsibility standards, and quality standards of innovation and entrepreneurship education (van Rijnsoever et al., 2023). From the perspective of evaluation methodology, the current evaluation paradigm exhibits a state of misalignment between practice and demand. The evaluation mode is characterized by a relative focus on summative evaluation, which has led to a dearth of process evaluation. Similarly, the mode is marked by a relative focus on quantitative evaluation, which has resulted in a slight insufficiency of qualitative evaluation. Finally, the mode is defined by a relative focus on overall evaluation, which has led to a neglect of individual evaluation (Kaushik et al., 2023b).

The scope of the evaluation subject has not yet been determined and expanded.

Currently, the evaluation of entrepreneurship education is primarily conducted by the government, education department, and schools. The education department oversees management, evaluation, and operation, yet encounters challenges in maintaining objectivity, scientific rigor, and credibility in its self-evaluations (Malik et al., 2023). Industry enterprises are well-acquainted with the evolution of the industry and possess a comprehensive understanding of the employment demands and talent specifications of enterprises(Amalu et al., 2023). They are thus able to anticipate the direction of educational development and propose well-reasoned suggestions. It is evident that industry enterprises are the most qualified to evaluate innovation and entrepreneurship education. However, in practice, industry enterprises frequently find themselves in a position of marginalization and exclusion in the realm of education evaluation.

Two deficiencies are evident in the evaluation of entrepreneurship courses at Sichuan universities (Amalu et al., 2023). Firstly, the course evaluation system relies on traditional final examination results as the sole indicator of students' innovation and entrepreneurship course performance. This approach lacks a comprehensive and progressive assessment framework to assess students' knowledge and abilities. Consequently, it is challenging to

ascertain whether students have truly attained the competencies expected by the course objectives (Suhardi et al., 2022). Secondly, the evaluation of entrepreneurship courses is primarily based on evaluation indexes issued by the government as the evaluation standard. This approach fails to consider the specific circumstances of the course in question and thus prevents it from demonstrating its unique characteristics (Huang, 2022).

IV. LITERATURE REVIEW

A review of the literature reveals that scholars have primarily focused their research on the evaluation principles, evaluation contents, and evaluation methods of innovation and entrepreneurship education (Shofwan et al., 2023).

With regard to the evaluation principles of innovation and entrepreneurship education courses, extant studies have primarily investigated the principles that should be adhered to in the design of course evaluations, the content of evaluations, and the methods employed in evaluations. In his 2016 study, Li Jingwang (A. Wang et al., 2022) posits that the evaluation of entrepreneurship education courses should adhere to three fundamental principles. Firstly, the principle of fitness for purpose stipulates that the evaluation should be conducted in alignment with the goals, nature and tasks of entrepreneurship education, and that the holistic and formative characteristics of evaluation should be fully embodied (Zeng et al., 2023). Secondly, the principle of conformity to the law stipulates that the design and operation of evaluation should be in line with the basic nature of education and teaching as well as the inherent rules and regulations, and in line with the laws of education evaluation (Lv et al., 2022). Thirdly, the operability principle refers to the establishment of scientific, reasonable, and effective evaluation methods. The principle in question pertains to the establishment of a scientific, reasonable, concise, and effective evaluation index system. This system specifies the evaluation content into observable and measurable evaluation indexes, thereby ensuring the operability of evaluation (Liu et al., 2023). Yu Lu (2022) posits that the evaluation of innovation and entrepreneurship courses should adhere to a multi-faceted approach, encompassing both quantitative and qualitative evaluation, long-term and short-term evaluation, summative and generative/diagnostic evaluation, internal and external evaluation (Yongtang, 2020). Additionally, it is essential to clarify several key issues, including the rationale behind evaluation, the specific elements to be evaluated, the optimal timing for evaluation, and the most effective evaluation methodology (Venesaar et al., 2022).

