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Article

The mediating effect of entrepreneurial action learning on the relationship between entrepreneurial orientation and entrepreneurial performance: A case study based on Chinese SMEs

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Abstract: Entrepreneurial Orientation (EO) emphasizes the identification and exploitation of business opportunities, while entrepreneurial action learning (EAL) underscores the acquisition of knowledge through practical experience and continuous improvement. Breakthroughs in both aspects contribute to maintaining flexibility, adapting to changes, and enabling success in competitive markets. The key to the development of small and medium-sized enterprises (SMEs) lies in a clear Entrepreneurial Orientation, a focus on Entrepreneurial Action Learning, and the cultivation of innovation spirit through continuous practice and experience accumulation, thereby enhancing entrepreneurial performance (EP). This study aims to explore the impact of Entrepreneurial Orientation on the Entrepreneurial Performance of SMEs, clarify the mediating role of Entrepreneurial Action Learning between Entrepreneurial Orientation and Entrepreneurial Performance, and investigate the variability of Entrepreneurial Performance among different industries. By means of data collection from 598 SMEs, data analysis was conducted using Structural Equation Modeling (SEM) and Analysis of Variance (ANOVA). The analysis results indicate that entrepreneurial orientation has a positive impact on entrepreneurial action learning and entrepreneurial performance, and entrepreneurial action learning has a positive impact on entrepreneurial performance. The study also found that entrepreneurial action learning partially mediates the relationship between entrepreneurial orientation and entrepreneurial performance. There are certain differences in entrepreneurial performance among different industries. This study enriches the relevant literature in the field of entrepreneurship. Additionally, research on entrepreneurial orientation, entrepreneurial action learning, and entrepreneurial performance in specific regional contexts is very limited, making this study valuable for subsequent research in related areas.

Keywords: entrepreneurial orientation; entrepreneurial action learning; entrepreneurial performance; SMEs; mediation effect

1. Introduction

Small and Medium-sized Enterprises (SMEs) play a crucial role in the economic growth of both developed and developing countries, particularly in areas such as job creation, GDP growth, and income redistribution (Nurudeen et al., 2024). Globally, a significant number of SMEs fail to sustain operations, with nearly half experiencing losses within the first five years. The cumulative losses over the first decade are even more staggering, reaching up to two-thirds of Nikolić et al. (2018). Nasir et al. (2017) and Yoshino (2016) say it is widely believed that a lack of

entrepreneurial capabilities is a primary factor restricting the development of SMEs. This is based on the issues faced by SMEs development before the COVID-19 pandemic. The COVID-19 pandemic swept across the globe in 2019, bringing unprecedented challenges to global economic development, while also altering business activities and mindset (Susanto et al., 2023). For SMEs, entrepreneurial initiatives can be considered, such as repositioning and focusing on innovative resources to discover viable solutions, and making adjustments based on new customer needs and expected experiences. Additionally, they may need to reshape their business models to adapt to market changes and utilize technology to improve product manufacturing or service delivery processes (Manyati and Mutsau, 2021). With the significant role of SMEs in the economy, coupled with the current reality, research on various issues related to SMEs is becoming increasingly prevalent in various fields (Budiarto et al., 2024; Susanto et al., 2023)). Given the important role of SMEs and the specific challenges they currently face, there is a growing interest among researchers in exploring how to enhance the entrepreneurial performance of SMEs. By formulating innovative and flexible strategies, as well as fostering employee engagement in entrepreneurial learning and practice, organizations can better adapt to market changes and achieve sustainable development. Therefore, in the process of strategic design and implementation within organizations, careful consideration of factors such as Entrepreneurial Orientation (EO) and Entrepreneurial Action Learning (EAL) may be crucial in addressing the aforementioned issues.

This study elucidates the interrelationships among EO, EAL, and EP of SMEs, based on the Resource-Based View (RBV) and Organizational Learning Theory (OLT). The RBV theory of Barney (1991) provides a framework for understanding firm competitive advantage, emphasizing the importance of internal resources and capabilities. OLT underscores the importance of continuous learning for firms to cope with uncertain environments (Dodgson, 1993). In the face of uncertainty, companies can enhance their performance by acquiring new knowledge and skills through learning, enabling them to better adapt to environmental changes. Therefore, learning is not only a crucial means of acquiring heterogeneous knowledge but also one of the important ways to achieve sustainable competitive advantage. EO is considered one of the key measures for enhancing firm performance, particularly for SMEs (Aftab et al., 2022). Miller (1983) regards EO as a key resource for firms for assessing their entrepreneurial capabilities. EO focuses on firms' proactive responses to the external environment (Covin and Wales, 2019), while EAL emphasizes firms' learning and adaptation during the entrepreneurial process (Dimov, 2007). Barney and Clark (2007) point out that companies achieve competitive advantage by actively seeking and leveraging new business opportunities and integrating and allocating resources. They acquire experience through action learning, which is interconnected with the accumulation of resources and the enhancement of capabilities. This approach enables companies to implement sustainable business practices, thereby contributing to sustainable performance (Mokbel et al., 2024). By using the RBV theory, Jeong and Chung (2023) elucidate the positive roles of internal and external social capital in marketing innovation, competitive advantage, and financial performance of SMEs in the export market of South Korea.

