The Role of Entrepreneurial Mindset and Grit in Overcoming Innovation Barriers: A Study of Self-Employed Vocational Graduates

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Abstract

This study examined the relationships between entrepreneurial mindset, grit, innovative barriers, and the self-employed performance of graduates from higher vocational colleges in Yunnan Province, China. Using a mixed-methods research approach, the study aimed to (1) investigate the influence of grit and innovative barriers on self-employed graduates' performance, (2) analyze the model between entrepreneurial mindset, grit, innovative barriers, and self-employed graduates' performance, and (3) clarify the tested model from the perspective of key stakeholders.

This study utilized an explanatory sequential design to achieve its objectives. The analysis was conducted utilizing PLS-SEM structural and reflective measurement models. The findings showed that all research hypotheses were accepted. The proposed model is the EGIS model. The researcher used theme content analysis and a semi-structured interview with 28 informants to analyze qualitative data. The result found that entrepreneurs prioritize consumer awareness, demands, joy, and proactive marketing. Self-employed service quality and firm management are still affected. It also improves confidence and pride. The informants claimed perseverance helped them move on, reflect, and overcome obstacles. Harmonic enthusiasm requires learning, problem-solving, and goal-setting. Innovation barriers limit help and hurt. Barriers aid change and problem-solving. Informants' paradigm reactions mattered.

Study suggestions involve three parts. Firstly, creative management should focus on managing business owners and enhancing self-performance. Secondly, universities should offer short-term training in creative obstacle management and foster an entrepreneurial mindset among academics. Lastly, further research should explore the interaction effect and other mediating and moderating variables to evaluate how creative obstacles and entrepreneurial mindset impact self-employment performance. Entrepreneurs' tenacity, attitude, and performance can be assessed longitudinally

Introduction

The Chinese government's efforts to encourage entrepreneurship and innovation are also reflected in its 14th Five-Year Plan (2021-2025). The program aims to promote employment, improve citizens' livelihoods and boost economic growth through various channels, especially for university graduates.

Among the self-employed groups, the self-employed employment of Chinese

college graduates has also developed rapidly. A survey with more than 40,000 valid questionnaires shows that from 2020 to 2023, 11.68 percent of Chinese college graduates and would-be graduates will be employed or self-employed in fields related to the digital economy. The survey also found that 88.17 percent are satisfied with their positions (http://en.people.cn). Moreover, the expansion of the digital economy has created new prospects for self-employment, so vocational education programs in China must follow this trend to ensure that students are prepared for the changing labor market. Vocational education creates self-employment with low entry and high profits (Ren, 2020). Vocational education can help the self-employed and improve vocational education and self-employment policies.

Meanwhile, the employment landscape is undergoing a significant transformation, influenced by the rise of the gig economy, digital platforms, and a shift towards more autonomous forms of work (Williams et al., 2023). Vocational university graduates are increasingly considering self-employment as a viable career path, driven by the entrepreneurial mindset and grit that are essential for navigating the complex and dynamic business environment of today (Wu et al., 2022).

Tech-driven globalization and changing labor market dynamics have increased self-employment and entrepreneurship, especially among vocational university graduates. Even if self-employment is becoming more popular, vocational graduates confront distinct challenges that can hinder their performance and sustainability in the entrepreneurial scene.

The complicated interplay between an entrepreneurial mindset, grit, innovative barriers, and the performance of self-employed vocational university graduates is the problem that this research attempts to clarify.

At the same time, an entrepreneurial mindset is advantageous for self-employed. The researcher would like to know about the positive effects of grit on them. Moreover, there are a lot of innovative barriers to self-employed performance; it would work for self-employed students and vocational institutions to understand and prepare to manage challenges For those interested in being successful in self-employed, how exactly can mindsets that encourage initiative and grit influence the performance of a career? Moreover, how might the challenges control the relationship between having an innovative mindset and being competent in the career?

Research Objectives

1.To examine the influence of grit and innovation barriers on self-employed graduates' performance.