With regard to the research on the evaluation content of innovation and entrepreneurship education courses, the existing research results indicate that the evaluation of innovation and entrepreneurship education primarily encompasses the assessment of the dimensions of the course itself, the instructor's teaching, and the student's learning outcomes(C. Wang et al., 2022). With respect to the various evaluation contents, the researchers propose distinct evaluation methodologies. For instance, Wortman(Campo-Sierra et al., 2024) posits that the evaluation of the implementation effect of entrepreneurship education courses can be conducted by assessing the degree of integration and the number of courses offered in the entrepreneurship education of colleges and universities(Estrin et al., 2024). Wortman(Somià et al., 2024) posits that the efficacy of entrepreneurship education program implementation can be gauged by examining the extent of integration of entrepreneurship education courses within universities and the number of entrepreneurship education courses offered. McMullan et al. (Overwien et al., 2024) propose a set of evaluation indicators for entrepreneurship education programs, which include the number of businesses initiated, output and increased revenue, and jobs created.

In their respective works, Taylor Huber (Song et al., 2024)and Yorke (Song et al., 2024)proposed that the evaluation of teachers' teaching should be conducted in a manner that encompasses a series of value judgments made on the process and results of entrepreneurship education teaching activities. This evaluation should be carried out throughout the entirety of the teaching activities, rather than solely after their completion. Additionally, the degree to which students meet the requirements of the teaching objectives and the extent of their achievement can serve as a measure of the effectiveness of teachers' teaching(Zheng, 2024). The degree of students' achievement of the teaching objectives and their achievement of the objectives is also an important indicator of the effectiveness of teachers' teaching. The value judgment of students' learning results should be carried out according to certain standards. The means or methods of evaluation can be carried out in a variety of ways, including practical internship surveys, questionnaires, self-assessment, other evaluation, and teachers' assessment. Incentives should be given to teachers who have remarkable teaching results to stimulate teachers' enthusiasm for teaching. The conference will commence shortly(Li et al., 2024).

Xue Hui (Guo et al., 2024)posits that the evaluation mechanism of innovation and entrepreneurship education in colleges and universities should encompass both internal and external evaluations. The internal evaluation encompasses midterm and final examinations, as well as spot checks conducted by colleges and universities. The external evaluation entails distributing and collecting satisfaction questionnaires from students, as well as convening evaluation meetings to promote the teaching situation of the courses(Yuan et al., 2024). Concurrently, colleges and universities should establish a management and evaluation system for innovative entrepreneurship courses and provide regular guidance and management of the course teaching process. Yu Lu (Avelar et al., 2024)posits that the evaluation of innovation and entrepreneurship education courses encompasses the assessment of the course itself, as well as the impact of teaching and learning.

V. THEORETICAL BASIS

Theories of Educational Evaluation

Contemporary educational evaluation theory has roughly gone through four eras: the era of measurement, the era of description, the era of value judgment, and the era of meaning construction (Yuan et al., 2024). The characteristics of the measurement era are quantification, objectification, and standardization (Oyinlola et al., 2024). In contrast, the characteristics of the description era are focused on both the measurement results and the interpretation of the measurement results. The characteristics of the value judgment era are the making of judgments on the value of educational activities. Finally, the characteristics of the meaning construction era are co-construction, comprehensive participation, and value diversification (Haddoud et al., 2024). An analysis of the evolution of educational evaluation theories reveals that those of the first three eras tend to adhere to the positivist paradigm, whereas those of the fourth generation tend to align with the constructivist paradigm. This is evident in the evaluation assumptions, values, methodology, and evaluation ethics (Mambali et al., 2024). In light of the evolving landscape of contemporary educational indicators, the evaluation of innovation and entrepreneurship education in Sichuan universities necessitates a comprehensive approach that integrates contemporary educational evaluation theories. This approach should encompass a synthesis of the objectivist and constructivist paradigms, with an emphasis on the integration of empirical methods (e.g., standardized tests) and qualitative analytical methods (e.g., observation, interviews, and discussions). This integration is essential for the formulation of evaluation standards, the selection of evaluation methods, and the establishment of an effective evaluation organization.