Given the widespread applicability of the RBV theory, Kruesi and Bazelmans (2023) call for enhanced research on this theory and advocate research methods beyond Western perspectives. The Chinese economy is one of the globally significant topics of interest. Like other countries, SMEs are the backbone of the Chinese economy, serving as crucial pillars for its resilience and employment, which are vital for overall economic and social development. In China, SMEs contribute to over 50% of tax revenue, generate over 60% of the GDP, account for over 70% of invention patents, provide over 80% of urban employment opportunities, and constitute over 99% of the total number of enterprises. As an important economic hub in Southwest China, Sichuan Province possesses vast market potential and abundant resource advantages. SMEs play a significant role in entrepreneurial activities in Sichuan Province (Statistics, 2020). Research on the development of SMEs in this region holds crucial significance for the overall development of the Chinese economy.

The purpose of this study is to fill identified knowledge gaps, provide deeper insights into relevant fields, and offer valuable insights for both academia and practice. By delving into the mechanisms through which EO and EAL influence on EP of SMEs, the aim is to provide new theoretical perspectives and practical guidance for the development and management of SMEs. The use of EO as a predictor of EP has been confirmed in multiple studies (Aftab et al., 2022b; Asad et al., 2024; Ince et al., 2023). However, there is relatively few research on the impact of EO on EP by using EAL as a mediating variable. Despite numerous studies in the entrepreneurship field, research on specific regions and types of enterprises remains relatively scarce. Therefore, this study aims to contribute to filling this research gap, providing a more specific and in-depth understanding of the entrepreneurial environment in the region.

Therefore, this study aims to answer the following questions through further empirical research:

Question 1: Does EAL mediate the relationship between EO and the EP of SMEs?

Question 2: Is there variance in EP among different industries?

2. Theoretical background and hypothesis development

2.1. Theoretical foundation

Resource-Based View (RBV) is considered one of the most representative theories in the field of strategic management (Barney, 1991), initially proposed by Wernerfelt (1984), and has a significant influence in the entrepreneurship domain. From the perspective of performance, the RBV theory is highly relevant because it emphasizes internal capabilities, which are crucial for achieving competitive advantage and enhancing firm performance (Barney, 1991). If SMEs appropriately invest in internal resources, performance is likely to improve (Meekaewkunchorn et al., 2021).

The organizational learning theory (OLT) was introduced by March and Simon (1958), who conceptualized it as a form of learning that enhances both the short-term and long-term performance of businesses. OLT emphasizes learning as a key driver

of competition, employed to address market and technological uncertainties (Dodgson, 1993). Argyris and Schon (1974) systematically discussed organizational learning from an action perspective, summarizing it as a process of self-diagnosis and error retrieval, leading to correction and updating. Crossan et al. (1999) suggest that organizational learning is the result of the interaction between actors' cognition and behaviour, where cognition can influence the occurrence of the behaviour, and behaviour can also reshape cognitive attitudes. Voudouris et al. (2011) view organizational learning as a process of knowledge evolution, forming the foundation for the successful implementation of corporate strategic visions. Xu (2022) regards organizational learning as an ongoing process of self-improvement, particularly focusing on the refinement and adjustment of initial decisions.

RBV considers EO as one of the internal resources for firms to establish competitive advantages (Barney, 1991), playing a crucial role in maintaining competitiveness in the market (Arshad et al., 2020). OLT emphasizes that organizations should acquire, share, and utilize knowledge to adapt to changing environments and enhance organizational performance and competitiveness through learning. Therefore, this study leverages RBV and OLT to construct a theoretical framework for investigating the relationship between EO, EAL, and EP.

2.2. Entrepreneurial Orientation (EO) and Entrepreneurial Performance (EP)

EO refers to the attitudes and tendencies of business managers or entrepreneurs towards innovation, risk-taking, and the pursuit of opportunities. This concept was first proposed by Miller (1983), who also interpreted entrepreneurial firms as structures with a singular dimension characterized by innovation, proactiveness, and risk-taking factors. Baker (1980) expanded the concept of entrepreneurship to encompass the preferences of top management for risk-taking, innovativeness, and assertiveness, which significantly influenced later theories of EO. Stopford and Baden-Fuller (1990) divided EO into individual, organizational, and societal aspects, while Lumpkin and Dess (1996) defined EO as "the processes, practices, and decision activities that lead to new entry (creation) or innovation (renewal) of existing firms." Aftab et al. (2022) state that EO refers to a focus on innovation and proactive utilization of opportunities when making risky decisions, enabling firms to surpass competitors. Based on previous researches and considering the Chinese economic environment, this study incorporates four dimensions of EO: collaborative innovation, risk-sharing, proactive action, and dynamic competition (Fang, 2018).