2.To analyze the model between entrepreneurial mindset influence, grit, innovative barriers, and self-employed graduates' performance.

3.To clarify the tested model from the perspective of essential stakeholder.

Methodological Approach

Quantitative research is the first stage of the research process, which follows the procedure.

1. Population and Sample

(1) Population

The target population of this study includes individual-operated students who have completed vocational education courses in the past 1 years (2022-2023) from four vocational colleges in different regions of Kunming City, China: Kunming University of Science and Technology, Yunnan University of Finance and Economics, Yunnan Metallurgical Technical College, and Yunnan Textile and Garment Institute.

(2) Unit of analysis

Unit of analysis is the individual.

(3) Sampling Frame

Graduates who completed their vocational education in 2022-2023 and are self-employed or have been for at least six months to ensure they have some self-employment experience.

(4)Sample

4.1) Sample size

There are 11 dimensions in the frame work. The sample size should be 11*20=220 persons. The sample size for this study is 220 respondents. The researcher increased by 40% (Bhat，2024). As a result, the researcher had collected at least 308 persons.

4.2) Sampling technique

This research selects graduates from four regions in Kunming as the study subjects. The researcher employs multi-stage random sampling. There are four stages as follows.

Table1.1 multi-stage random sampling

Locations	University	Self-employed graduate（2021-2022）	Sample size
Kunming	Kunming University of Science and Technology	325	104
	Yunnan University of Finance and Economics and Foreign Studies	150	49
	Yunnan Metallurgy College	315	102
	Yunnan University of Technology	165	53

	Total	955	308

Quantitative finding

Evaluation of the reflective measurement model

1). Outer loading analysis

Outer loading analysis plays an important role in empirical research, helping to evaluate and optimize measurement models, and providing a reliable foundation for subsequent structural model analysis. This is crucial for improving the accuracy and credibility of research results.

Table 1.2 Construct reliability and validity（first order）

First Order Construct	Items	λ	λ^2	α	CR	AVE
EIB	EIB1	0.836	0.699	0.908	0.908	0.684
	EIB2	0.824	0.678			
	EIB3	0.826	0.682			
	EIB4	0.826	0.683			
	EIB5	0.804	0.647			
	EIB6	0.847	0.717			
EPD	EPD1	0.830	0.690	0.893	0.895	0.701
	EPD2	0.857	0.735			
	EPD3	0.852	0.727			
	EPD4	0.848	0.720			
	EPD5	0.797	0.635			
EPF	EPF1	0.821	0.674	0.860	0.862	0.704
	EPF2	0.859	0.737			
	EPF3	0.853	0.727			
	EPF4	0.824	0.679			
EPI	EPI1	0.854	0.729	0.871	0.873	0.721
	EPI2	0.839	0.703			
	EPI3	0.828	0.686			
	EPI4	0.875	0.765			

GH	GH1	0.858	0.736	0.840	0.844	0.676
	GH2	0.792	0.628			
	GH3	0.816	0.665			
	GH4	0.821	0.674			
GO	GO1	0.837	0.700	0.866	0.868	0.713
	GO2	0.839	0.704			
	GO3	0.826	0.682			
	GO4	0.875	0.766			
GP	GP1	0.841	0.707	0.880	0.882	0.736
	GP2	0.843	0.711			
	GP3	0.871	0.759			
	GP4	0.875	0.766			
IIB	IIB1	0.788	0.621	0.888	0.889	0.642
	IIB2	0.793	0.630			
	IIB3	0.769	0.591			
	IIB4	0.827	0.684			
	IIB5	0.819	0.670			
	IIB6	0.808	0.653			
SA	SA1	0.818	0.669	0.885	0.885	0.685
	SA2	0.833	0.694			
	SA3	0.843	0.711			
	SA4	0.826	0.682			
	SA5	0.819	0.671			
SC	SC1	0.838	0.703	0.903	0.904	0.673
	SC2	0.842	0.709			
	SC3	0.837	0.701			
	SC4	0.803	0.645			
	SC5	0.798	0.637			
	SC6	0.802	0.644			
SR	SR1	0.877	0.768	0.884	0.884	0.742
	SR2	0.854	0.729			
	SR3	0.866	0.749			
	SR4	0.850	0.723			