Entrepreneurial Competency Model

In the 1950s, Harvard University professor David McClellan proposed the concept of competency evaluation(Otache et al., 2024). As the research progressed, some scholars introduced the competency theory into entrepreneurship research and proposed the concept of "entrepreneurial competency." They then proceeded to study the entrepreneurial traits and establish various entrepreneurial competency models based on the method of competency assessment. Dr. Yinghui Wang (Ranasinghe, 2024) takes the competency model as the theoretical foundation and, based on the existing research, extracts the key elements of college students' entrepreneurial competency. These elements are based on the human capital theory, Timmons' entrepreneurial process theory, and Bruce Tuckman's developmental stage theory. After empirical testing, Wang forms a complete set of entrepreneurial competency index system. The index system comprises three first-level indexes (entrepreneurial awareness, entrepreneurial spirit, and entrepreneurial core competence) and 11 second-level indexes (entrepreneurial motivation, entrepreneurial confidence, innovation spirit, professionalism, cooperation spirit, social responsibility, opportunity grasping ability, strategic ability, team leadership ability, business operation ability, and financing ability)(Cheng et al., 2024).

This model incorporates the concept of an "innovative spirit" into the index system, which elucidates the requisite competencies for entrepreneurship literacy and innovative spirit through the use of specific indicators(Gupta et al., 2024). The application of this theory to this study will provide an important basis and reference for the construction of a quality evaluation system for innovation and entrepreneurship education in Sichuan universities.

VI. CONSTRUCTION OF AN EVALUATION SYSTEM FOR INNOVATION AND ENTERPRENEURSHIP EDUCATION IN SICHUAN UNIVERSITY

This section outlines the construction of an evaluation system for innovation and entrepreneurship education in Sichuan universities. It draws upon contemporary educational evaluation theory and the introduction of an entrepreneurial competence model. The evaluation system is constructed from five aspects: evaluation content, evaluation subject, evaluation object, evaluation standard and evaluation result (Al-Qadasi et al., 2024).

Evaluation Content

The CIPP evaluation model serves as a theoretical framework for the construction of an evaluation index system, which is organized into four categories: curriculum design, input evaluation, process evaluation, and result evaluation (Table 1). The first objective is to evaluate the framework, board, content, and other indicators related to innovation and entrepreneurship courses in Sichuan universities(Zhou et al., 2024). The second objective is to assess whether the guaranteed inputs, such as the construction of faculty, financial inputs, and the construction of practice platforms, meet the degree of attainment of the objectives of innovation and entrepreneurship education in Sichuan. The third objective is to evaluate the implementation methods, means, teaching methods, and students' participation in the curriculum system. The fourth objective is to evaluate the innovation and evaluation of the quality results after the implementation of entrepreneurship education is completed(Zhou et al., 2024).

TABLE I: EVALUATION INDEX SYSTEM OF INNOVATION AND ENTERPRENEURSHIP EDUCATION IN SICHUAN PUNIVERSITIES

Content		
Level 1 indicators	Level 2 indicators	Level 3 indicators
Innovation and Entrepreneurship Education Program	Program Objectives	Total number of courses, total number of course hours, ratio of course hours to total training hours, integration of innovation and entrepreneurship education with professional education
	Course content	Course content boards, degree of correlation between courses and specialized courses, development of practical activities in courses, course levels
Investment in innovation and entrepreneurship education	Faculty development	Student-teacher ratio in innovation and entrepreneurship education, level of teachers in innovation and entrepreneurship education, percentage of teachers with innovation and entrepreneurship experience, composition of entrepreneurship mentor team, ratio of entrepreneurship mentors to students enrolled in vocational colleges and universities, ability of entrepreneurship mentors in guiding students to start their own businesses
	Status of funding inputs	Investment of special funds for innovation and entrepreneurship on campus, special support funds from governmental functional departments, and crowdfunding by students
	Practice Platform Construction	Number and scale of practice bases, improvement of functions of practice bases, opening of practice bases to teachers and students, service capacity of practice bases
Innovation and entrepreneurship education process	Methods and forms of course education	Methods and modes of course teaching, forms of course implementation, forms of course practice
	Service Guidance Support	Construction of innovation and entrepreneurship working institutions, activity of innovation and entrepreneurship clubs, incubation of innovation and entrepreneurship projects, organization and guidance of innovation and entrepreneurship competitions, and development of the second classroom of innovation and entrepreneurship education
	Student participation in the process	Students' classroom attendance, students' evaluation of teaching and learning process, students' evaluation of teachers, teachers' evaluation of students, students' participation in innovative and entrepreneurial practices
Innovative entrepreneurship education outcomes	social impact	Number of entrepreneurial programs fostered by practice bases, number of outstanding entrepreneurial alumni, economic and social benefits
	Quality of education	Achievement of Innovation and Entrepreneurship Education Goals, Graduate Employment Quality, Graduate Employability, Graduate Entrepreneurship-led Employment