EP is a measure of the outcomes and effects of a firm's entrepreneurial activities (Wiklund and Shepherd, 2005). EO, as one of the internal resources for firms to establish competitive advantages (Barney, 1991), plays a crucial role in enhancing firm performance (Miller, 1983). It plays a key role in the development of SMEs (Susanto et al., 2023), encompassing various aspects of establishing, integrating, and readjusting internal and external environments. EO enables firms to survive in challenging environments and helps cultivate entrepreneurial capabilities, thus promoting improvements in firm performance. The investigation of EO as a precursor variable to EP is evident in numerous literature. Studies indicate that EO

plays a crucial role in enhancing firm performance (Aftab et al., 2022b; Pulka et al., 2021; Susanto et al., 2023)), with most research findings demonstrating a significant positive correlation between EO and performance (Aftab et al., 2022). The causal relationship between EO and EP enhancement mechanisms remains a complex issue that requires further investigation (Milovanović et al., 2023), particularly across different organizations and environments, such as some studies in China not finding a positive correlation between EO and performance (Zhao et al., 2011). Another study analyzed past research on EO and performance, revealing a significant positive correlation between EO and performance, although out of 51 articles, 4 reported non-significant or mixed results (Rauch et al., 2009). The conclusion drawn from this study is that while the overall connection between firm performance and the performance of SMEs is significant, the value of this connection may vary depending on the research context (Rauch et al., 2009). Therefore, considering the relevant literature, we propose the following hypothesis:

H1: EO has a positive effect on the EP of SMEs.

2.3. The mediating role of entrepreneurial action learning (EAL)

According to OLT, organizational learning is considered a critical dynamic process aimed at enhancing firm performance, whether in the short or long term (March and Simon, 1958). Dodgson (1993) emphasizes that organizational learning is crucial for coping with market and technological uncertainties as it enables organizations to adapt to and cope with changes, thus maintaining competitive advantages in competitive environments. According to relevant research, it is undeniable that there is a certain gap between the educational level of entrepreneurs and the skills required to tackle entrepreneurial challenges (Bierly and Chakrabarti, 1996). Entrepreneurs, in the process of entrepreneurship and business management, inevitably enhance their abilities continuously to narrow the gap with the required skills, aiming to facilitate the growth of their enterprises (Clarysse and Moray, 2004). Therefore, scholars generally agree that entrepreneurship is not a static process but rather a continuous learning process for entrepreneurs, which has led to the emergence of EAL (Xu, 2022).

Within the framework of OLT, EAL is introduced as an important variable. Young-Ybarra and Wiersema (1999) analyzed EAL from a learning perspective. They point out that in the entrepreneurial process, the capabilities of entrepreneurs are constantly evolving. Continuous learning, reflection, summarization, and integration of knowledge are key to entrepreneurs' rational use of knowledge and abilities. Rae and Carswell (2001) point out that the experiences accumulated by entrepreneurs during the entrepreneurial process, their visions for future development, and their expectations for actual outcomes have a significant impact on EAL. Minniti and Bygrave (2001) suggest that EAL is an evolving process involving stages such as information processing, trial, updating decision patterns, and improving performance. Throughout this process, entrepreneurs undergo steps such as cognition, reflection, communication, and application. Building upon previous research, Xu (2022) summarizes the essence of action learning into the following two points: First, it focuses on learning situations, starting from the internal and

extending to the external context. Second, it emphasizes a progression from simplicity to complexity, highlighting the iterative nature of the learning process.

The relationship between EO and EAL can be explained through the lens of the RBV and OLT. According to the RBV, a firm's competitive advantage stems from its resources and capabilities (Barney, 1991). Within this framework, EO can be seen as a resource, representing a significant asset for the firm. Through EO, firms can discover and exploit new market opportunities, and actively mobilize internal and external resources, thereby enhancing competitiveness and performance (Susanto et al., 2023). Furthermore, OLT regards organizational learning as an ongoing process of self-improvement Xu (2022). EAL, as a form of organizational learning, emphasizes the acquisition of knowledge, experience, and skills through practice and action to adapt to constantly changing environments. In the entrepreneurial process, entrepreneurs continuously experiment, reflect, and adjust their actions through this learning process to enhance the adaptability and competitiveness of the enterprise. Finally, according to OLT, learning is one of the important ways to improve organizational performance (March and Simon, 1958). EAL enables firms to better adapt to changes in the external environment, and identify and exploit market opportunities more quickly, thus enhancing firm performance. Therefore, the following hypotheses are proposed:

H2: EO has a positive influence on EAL.