The λ and λ2 values for each first-order dimension are as follows: The λ for the EIB dimension range from 0.804 to 0.847, with corresponding λ2 ranging from 0.647 to 0.717.The λ for the EPD dimension range from 0.797 to 0.857, with corresponding λ2 ranging from 0.635 to 0.735.The λ for the EPF dimension range from 0.821 to 0.859, with corresponding λ2 ranging from 0.674 to 0.737.The λ for the EPI dimension range from 0.828 to 0.875, with corresponding λ2 ranging from 0.686 to 0.765.The λ for the

GH dimension range from 0.792 to 0.858, with corresponding λ2 ranging from 0.628 to 0.736.The λ for the GO dimension range from 0.826 to 0.875, with corresponding λ2 ranging from 0.682 to 0.766.The λ for the GP dimension range from 0.841 to 0.875, with corresponding λ2 ranging from 0.707 to 0.766.The λ for the IIB dimension range from 0.769 to 0.827, with corresponding λ2 ranging from 0.591 to 0.684.The λ for the SA dimension range from 0.818 to 0.843, with corresponding λ2 ranging from 0.669 to 0.711.The λ for the SC dimension range from 0.798 to 0.842, with corresponding λ2 ranging from 0.637 to 0.709.The λ for the SR dimension range from 0.850 to 0.877, with corresponding λ2 ranging from 0.723 to 0.768.

The composite reliability (CR) for all dimensions ranges from 0.860 to 0.908, Cronbach's α(α) coefficients range from 0.840 to 0.908, and the average variance extracted (AVE) ranges from 0.642 to 0.742. These results indicate good internal consistency, reliability, and validity for each first-order dimension.

2）Discriminant validity – HTMT analysis

HTMT analysis helps evaluate the discriminant validity of measurement models, identify collinearity issues, and improve the intrinsic validity and credibility of research results. This is of great significance for improving the quality of research and the interpretability of results.

Table 1.3 Discriminant validity – HTMT（first order）

	EIB	EPD	EPF	EPI	GH	GO	GP	IIB	SA	SC	SR
EIB											
EPD	.382										
EPF	.363	.513									
EPI	.456	.587	.587								
GH	.451	.504	.449	.456							
GO	.404	.405	.417	.367	.479						
GP	.396	.377	.401	.328	.545	.502					
IIB	.532	.440	.320	.434	.479	.338	.366				
SA	.261	.450	.429	.429	.488	.355	.404	.209			
SC	.283	.362	.430	.473	.474	.267	.364	.233	.542		
SR	.354	.445	.294	.440	.488	.322	.417	.255	.572	.532	

HTMT (Heterotrait-Monotrait Ratio) is a method used to assess discriminant validity in structural equation modeling. Discriminant validity refers to the degree to which a latent variable can be distinguished from other latent variables in the model. The HTMT value

is calculated by taking the ratio of the correlations between different latent variables (heterotrait) to the correlations between different items within the same latent variable (monotrait). If the HTMT value is below 0.85 (some studies suggest using 0.90 as the threshold), the model is considered to have good discriminant validity (Henseler, Ringle, & Sarstedt, 2015).

Referring to the table, all the HTMT values are below 0.85, indicating good discriminant validity among the latent variables and supporting the validity of the model.

3）Cross loading analysis

Cross loadings in factor analysis are used to assess the loadings of each observed variable on all potential factors. High cross-loading values indicate that a variable has strong explanatory power on a particular factor, whereas low cross-loading values suggest that the variable has weaker explanatory power on other factors, thereby validating the discriminant validity between factors (Smith et al., 2020; Johnson & Lee, 2021).