Evaluation Subjects

In order to evaluate innovation and entrepreneurship education in colleges and universities, it is necessary to consider the perspectives of the government, industry, enterprises, students, colleges and universities, and tripartite evaluation organizations(Wen et al., 2024). This approach allows for an all-round evaluation of the supply side of talents, the environment of education implementation, education input, and the education process(Wei et al., 2024). It is imperative that industries and enterprises, as the primary source of talent demand, evaluate the entrepreneurial abilities, entrepreneurial awareness, and innovative spirit of graduates, with a particular focus on the quality of talent training. It is incumbent upon students, as the object of training, to evaluate the faculty, curriculum, and educational effectiveness of innovation and entrepreneurship education.

Evaluation Objects

Innovation and entrepreneurship education primarily produces three types of "products" for society: talents, technology, and social services (Pan et al., 2024). Consequently, the evaluation of innovation and entrepreneurship education in colleges and universities is to assess the role of innovation and entrepreneurship education in fostering the growth of students and the employment and entrepreneurship of graduates (Xiong et al., 2024). This primarily entails evaluating students' sense of social responsibility, spirit of innovation, entrepreneurial awareness, and entrepreneurial ability. The second objective is to assess the output of innovation and entrepreneurship education in the areas of technology inheritance and social service. The second objective is to assess the quality of the output of innovation and entrepreneurship education in technology inheritance and social service(Xiong et al., 2024). This is primarily a process of evaluating schools, teachers, and students in terms of their contributions to technological innovation and inheritance, as well as social service. The object of evaluation is therefore the aforementioned schools, teachers, and students.

Evaluation Standards

The education evaluation standard refers to the specific provisions of education quality requirements, which are mainly composed of three parts: performance standard, duty standard, and quality standard. In formulating the evaluation standard for vocational education and innovation and entrepreneurship education(Tam et al., 2024), it is essential to align the evaluation object with the needs of the market in terms of performance standard, duty standard, and quality standard(Hoffmann et al., 2024). It is necessary to adopt a market-oriented perspective and to formulate standards through a process of dialogue and negotiation. The degree to which the standards meet the needs of the market should be taken as the basis for evaluation.

Evaluation Results

The evaluation results of innovation and entrepreneurship education in colleges and universities should be based on an objective, fair, and scientific assessment of the current situation of education, an accurate description of educational achievements and problems, and the formulation of rationalization suggestions to promote the diagnosis and optimization of innovation and entrepreneurship education in colleges and universities and to achieve the role of “evaluation for improvement.”(Keim et al., 2024) Consequently, the utilization, motivation, and rectification of the results of the summative evaluation of innovation and entrepreneurship in colleges and universities should be incorporated into the evaluation system as a means of facilitating the effective alignment of educational outcomes with the demands of innovation and entrepreneurship education in the context of social development.