H3: EAL has a positive influence on the EP of SMEs.

Literature suggests that EO affects EAL, which in turn affects EP (Fang, 2018). Based on this, the following hypothesis is proposed:

H4: EAL mediates the relationship between EO and EP of SMEs.

Based on the above description, the conceptual framework of this study is illustrated in **Figure 1**. The conceptual framework includes EO, EAL, and EP. EO and EAL are independent variables, EP is the dependent variable, and the framework considers the mediating role of EAL between EO and EP.

Based on the above descriptions, the conceptual framework of this study is shown in **Figure 1**. The conceptual framework includes EO, EAL, and the EP of SMEs. EO and EAL are independent variables, and the EP of SMEs is the dependent variable. At the same time, this framework considers the mediating role of EAL between EO and EP.

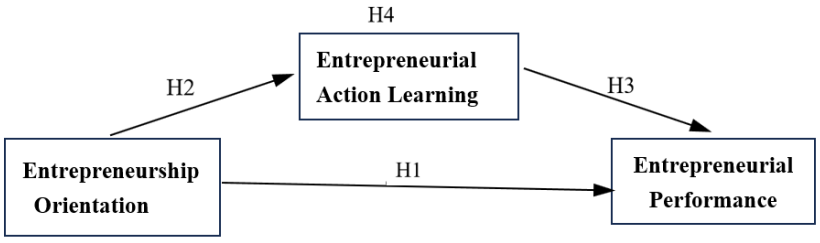

Figure 1. The conceptual framework.

3. Research methodology

3.1. Population and sample size

This study selected SMEs in Sichuan province as the subjects of the questionnaire survey. The chosen enterprises for the survey have been in existence for more than six months (Biggadike, 1989; Carpenter and Westphal, 2001), Companies established for over six months have passed the developmental transition period, and their operations have stabilized, allowing for the implementation of a well-established management system and EO. Based on the Chinese government's classification standards for SMEs, including enterprise size, ownership form, and industry characteristics China, and the National Economy Industry Classification and Code of China (GB/T 4754-2017), which covers 19 industry sectors (China, 2022; NBS, 2017), this study selected four industries with a substantial number of enterprises as the scope for sample selection. These four industries include wholesale and retail trade, agriculture, forestry, animal husbandry, and fishery, public administration, social security, social organizations, and manufacturing.

In this study, a questionnaire survey was distributed to managers from SMEs in Sichuan province. The participants included frontline managers, middle managers, senior managers, and company founders, all of whom were knowledgeable about the company's operations. All participants agreed to answer the questionnaire. To ensure a reasonable and representative sample selection, a total of 700 questionnaires were distributed, resulting in 600 responses. After removing incomplete and missing questionnaires, the final dataset consisted of 595 valid responses, yielding an effective questionnaire recovery rate of 85%. The sample size meets the requirements of at least 500 samples for a structural equation model (Kline, 2023).

3.2. Questionnaire design and instruments

The questionnaire consists of two parts. The first part gathers basic information about the respondents, including personal information and the business performance of their respective units. The second part focuses on the respondents' opinions regarding EO, EAL, and EP. The detailed questionnaire information is provided in the appendix. EO is measured based on the research by Miller (1983) and Fang (2018), using four dimensions: Collaborative Innovation, Leading Mobility, Risk Sharing, and Dynamic Competition, with a total of 12 items. EAL utilizes the scale developed by Fang (2018), measuring three dimensions: exploratory learning, transformative learning, and developmental learning, with a total of 11 items. EP is measured using scales from Prajogo and Ahmed (2006) and Jaworski (1993) covering three aspects: growth performance, profitability performance, and overall performance, with a total of 11 items. All items in the questionnaire are assessed using a Likert five-point scale, ranging from "strongly disagree" to "strongly agree."

3.3. Statistical techniques

The suitability of the sample data for validated factor analysis was determined by calculating the alpha coefficients of the sample data by using SPSS 26.0.

The leading AMOS 23.0 software was used to analyze the questionnaire data through SEM (SEM) for comprehensive assessment of model fit, estimation of path coefficients, model modification, and validation of causality. The variability of EP among different industries was investigated through a one-way analysis of factors.

4. Results

4.1. Demographic characteristics of respondents

The demographic characteristics of the respondents are presented in **Table 1**. Among the respondents, 55.30% were male, while 44.70% were female. Respondents aged between 20 and 30 years old accounted for 43.20% of the total, and those with a bachelor's degree constituted 37.30%. Regarding the distribution of collected questionnaires across different industries, the proportions were as follows: 27.40% from the wholesale and retail industry, 21.20% from agriculture, forestry, animal husbandry, and fishing, and 25.70% each from public administration, social security organizations, and the manufacturing industry.

Table1. Respondent's information (N = 595).