Table 1.4 Cross loading

	EIB	EPD	EPF	EPI	GH	GO	GP	IIB	SA	SC	SR
EIB1	0.836	0.243	0.192	0.347	0.324	0.311	0.238	0.416	0.191	0.165	0.260
EIB2	0.824	0.322	0.302	0.368	0.306	0.302	0.318	0.431	0.204	0.197	0.233
EIB3	0.826	0.242	0.223	0.308	0.296	0.256	0.308	0.364	0.166	0.192	0.265
EIB4	0.826	0.330	0.344	0.355	0.358	0.296	0.272	0.386	0.236	0.229	0.237
EIB5	0.804	0.276	0.245	0.264	0.307	0.271	0.295	0.367	0.147	0.195	0.280
EIB6	0.847	0.298	0.288	0.377	0.369	0.339	0.327	0.408	0.217	0.289	0.299
EPD1	0.303	0.830	0.320	0.424	0.384	0.256	0.247	0.320	0.372	0.260	0.339
EPD2	0.298	0.857	0.434	0.433	0.333	0.305	0.273	0.347	0.324	0.264	0.300
EPD3	0.280	0.852	0.393	0.450	0.372	0.367	0.358	0.328	0.323	0.298	0.331
EPD4	0.303	0.848	0.392	0.466	0.370	0.282	0.281	0.313	0.359	0.267	0.364
EPD5	0.257	0.797	0.350	0.398	0.372	0.273	0.241	0.332	0.302	0.272	0.323
EPF	0.28	0.34	0.82	0.40	0.33	0.31	0.30	0.21	0.28	0.28	0.18

1	7	4	1	7	2	9	4	8	0	7	2
EPF	0.22	0.42	0.85	0.45	0.28	0.30	0.26	0.25	0.32	0.30	0.21
2	5	1	9	3	4	4	9	2	8	7	8
EPF	0.33	0.39	0.85	0.45	0.34	0.32	0.32	0.23	0.33	0.35	0.23
3	4	7	3	1	9	4	3	1	1	3	1
EPF	0.23	0.35	0.82	0.39	0.32	0.26	0.27	0.23	0.31	0.32	0.23
4	2	3	4	7	0	2	4	6	7	1	1
EPI1	0.32	0.44	0.45	0.85	0.30	0.24	0.19	0.33	0.32	0.38	0.36
	7	4	3	4	3	0	8	0	1	7	0
EPI2	0.31	0.43	0.39	0.83	0.34	0.23	0.24	0.28	0.29	0.32	0.33
	5	9	7	9	9	1	6	7	3	9	3
EPI3	0.32	0.40	0.39	0.82	0.30	0.24	0.21	0.27	0.28	0.32	0.24
	9	5	6	8	5	2	2	5	7	5	7
EPI4	0.40	0.47	0.48	0.87	0.36	0.37	0.32	0.40	0.37	0.38	0.37
	9	2	0	5	9	4	0	3	9	3	1
GH1	0.34	0.41	0.37	0.36	0.85	0.39	0.43	0.40	0.38	0.36	0.36
	6	3	1	0	8	6	4	9	6	2	9
GH2	0.28	0.35	0.31	0.32	0.79	0.27	0.36	0.30	0.34	0.35	0.35
	9	1	3	3	2	3	3	3	6	6	7
GH3	0.30	0.32	0.24	0.29	0.81	0.33	0.35	0.29	0.35	0.33	0.37
	8	9	4	9	6	9	9	9	0	3	3
GH4	0.35	0.33	0.32	0.30	0.82	0.33	0.39	0.34	0.30	0.31	0.28
	4	8	3	1	1	9	0	9	3	0	1
GO1	0.28	0.33	0.32	0.28	0.33	0.83	0.35	0.25	0.30	0.18	0.25
	0	2	0	1	5	7	0	7	1	8	7
GO2	0.28	0.30	0.28	0.22	0.29	0.83	0.34	0.22	0.29	0.21	0.24
	2	3	2	4	8	9	9	6	0	5	0
GO3	0.35	0.32	0.29	0.28	0.36	0.82	0.37	0.24	0.21	0.18	0.22
	2	5	3	1	9	6	5	3	0	6	1
GO4	0.29	0.24	0.32	0.30	0.38	0.87	0.41	0.27	0.25	0.21	0.23
	7	6	3	1	6	5	2	7	0	1	7
GP1	0.28	0.29	0.23	0.23	0.40	0.39	0.84	0.27	0.27	0.21	0.30
	0	1	0	2	3	7	1	4	0	6	5
GP2	0.30	0.28	0.32	0.21	0.35	0.31	0.84	0.30	0.29	0.25	0.29
	8	2	9	9	7	3	3	4	3	9	5
GP3	0.30	0.29	0.29	0.29	0.39	0.38	0.87	0.25	0.33	0.30	0.33
	1	3	4	0	1	1	1	1	4	6	9
GP4	0.32	0.28	0.34	0.24	0.46	0.41	0.87	0.28	0.32	0.33	0.32
	5	5	2	8	1	6	5	4	8	2	4
IIB1	0.35	0.35	0.24	0.29	0.35	0.20	0.24	0.78	0.12	0.14	0.13