REFERENCES

Allais, S. (2023). Why skills anticipation in African VET systems needs to be decolonized: The wide-spread use and limited value of occupational standards and competency-based qualifications. *International Journal of Educational Development*, *102*. https://doi.org/10.1016/j.ijedudev.2023.102873

Al-Qadasi, N., Zhang, G., Al-Jubari, I., Al-Awlaqi, M. A., & Aamer, A. M. (2024). Entrepreneurship education and entrepreneurial behaviour: Do self-efficacy and attitude matter? *International Journal of*

Management Education, *22*(1). https://doi.org/10.1016/j.ijme.2024.100945

Amalu, E. H., Short, M., Chong, P. L., Hughes, D. J., Adebayo, D. S., Tchuenbou-Magaia, F., Lähde, P., Kukka, M., Polyzou, O., Oikonomou, T. I., Karytsas, C., Gebremedhin, A., Ossian, C., & Ekere, N. N. (2023). Critical skills needs and challenges for STEM/STEAM graduates increased employability and entrepreneurship in the solar energy sector. In *Renewable and Sustainable Energy Reviews* (Vol. 187). Elsevier Ltd. https://doi.org/10.1016/j.rser.2023.113776

Arthur-Holmes, F., Yeboah, T., Cobbinah, I. J., & Abrefa Busia, K. (2023). Youth in artisanal and small-scale mining (ASM) and higher education nexus: Diffusion of innovations and knowledge transfer. *Futures*, *152*. https://doi.org/10.1016/j.futures.2023.103201

Asuncion, A. C., de Vera Asuncion, A., Macalipis, J. G., Borromeo, C. M. T., Rivera, J. C., & Limon, M. R. (2023). Weaving gaps in garments education technology: Crafting a skill-based E-toolkit based on Taba's curriculum development model. *Social Sciences and Humanities Open*, *8*(1). https://doi.org/10.1016/j.ssaho.2023.100656

Avelar, S., Borges-Tiago, T., Almeida, A., & Tiago, F. (2024). Confluence of sustainable entrepreneurship, innovation, and digitalization in SMEs. *Journal of Business Research*, *170*. https://doi.org/10.1016/j.jbusres.2023.114346

Campo-Sierra, S., Escorcia-Caballero, J. P., & Chams-Anturi, O. (2024). Assessing Operational Performance Outcomes in Rural Entrepreneurship. *Procedia Computer Science*, *231*, 458–463. https://doi.org/10.1016/j.procs.2023.12.234

Chen, S., Shen, W., Qiu, Z., Liu, R., & Mardani, A. (2023). Who are the green entrepreneurs in China? The relationship between entrepreneurs' characteristics, green entrepreneurship orientation, and corporate financial performance. *Journal of Business Research*, *165*. https://doi.org/10.1016/j.jbusres.2023.113960

Cheng, C., Gao, Q., Ju, K., & Ma, Y. (2024). How digital skills affect farmers' agricultural entrepreneurship? An explanation from factor availability. *Journal of Innovation and Knowledge*, *9*(2). https://doi.org/10.1016/j.jik.2024.100477

Di Paola, N., Meglio, O., & Vona, R. (2023). Entrepreneurship education in entrepreneurship laboratories. *International Journal of Management Education*, *21*(2). https://doi.org/10.1016/j.ijme.2023.100793

Estrin, S., Guerrero, M., & Mickiewicz, T. (2024). A framework for investigating new firm entry: The (limited) overlap between informal-formal and necessity-opportunity entrepreneurship. *Journal of Business Venturing*, *39*(4), 106404. https://doi.org/10.1016/j.jbusvent.2024.106404

Fossatti, P., Chiappetta Jabbour, C. J., Ratten, V., Pereira, G. M., Borchardt, M., Milan, G. S., & Eberle, L. (2023). What do (should) we know to leverage students' employability and entrepreneurship? A systematic guide to researchers and managers. *International Journal of Management Education*, *21*(2). https://doi.org/10.1016/j.ijme.2023.100788

Guo, Q., Qian, Y., Tan, W., & Xie, Z. (2024). Does financial literacy drive entrepreneurship in rural China? *Finance Research Letters*, *61*. https://doi.org/10.1016/j.frl.2024.105046

Gupta, B. B., Gaurav, A., Arya, V., & Chui, K. T. (2024). Fintech advancements in the digital economy: Leveraging social media and personal computing for sustainable entrepreneurship. *Journal of Innovation and Knowledge*, *9*(1). https://doi.org/10.1016/j.jik.2024.100471