Item	Item type	Sample size	Percentage
Sex	Male	329	55.30%
	Female	266	44.70%
Age	Below 20 years old	24	4.00%
	20–30 years old	257	43.20%
	31–40 years old	147	24.70%
	41–50 years old	137	23.00%
	Above 51 years old	30	5.00%
Educational level	Specialized and below	186	31.30%
	Undergraduate	222	37.30%
	Master's Degree	170	28.60%
	Doctoral student	17	2.90%
Industry category	Wholesale and retail trade	163	27.40%
	Agriculture, forestry, animal husbandry and fisheries	126	21.20%
	Public administration, social security and social organizations	153	25.70%
	Manufacturing	153	25.70%

4.2. Reliability analysis

Reliability Analysis was conducted using SPSS26.0 on the data, and the results indicate that Cronbach's alpha values for each factor range from 0.885 to 0.904, exceeding the standard of 0.6 (George and Mallery, 2003). This suggests that the dimensions of the model are reliable, and the fit is satisfactory. The KMO value is 0.915 and in Bartlett's Test of Sphericity, the approximate chi-square value is 10904.812 with 561 degrees of freedom and a significance level of 0.000, indicating significance. Therefore, the results confirm the reliability of the latent variables.

To verify the normal distribution of the data, SPSS 26.0 was employed to conduct tests on the means, standard deviation, skewness, and kurtosis of the three variables: EO, EAL, and EP. The test results are presented in **Table 2**. The results indicate that the range of standard deviation is between 1.054 and 1.169, and the skewness and kurtosis are within the range of −1 to 1 (with very small deviations beyond this range). It can be observed that the data for each indicator conform to a

normal distribution (Kline, 2023).

Table 2. Cronbach's alpha values.

Variables	Mean	Alpha	S.D.	Skewness	Kurtosis
EO	3.424	0.779	1.169	0.404	−1.011
EAL	3.478	0.772	1.082	0.338	−1.078
EP	3.467	0.754	1.054	0.317	−1.013

To assess the model fit of EO, EAL, and EP, confirmatory factor analysis (CFA) was conducted separately for each variable, and the fit results are presented in **Table 3**. The results indicate that the indices for each variable fall within the acceptable range, demonstrating a good fit for the model.

Table 3. Fit Indices for factor analysis of EO, EAL, EP.

Fit indexes	Good index	Model (EO)	Model (EAL)	Model (EP)
$\chi 2$		67.462	68.393	68.623
Df		48.000	41.000	41.000
$\chi 2/Df$	$0 \leq \chi^2/df \leq 2$	1.405	1.666	1.674
RMSEA	$0 \leq RMSEA \leq 0.05$	0.026	0.033	0.034
CFI	$0.95 \leq CFI \leq 1.00$	0.995	0.992	0.990
GFI	$0.95 \leq GFI \leq 1.00$	0.981	0.980	0.979
AGFI	$0.95 \leq AGFI \leq 1.00$	0.970	0.968	0.967

To measure the internal consistency and correlation between variables, it is necessary to calculate the values of AVE and C.R. for each observed variable. The results are presented in **Table 4**. Both AVE and C.R. values are suitable for further analysis.

Table 4. Convergent and discriminant validity.

Constructs	Items	Factor Loadings	C.R.	AVE
Entrepreneurship Orientation (EO)				
Collaborative Innovation (CI)	CI1	0.787	0.816	0.596
	CI2	0.779		
	CI3	0.750		
Leading Mobility (LM)	LM1	0.834	0.836	0.629
	LM2	0.783		
	LM3	0.761		
Risk Sharing (RS)	RS1	0.821	0.846	0.648
	RS2	0.801		
	RS3	0.792		

Table 4. (*Continued*).

Constructs	Items	Factor Loadings	C.R.	AVE
Dynamic Competition (DC)	DC1	0.876	0.902	0.755
	DC2	0.859		
	DC3	0.871		
Entrepreneurial action learning (EAL)				
Exploratory learning (EL)	EL1	0.809	0.886	0.661
	EL2	0.819		
	EL3	0.826		
	EL4	0.797		
Transformative learning (TL)	TL1	0.800	0.835	0.627
	TL2	0.790		
	TL3	0.786		
Developmental learning (DL)	DL1	0.820	0.872	0.630
	DL2	0.809		
	DL3	0.769		
	DL4	0.775		
Entrepreneurial performance (EP)				
Growth performance (GP)	GP1	0.706	0.833	0.555
	GP2	0.781		
	GP3	0.747		
	GP4	0.744		
Profitability performance (PP)	PP1	0.786	0.852	0.590
	PP2	0.740		
	PP3	0.762		
	PP4	0.782		
Overall performance (OP)	OP1	0.734	0.795	0.564
	OP2	0.760		
	OP3	0.759		

Discriminant validity analysis was conducted among the variables using SPSS 26.0, and the results are presented in **Table 5**. The results indicate that the square root of AVE for each variable is greater than the correlation coefficients with other variables. Therefore, it can be inferred that the three variables exhibit good discriminant validity.