	7	5	7	7	3	1	5	8	7	7	4
IIB2	0.397	0.291	0.232	0.287	0.348	0.250	0.271	0.793	0.145	0.159	0.200
IIB3	0.372	0.274	0.215	0.297	0.278	0.244	0.241	0.769	0.122	0.132	0.199
IIB4	0.413	0.317	0.237	0.312	0.339	0.264	0.288	0.827	0.188	0.144	0.183
IIB5	0.381	0.318	0.219	0.320	0.350	0.234	0.296	0.819	0.187	0.219	0.169
IIB6	0.379	0.329	0.196	0.329	0.332	0.234	0.212	0.808	0.122	0.203	-0.201
SA1	0.168	0.274	0.317	0.306	0.310	0.213	0.296	0.123	0.818	0.411	0.364
SA2	0.206	0.335	0.254	0.307	0.379	0.251	0.311	0.193	0.833	0.374	0.455
SA3	0.215	0.407	0.359	0.340	0.390	0.311	0.318	0.202	0.843	0.412	0.443
SA4	0.215	0.315	0.308	0.288	0.318	0.247	0.292	0.132	0.826	0.408	0.397
SA5	0.166	0.326	0.312	0.326	0.346	0.258	0.262	0.120	0.819	0.406	0.437
SC1	0.216	0.291	0.335	0.358	0.355	0.232	0.336	0.184	0.399	0.838	0.424
SC2	0.172	0.277	0.269	0.339	0.366	0.183	0.218	0.156	0.415	0.842	0.380
SC3	0.203	0.234	0.277	0.347	0.355	0.206	0.240	0.189	0.461	0.837	0.419
SC4	0.243	0.290	0.331	0.358	0.362	0.189	0.269	0.155	0.395	0.803	0.373
SC5	0.207	0.291	0.315	0.345	0.318	0.194	0.280	0.177	0.367	0.798	0.367
SC6	0.220	0.219	0.338	0.322	0.274	0.158	0.263	0.166	0.346	0.802	0.376
SR1	0.243	0.342	0.218	0.287	0.335	0.214	0.297	0.205	0.440	0.399	0.877
SR2	0.291	0.351	0.222	0.360	0.375	0.164	0.318	0.206	0.416	0.411	0.854
SR3	0.282	0.316	0.210	0.330	0.404	0.274	0.337	0.192	0.455	0.399	0.866
SR4	0.27	0.35	0.23	0.36	0.33	0.31	0.31	0.17	0.43	0.43	0.85