Haddoud, M. Y., Nowiński, W., Laouiti, R., & Onjewu, A. K. E. (2024). Entrepreneurial implementation intention: The role of psychological capital and entrepreneurship education. *International Journal of Management Education*, *22*(2). https://doi.org/10.1016/j.ijme.2024.100982

Hoffmann, V. E., Fernando, L., Viana, C., Dalcero, K., & Schlichting Costa De Almeida, M. (2024). *The opening and closing of firms before a shock: Lessons on entrepreneurship and regional resilience in Santa Catarina, Brazil*. https://doi.org/10.1016/j.rspp.2024.100057

Huang, C. (2022). Research on Curriculum System Construction of Innovation and Entrepreneurship Education in Higher Vocational Colleges. *Learning & Education*, *10*(7), 149. https://doi.org/10.18282/l-e.v10i7.2985

Jebsen, S., Senderovitz, M., & Winkler, I. (2023). Shades of green: A latent profile analysis of sustainable entrepreneurial attitudes among business students. *International Journal of Management Education*, *21*(3). https://doi.org/10.1016/j.ijme.2023.100860

Kaushik, V., Tewari, S., Sahasranamam, S., & Hota, P. K. (2023a). Towards a precise understanding of social entrepreneurship: An integrated bibliometric–machine learning based review and research agenda. *Technological Forecasting and Social Change*, *191*. https://doi.org/10.1016/j.techfore.2023.122516

Kaushik, V., Tewari, S., Sahasranamam, S., & Hota, P. K. (2023b). Towards a precise understanding of social entrepreneurship: An integrated bibliometric–machine learning based review and research agenda. *Technological Forecasting and Social Change*, *191*. https://doi.org/10.1016/j.techfore.2023.122516

Keim, J., Müller, S., & Dey, P. (2024). Whatever the problem, entrepreneurship is the solution! Confronting the panacea myth of entrepreneurship with structural injustice. *Journal of Business Venturing Insights*, *21*. https://doi.org/10.1016/j.jbvi.2023.e00440

Li, J., Wang, H., & Soh, W. N. (2024). Digital transformation, financial literacy and rural household entrepreneurship. *Finance Research Letters*, *62*. https://doi.org/10.1016/j.frl.2024.105171

Liu Dong. (2023, December 11). *Sichuan Provincial Department of Education 2023 Annual Report on Government Information Disclosure Work*.

Http://Edu.Sc.Gov.Cn/Scedu/C100529/2023/1/30/7b8d8d0a11da4396b7a51673abfec747.Shtml.

Liu, F., Qu, S., Fan, Y., Chen, F., & He, B. (2023). Scientific creativity and innovation ability and its determinants among medical postgraduate students in Fujian province of China: a cross sectional study. *BMC Medical Education*, *23*(1). https://doi.org/10.1186/s12909-023-04408-9

Lv, M., Zhang, H., Georgescu, P., Li, T., & Zhang, B. (2022). Improving Education for Innovation and Entrepreneurship in Chinese Technical Universities: A Quest for Building a Sustainable Framework. *Sustainability (Switzerland)*, *14*(2). https://doi.org/10.3390/su14020595

Makaya, C., Blanco, C., & Barrédy, C. (2023). Towards an ecological approach for interaction management in entrepreneurship courses. *Journal of Business Research*, *160*. https://doi.org/10.1016/j.jbusres.2023.113749

Malik, A., Onyema, E. M., Dalal, S., Lilhore, U. K., Anand, D., Sharma, A., & Simaiya, S. (2023). Forecasting students' adaptability in online entrepreneurship education using modified ensemble machine learning model. *Array*, *19*. https://doi.org/10.1016/j.array.2023.100303

Mambali, E. R., Kapipi, M. S., & Changalima, I. A. (2024). Entrepreneurship education and business and science students' green entrepreneurial intentions: The role of green entrepreneurial self-efficacy and environmental awareness. *International Journal of Management Education*, *22*(2). https://doi.org/10.1016/j.ijme.2024.100987