Table 5. Correlation analysis and AVE values between variables.

Constructs	CI	LM	RS	DC	EL	TL	DL	GP	PP	OP
CI	**0.773**									
LM	0.434	**0.793**								
RS	0.501	0.477	**0.805**							
DC	0.458	0.488	0.482	**0.869**						
EL	0.289	0.296	0.283	0.235	**0.813**					

Table 5. (*Continued*).

Constructs	CI	LM	RS	DC	EL	TL	DL	GP	PP	OP
TL	0.288	0.331	0.290	0.262	0.509	**0.792**				
DL	0.274	0.289	0.307	0.256	0.562	0.521	**0.794**			
GP	0.299	0.295	0.318	0.239	0.271	0.314	0.269	**0.745**		
PP	0.310	0.246	0.244	0.283	0.227	0.227	0.215	0.561	**0.768**	
OP	0.245	0.286	0.308	0.225	0.253	0.242	0.205	0.500	0.461	**0.751**

Note: The diagonal represents the square root of the AVE for each variable, and the off-diagonal elements represent the correlation coefficients between variables.

4.3. Structural equation model

Structural Equation Model (SEM) has been empirically used to identify the existence of intermediate relationships between variables (Namazi and Namazi, 2016). The model's fit indices were examined using AMOS23, and the structural equation model is depicted in **Figure 2**.

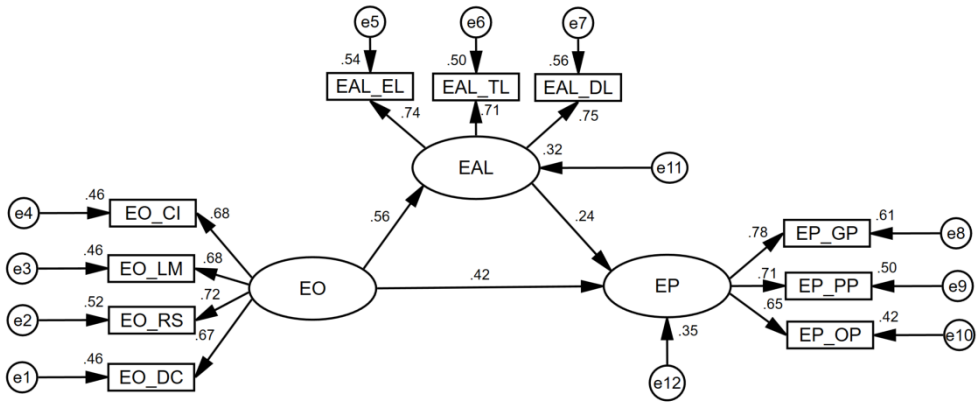

Figure 2. SEM analysis.

The results in **Table 6** indicate a relative chi-square value of 1.243 and an RMSEA of 0.02, meeting the standard of less than 0.08 (Pedhazur and Schmelkin, 2013). The values of CFI, GFI, NFI, TLI and AGFI also meet the criterion proposed by Hair et al. (2009) being greater than 0.90. All indices demonstrate an excellent fit for the model.

Table 6. Fit indices results of SEM (default model).

Items	**Criteria**	**Value (Independent model)**	**Value (Default model)**
X^2/Df	<3	40.923	1.243
RMSEA	<0.08	0.259	0.020
CFI	>0.9	0.000	0.996
GFI	>0.9	0.480	0.987
NFI	>0.9	0.000	0.978
TLI	>0.9	0.000	0.994
AGFI	>0.9	0.364	0.978

4.4. Path analysis in the model

4.4.1. Direct effects

Regarding direct effects, Wang et al. (2020) indicate that a path coefficient below 0.1 represents a small effect, around 0.3 signifies a moderate effect, and above 0.5 indicates a large effect. The results demonstrate that EO has a significantly positive impact on EAL (CR value is 6.273; $p < 0.01$), supporting H1. EO also has a significantly positive impact on EAL (CR value is 9.480; $p < 0.01$), confirming H2. Additionally, EAL has a significantly positive impact on EP (CR value is 3.707; $p < 0.01$), thus supporting H3. These results are summarized in **Table 7**.

Table 7. Direct effect results.

Hypotheses	Path	Estimate	S.E.	C.R.	*p*-value
H1	EP ← EO	0.422	0.059	6.273	***
H2	EAL← EO	0.563	0.052	9.480	***
H3	EP ← EAL	0.237	0.063	3.707	***

Note: *** *p*-value < 0.01.