6	4	5	2	2	9	8	6	6	0	0

In this study, the results of the cross-loadings analysis showed that the loadings of the variables on their corresponding factors were generally high, typically ranging from 0.80 to 0.88. For example, the loadings of EIB (External Barriers) on its own factor ranged from 0.80 to 0.85, EPD (Passion for Developing) ranged from 0.80 to 0.86, EPF (Passion for Founding) ranged from 0.82 to 0.86, and EPI (Passion for Inventing) ranged from 0.83 to 0.88. Similarly, the loadings for GH (Harmonious Passion), GO (Optimism), GP (Perseverance), IIB (Internal Barriers), SA (Autonomy), SC (Competence), and SR (Relatedness) also ranged from 0.79 to 0.88.

These high loading values indicate that the variables have strong correlations with their respective factors, suggesting that they effectively represent their underlying constructs. Meanwhile, the loadings on other factors were generally low, typically below 0.40, indicating that these variables have weaker correlations with other factors. These results demonstrate that the measurement indicators can clearly distinguish between different latent factors, showing good structural validity, meaning that these variables accurately reflect the constructs they are intended to measure rather than other constructs.

Table 1.5 Construct reliability and validity（second−order）

Second Order Construct	First Order Construct	λ	λ^2	α	CR	AVE
EP	EPD	0.839	0.704	0.906	0.907	0.662
	EPF	0.778	0.605			
	EPI	0.822	0.676			
G	GH	0.792	0.627	0.886	0.887	0.628
	GO	0.770	0.593			
	GP	0.815	0.664			
I	EIB	0.874	0.764	0.905	0.906	0.739
	IIB	0.845	0.714			
S	SA	0.815	0.664	0.916	0.916	0.657
	SC	0.837	0.701			
	SR	0.779	0.607			

The loadings(λ) and indicator reliability(λ2) for each second-order construct within all second-order constructs are as follows:

In the EP dimension: EPD has a loading(λ) of 0.839 and an λ2 of 0.704.EPF has a loading(λ) of 0.778 and an λ2 of 0.605.EPI has a loading(λ) of 0.822 and an λ2 of 0.676.In the G dimension: GH has a loading(λ) of 0.792 and an λ2 of 0.627.GO has a

loading(λ) of 0.770 and an λ2 of 0.593.GP has a loading(λ) of 0.815 and an λ2 of 0.664.In the I dimension: EIB has a loading(λ) of 0.874 and an λ2 of 0.764.IIB has a loading(λ) of 0.845 and an λ2 of 0.714.In the S dimension: SA has a loading(λ) of 0.815 and an λ2 of 0.664.SC has a loading(λ) of 0.837 and an λ2 of 0.701.SR has a loading(λ) of 0.779 and an λ2 of 0.607.

The composite reliability (CR), Cronbach's α, and average variance extracted (AVE) values for each second-order construct are as follows: For the EP dimension, Cronbach's α is 0.906, CR is 0.907, and AVE is 0.662. For the G dimension, Cronbach's α is 0.886, CR is 0.887, and AVE is 0. 628.For the I dimension, Cronbach's α is 0.905, CR is 0.906, and AVE is 0. 739.For the S dimension, Cronbach's α is 0.916, CR is 0.916, and AVE is 0.657.

Table 1.6 Discriminant validity – HTMT（second order）

	EP	G	I	S
EP				
G	0.620			
I	0.561	0.585		
S	0.613	0.596	0.371	

Referring to the table, the HTMT values for these second-order variables are all below 0.85, indicating good discriminant validity among the latent variables and supporting the validity of the model.

Evaluation of the structural model

1） Assess the structural model for collinearity

Table 1.6 Structural model for collinearity

	VIF	Tolerance
EP -> G	1.000	1.000
EP -> S	1.654	0.604
G -> S	1.635	0.611
I -> S	1.576	0.634
I x EP -> S	1.053	0.949

In PLS structural equation modeling, multicollinearity issues need to be assessed by calculating the Variance Inflation Factor (VIF). The VIF value helps us identify high correlations among predictor variables, thereby avoiding model instability and unreliable coefficient estimates. Typically, a VIF value less than 5 is considered to indicate no serious multicollinearity problem, while a value greater than 10 suggests severe multicollinearity (Hair et al., 2011).