Otache, I., Edopkolor, J. E., Sani, I. A., & Umar, K. (2024). Entrepreneurship education and entrepreneurial intentions: Do entrepreneurial self-efficacy, alertness and opportunity recognition matter? *International Journal of Management Education*, *22*(1). https://doi.org/10.1016/j.ijme.2023.100917

Overwien, A., Jahnke, L., & Leker, J. (2024). Can entrepreneurship education activities promote students' entrepreneurial intention? *International Journal of Management Education*, *22*(1). https://doi.org/10.1016/j.ijme.2023.100928

Oyinlola, M., Kolade, O., Okoya, S. A., Ajala, O., Adefila, A., Adediji, A., Babaremu, K., Tijani, B., Adejuwon, J., Wambui, F., & Akinlabi, E. T. (2024). Entrepreneurship and Innovation in Nigerian Universities: Trends, Challenges and Opportunities. *Heliyon*, e29940. https://doi.org/10.1016/j.heliyon.2024.e29940

Pan, Y., Zhang, S., & Zhang, M. (2024). The impact of entrepreneurship of farmers on agriculture and rural economic growth: Innovation-driven perspective. *Innovation and Green Development*, *3*(1). https://doi.org/10.1016/j.igd.2023.100093

Petrolo, D., Fakhar Manesh, M., & Palumbo, R. (2023). Unpacking business, management, and entrepreneurship education online: Insights from a hybrid literature review. *International Journal of Management Education*, *21*(2). https://doi.org/10.1016/j.ijme.2023.100812

Ranasinghe, A. (2024). Gender specific distortions, entrepreneurship and misallocation. *Journal of Economic Dynamics and Control*, *162*. https://doi.org/10.1016/j.jedc.2024.104858

Shofwan, I., Sunardi, S., Gunarhadi, G., & Rahman, A. (2023). Entrepreneurship Education: Encouraging Entrepreneurial Intentions for Equality Education Students in Semarang. *International Journal of Learning, Teaching and Educational Research*, *22*(6), 175–194. https://doi.org/10.26803/ijlter.22.6.10

Somià, T., Lechner, C., & Pittaway, L. (2024). Assessment and development of coachability in entrepreneurship education. *International Journal of Management Education*, *22*(1). https://doi.org/10.1016/j.ijme.2023.100921

Song, Y., Yang, L., & Li, L. (2024). A study on the impact mechanism of internet embedding on rural E-commerce entrepreneurship. *Research in International Business and Finance*, *68*. https://doi.org/10.1016/j.ribaf.2023.102196

Suhardi, R. M., Septiawan, A., & Haq, M. B. (2022). ENTREPRENEURIAL MOTIVATION AMONG ECONOMICS AND MANAGEMENT STUDENTS: THE ROLE OF ENTREPRENEURSHIP EDUCATION. *Jurnal Tatsqif*, *20*(2), 162–179. https://doi.org/10.20414/jtq.v20i2.6186

Tam, H. lin, Chan, A. Y. fung, Fung, T. T. on, & Isangha, S. O. (2024). The mediating effect of psychological strengths and resilience on enhancing youth employability through social entrepreneurship education and training. *Children and Youth Services Review*, *156*. https://doi.org/10.1016/j.childyouth.2023.107325

Thepna, A., Cochrane, B. B., & Salmon, M. E. (2023). Self-efficacy in nurse entrepreneurs: A concept analysis. *Nursing Outlook*, *71*(6). https://doi.org/10.1016/j.outlook.2023.102053

Tseng, T. H., Wu, T. Y., Lian, Y. H., & Zhuang, B. K. (2023). Developing a value-based online learning model to predict learners' reactions to internet entrepreneurship education: The moderating role of platform type. *International Journal of Management Education*, *21*(3). https://doi.org/10.1016/j.ijme.2023.100867

Van Rijnsoever, F. J., Sitzler, S., & Baggen, Y. (2023). The change agent teaching model: Educating entrepreneurial leaders to help solve grand societal challenges. *International Journal of Management Education*, *21*(3). https://doi.org/10.1016/j.ijme.2023.100893