4.4.2. Indirect effects

Indirect effects are associated with regression coefficients between variables. In this context, the path coefficient for H1 is 0.42, indicating a moderate effect; for H2, the path coefficient is 0.56, signifying a large effect, and for H3, the path coefficient is 0.24, representing a small effect. Within the structural equation model, the mediating effect of EAL in the relationship between EO and EP was examined. The results indicate that EO has a significant indirect impact on EP through the mediation of EAL. Thus, EAL fully mediates the relationship between EO and EP. Therefore, H4 is supported. The results of the indirect effects are presented in **Table 8**.

Table 8. Indirect effect results.

Hypothesis	Standardized indirect effect	*p*-value
H4	0.133	***

Note: *** *p*-value < 0.01.

4.5. Comparison of EP across different industries

To investigate the differences in EP across various industries, this study employed a test of significance for differences. Using SPSS26 and employing one-way analysis of variance (ANOVA), the analysis revealed that the performance in wholesale and retail, agriculture, forestry, animal husbandry, and fisheries, as well as manufacturing, was significantly higher than that in public management, social security, and social organizations. The results of the analysis are presented in **Table 9**. This difference may be related to the nature of the industry itself and the competitive market environment. For industries primarily dealing with physical products, such as wholesale retail and agriculture, innovation and market orientation are more likely to have a significant impact on performance. In contrast, service-oriented industries like public management may be constrained by institutional and policy factors, resulting in relatively lower performance levels.

Table 9. Analysis results of differences in ep across industry categories.

Variable	Industry Classification	Number of cases	Average	Standard deviation	F	*p*-value
EP	Wholesale and retail trade	163	3.547	0.837	9.461	0.000***
	Agriculture, forestry, animal husbandry and fisheries	126	3.534	0.88		
	Public Administration, Social Security and Social Organizations	153	3.159	0.829		
	Manufacturing	153	3.633	0.843		

Note: *** *p*-value < 0.01.

5. Research conclusions and recommendations

5.1. Discussion

This study aims to examine the influence of EO and EP on SMEs. The results indicate that EO has a significant positive effect on the EP of SMEs (H1), which is consistent with previous research findings (Dwumah et al., 2024; Ince et al., 2023; Isichei et al., 2020)). This finding supports the resource management theory, which suggests that EO is one of the crucial managerial resources required for firm survival (Dwumah et al., 2024). If firms can fully utilize this resource, it will contribute to enhancing their performance levels (Li et al., 2022).

Additionally, EO has a significantly positive effect on EAL (H2). This finding is consistent with previous research (Fang, 2018; Meekaewkunchorn et al., 2021). This phenomenon can be explained using the RBV and OLT. The RBV emphasizes the importance of internal resources for organizational performance (Barney, 1991), and EO, as an internal managerial resource capability, provides the foundation for supporting and driving EAL by promoting innovation, flexibility, and adaptability within the organization. On the other hand, OLT emphasizes that organizations adapt to environmental changes by continuously accumulating knowledge and experience (Voudouris et al., 2011). EO, meanwhile, provides a positive learning atmosphere and mechanism, facilitating organizational members' learning and reflection in entrepreneurial activities, thereby enhancing their adaptability and competitive advantage.

The research indicates that EAL has a significantly positive effect on the EP of SMEs (H3). This finding is consistent with previous research (Sawaean and Ali, 2020). OLT suggests that organizations adapt to environmental changes and improve performance by continuously acquiring, sharing, and utilizing knowledge and experience (Dodgson, 1993). In this context, EAL, as a form of the organizational learning process, provides opportunities for entrepreneurs and organizational members to continuously improve entrepreneurial behaviour and enhance EP through the accumulation of practical experience, reflection, and adjustment.

The research results demonstrate that EAL significantly mediates the relationship between EO and EP of SMEs (H4). This finding indicates that EAL significantly influences how EO enhances the EP of SMEs (Chen et al., 2017; Fang, 2018; Meekaewkunchorn et al., 2021)). The RBV emphasizes the importance of resources (Barney, 1991), and EAL, as a learning process (Xu, 2022), assists individuals and organizations in effectively acquiring, integrating, and utilizing these

resources. Through EAL, individuals and organizations can better adapt to changes in the external environment, enhancing competitiveness (Young-Ybarra and Wiersema, 1999), and thereby impacting EP. EAL, as a learning process, can help businesses adapt better to dynamic environments and foster organizational innovation and development, thereby influencing EP. Therefore, this research result combines RBV and OLT, illustrating that the mediating role of EAL between EO and EP of SMEs is achieved through effective management and learning of resources.

Additionally, the research results also indicate differences in EO among different industries, which align with the findings of McKenny et al. (2018) regarding variations in EP across different industries.

5.2. Significance of the study

In the post-pandemic era, the development of SMEs faces unprecedented challenges. In this study, we delve into the relationship between EO, EAL, and EP among SMEs in Sichuan Province. EO, as a core element of corporate strategy, can guide businesses to better adapt to market demands and innovation opportunities, thereby enhancing EP. Additionally, EAL, as a proactive learning approach, helps businesses adapt to changes rapidly, learn from experiences, and consequently, promote improvements in EP. The study also reveals the mediating role of EAL between EO and EP in SMEs. This implies that EO indirectly influences EP through the process of EAL. Therefore, while pursuing EO, businesses should focus on nurturing and facilitating EAL to maximize the positive impact of EO on EP (Pedhazur and Schmelkin, 2013).