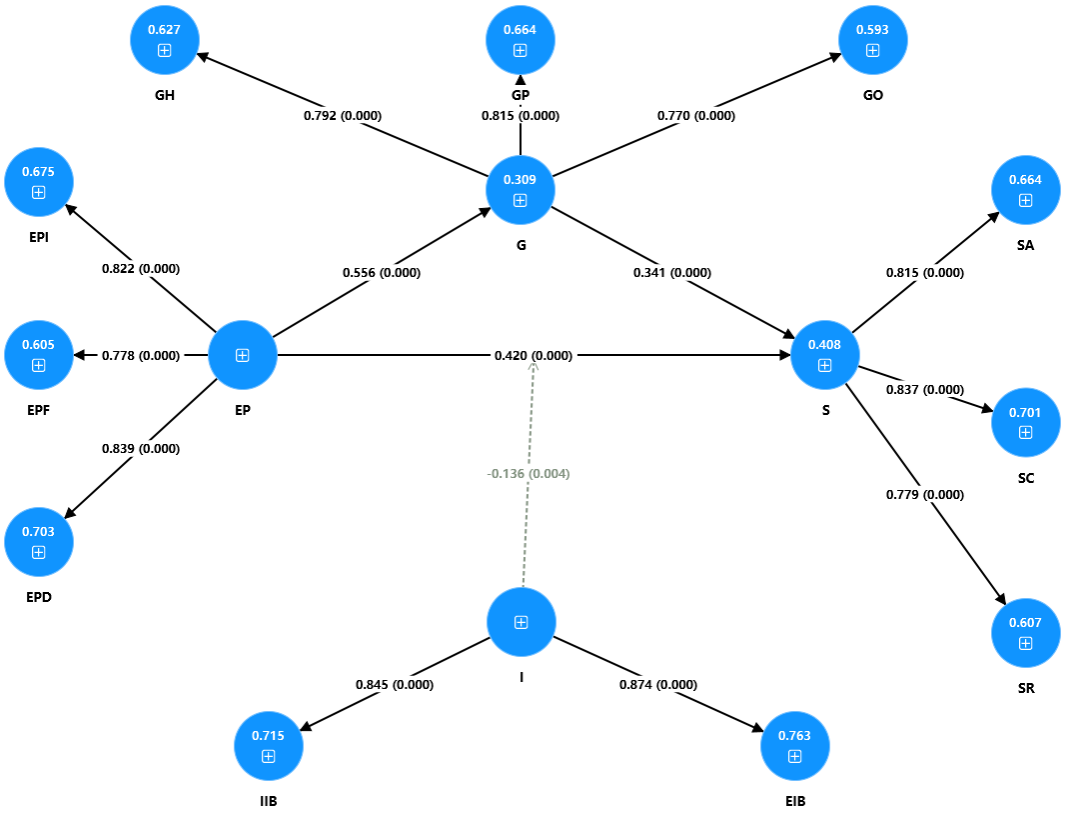

Figure4.1 Assess the significance and relevance of the structural model relationships

In the structural model of this paper, the VIF values are as follows:EP -> G: 1.000,EP -> S: 1.654,G -> S: 1.635,I -> S: 1.576,I x EP -> S: 1.053. All these VIF values are below 5, indicating that there are no serious multicollinearity issues in the model.

2）path coefficients

In PLS structural equation modeling, path coefficients are key indicators used to assess the direct impact between variables. The significance of path coefficients is typically evaluated through standard errors(σ), T-statistic(t), and p-values (Hair et al., 2011). Additionally, the confidence intervals (CI2.5% and CI97.5%) of path coefficients provide an estimate range to further validate the stability of the results (Henseler et al., 2009). Path coefficient, that is original sample (O), refers to the initial estimated values of model parameters derived directly from the observed data (Hair et al., 2010).