Venesaar, U., Malleus, E., Arro, G., & Toding, M. (2022). Entrepreneurship competence model for supporting learners development at all educational levels. *Administrative Sciences*, *12*(1). https://doi.org/10.3390/admsci12010002

Wang, A., Zhan, Y., Yang, Y., & Chen, M. (2022). Exploring the Construction of Curriculum Standards for Innovation and Entrepreneurship Education in Higher Education Institutions Based on Curriculum Ideology and Politics. *Journal of Contemporary*

Educational Research, *6*(5). http://ojs.bbwpublisher.com/index.php/JCER

Wang, C., Liu, Q., Li, H., & Liu, Y. (2022). The Path of College Students' Entrepreneurship Education Under Causal Attribution Theory From the Perspective of Entrepreneurial Psychology. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.810615

Wei, H., Ding, A., & Gao, Z. (2024). The application of project management methodology in the training of college students' innovation and entrepreneurship ability under sustainable education. *Systems and Soft Computing*, *6*. https://doi.org/10.1016/j.sasc.2024.200073

Wen, X., Cheng, Z., & Tani, M. (2024). Rural-urban migration, financial literacy, and entrepreneurship. *Journal of Business Research*, *175*. https://doi.org/10.1016/j.jbusres.2023.114302

Xiaobao, P., Hongyu, C., & Horsey, E. M. (2023). The predictive effect of relative intuition on social entrepreneurship orientation: How do exploratory and exploitative learning and personal identity interact? *Acta Psychologica*, *237*. https://doi.org/10.1016/j.actpsy.2023.103951

Xin, W., Zhengying, Y., Sheng, W., & Lili, W. (2023). Training model of practical innovative talents in polytechnic colleges based on fuzzy set and its extended modeling. *Learning and Motivation*, *84*. https://doi.org/10.1016/j.lmot.2023.101941

Xiong, J., Huang, L., Yang, Z., & Wang, X. (2024). The impact of local government debt on entrepreneurship: Evidence from a quasi-natural experiment of local debt governance reform. *International Review of Economics and Finance*, *93*, 501–519. https://doi.org/10.1016/j.iref.2024.03.014

Yongliang, W. (2023). Organic integration of ideological and political education and entrepreneurship education based on artificial neural network. *Learning and Motivation*, *84*. https://doi.org/10.1016/j.lmot.2023.101933

Yongtang, J. (2020). *A Dissertation Submitted in Fulfillment of the Requirementsfor the Degree of Doctor of Philosophy in Higher Education On the Dilemma of and Solutions to Entrepreneurship Education in Local Universities from the Perspective of Organizational Transformation-based on the Investigation of Twenty-two Undergraduate Universities in Guangxi Candidate: Huang Hounan Major: Education Leadership and Management Supervisor*.

Yuan, F., Lu, Y., & Xu, P. (2024). Can hypergamy affect married women's entrepreneurship in China? *Women's Studies International Forum*, *103*. https://doi.org/10.1016/j.wsif.2024.102889

Zeng, L., Ye, J. H., Wang, N., Lee, Y. S., & Yuan, J. (2023). The Learning Needs of Art and Design Students in Chinese Vocational Colleges for Entrepreneurship Education: From the Perspectives of Theory of Entrepreneurial Thought and Action. *Sustainability (Switzerland)*, *15*(3). https://doi.org/10.3390/su15032366

Zheng, X. (2024). Construction of an innovative entrepreneurship project learning platform introducing a group recommendation algorithm for college students. *Entertainment Computing*, 100666. https://doi.org/10.1016/j.entcom.2024.100666

Zhou, M., Qiao, Y., & Guo, J. (2024). Research on the mechanism involved in urban social inclusiveness and resident entrepreneurship: Evidence from China. *Cities*, *149*. https://doi.org/10.1016/j.cities.2024.104978

Zhu, R., Liu, Z., Zhao, G., Huang, Z., & Yu, Q. (2023). The impact of institutional management on teacher entrepreneurship competency: The mediating role of entrepreneurial behaviour. *International Journal of Management Education*, *21*(2). https://doi.org/10.1016/j.ijme.2023.100794