Taking into account the characteristics of different industries, businesses should formulate targeted management strategies. For industries with higher performance such as wholesale and retail trade, agriculture, forestry, animal husbandry, and fisheries, greater emphasis should be placed on market orientation and continuous learning. On the other hand, for sectors like public administration, social security, and social organizations, performance levels can be enhanced through methods such as improving service quality and optimizing management systems.

Based on the above research findings, we believe that by comprehensively promoting EO and EAL and formulating targeted management strategies based on the characteristics of different industries, the EP of SMEs can be effectively enhanced, thus driving sustainable economic development. This study is based on the principles of RBV and OLT, both of which reveal the importance of effectively managing resources and learning in the process of enhancing EP of SMEs. This concomitant development of the two theories provides a more comprehensive theoretical framework for explaining entrepreneurial behaviour and improving the performance of SMEs.

5.3. Limitations and future research directions

Firstly, this study employed a cross-sectional design, which means that the results obtained from the collected data only reflect the situation at a specific point in time and may not fully capture the dynamic changes of each variable. To address this limitation, future research could consider using longitudinal data collection methods

to obtain comprehensive causal relationships and dynamic impact mechanisms. Additionally, there are limitations in sample selection. The sample in this study only includes four industries of SMEs in the Sichuan Province of China. Future research could encompass sample data from different countries and industries to enhance the generalizability of the research findings.

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Appendix A

Label	Statements
Collaborative Innovation	
CI1	Since its establishment, the company has launched numerous new products or services in response to changing environments.
CI2	Since its inception, the company has made significant changes to its product or service portfolio
CI3	The entrepreneur places great emphasis on research and development and technological innovation.
Leading Mobility	
LM1	Entrepreneurs attach great importance to research and development, striving for technological and service leadership and innovation
LM2	Within the industry, entrepreneurs are capable of introducing new products, services, management concepts, and production technologies ahead of others
LM3	Within the industry, entrepreneurs are capable of introducing new products, services, management concepts, and production technologies ahead of others
Risk Sharing	
RS1	Entrepreneurs tend to prefer projects with potential returns but lower risks.
RS2	Entrepreneurs lean towards projects that offer potential returns but lower risks.
RS3	To achieve entrepreneurial performance, entrepreneurs are inclined towards adopting relatively swift actions.
Dynamic Competition	
DC1	Entrepreneurs adopt an assertive competitive stance and challenge competitors actively.
DC2	Entrepreneurial enterprises are highly competitive and aggressive.
DC3	Entrepreneurs exhibit a strong inclination to surpass competitors to enhance their competitive position.
Exploratory learning	
EL1	Enterprises excel in comprehensive and multi-system exploratory thinking, thereby mastering entrepreneurial knowledge and abilities.
EL2	Entrepreneurial enterprises are adept at referencing, imitating, and learning from the accomplishments of larger companies or foreign pioneers.
EL3	Entrepreneurial enterprises are adept at engaging in communication activities with customers to understand their needs.
EL4	Entrepreneurial enterprises are skilled at gathering relevant information about competitors to understand their business strategies.
Transformative learning	
TL1	Entrepreneurial enterprises foster an atmosphere that encourages the sharing of experiences and lessons learned.
TL2	Entrepreneurial enterprises promote a culture of sharing experiences and lessons learned.
TL3	Entrepreneurial enterprises have formal rules for identifying misconceptions or erroneous notions in their operations.
Developmental learning	
DL1	Entrepreneurial enterprises excel at transforming technical knowledge into new products.
DL2	Entrepreneurial enterprises frequently align new technologies with new products.
DL3	Entrepreneurial enterprises can swiftly identify how new technical knowledge complements existing knowledge.
DL4	Entrepreneurs in the company are aware of who the adept developers of new technologies are within the organization.

Appendix B

Label	Statements
Growth performance	
GP1	Rapid growth in the number of employees.
GP2	The rapid development pace of new products or services.
GP3	Fast growth in market share.
GP4	A large proportion of total sales revenue is from sales of new products or services.
Profitability Performance	
PP1	High net profit margin of entrepreneurial enterprises (Net profit / Total sales revenue).
PP2	High return on investment of entrepreneurial enterprises
PP3	The fast growth rate of net profits for entrepreneurial enterprises.
PP3	Rapid growth in total sales revenue of entrepreneurial enterprises.
Overall Performance	
OP1	Formulating products or services that can be sold.
OP2	The technologically developed products or services that have already been sold.
OP3	Attaining profit margins exceeding the industry average.