Table 1.7 Path coefficients

	O	σ	t	p-value	$CI_{2.5\%}$	$CI_{97.5\%}$
EP -> G	0.556	0.038	14.587	0.000	0.479	0.627
EP -> S	0.420	0.054	7.730	0.000	0.311	0.522
G -> S	0.341	0.055	6.222	0.000	0.234	0.448
I -> S	0.069	0.066	1.048	0.295	-0.061	0.195

I x EP -> S	-0.136	0.048	2.859	0.004	-0.226	-0.039

In this study: The path coefficient(O) for EP -> G is 0.556, with a standard deviation(σ) of 0.038, a T-statistic(t) of 14.587, a P-value of 0.000, and a confidence interval (CI2.5%~97.5%) of [0.479, 0.627], indicating that the effect of EP on G is significant and positive. The path coefficient(O) for EP -> S is 0.420, with a standard deviation(σ) of 0.054, a T-statistic(t) of 7.730, a P-value of 0.000, and a confidence interval (CI2.5%~97.5%) of [0.311, 0.522], indicating that the effect of EP on S is significant and positive. The path coefficient(O) for G -> S is 0.341, with a standard deviation(σ) of 0.055, a T-statistic(t) of 6.222, a P-value of 0.000, and a confidence interval (CI2.5%~97.5%) of [0.234, 0.448], indicating that the effect of G on S is significant and positive. The path coefficient(O) for I -> S is 0.069, with a standard deviation(σ) of 0.066, a T-statistic(t) of 1.048, a P-value of 0.295, and a confidence interval (CI2.5%~97.5%) of [-0.061, 0.195], indicating that the effect of I on S is not significant. The path coefficient(O) for I x EP -> S is -0.136, with a standard deviation(σ) of 0.048, a T-statistic(t) of 2.859, a P-value of 0.004, and a confidence interval (CI2.5%~97.5%) of [-0.226, -0.039], indicating that the interaction effect of I and EP on S is significant and negative.

(1) Mediating variable

In the PLS structural equation model, indirect effects are used to evaluate the impact of one variable on another through a mediator variable. The significance of indirect effects can be assessed using the original sample value (O), standard deviation (σ), T-statistic(t), p-value, and confidence intervals (CI2.5% and CI97.5%) (Hair et al., 2011). The proportion(P%) of indirect effects indicates the contribution of indirect effects to the total effects (Henseler et al., 2009).

Table 1.8 Indirect Effects

	O	σ	t	p-value	$CI_{2.5\%}$	$CI_{97.5\%}$	P%
EP -> G -> S	0.189	0.033	5.672	0.000	0.128	0.258	31.03 %
EP -> S	0.420	0.054	7.730	0.000	0.311	0.522	68.97 %
EP -> S	0.609	0.050	12.246	0.000	0.507	0.705	

In this study, the indirect effect of EP on S through G (EP -> G -> S) is 0.189, with a standard deviation(σ) of 0.033, a T-statistic(t) of 5.672, a P-value of 0.000, and a confidence interval (CI2.5% and CI97.5%) of [0.128, 0.258], accounting for 31.03% of the total effect. This indicates that the indirect effect of EP on S is significant and

positive. The direct effect of EP on S (EP -> S) is 0.420, with a standard deviation(σ) of 0.054, a T-statistic(t) of 7.730, a P-value of 0.000, and a confidence interval (CI2.5% and CI97.5%) of [0.311, 0.522], accounting for 68.97% of the total effect. This indicates that the direct effect of EP on S is significant and positive. The total effect of EP on S (EP -> S) is 0.609, with a standard deviation(σ) of 0.050, a T-statistic(t) of 12.246, a P-value of 0.000, and a confidence interval (CI2.5% and CI97.5%) of [0.507, 0.705]. These results show that while the direct effect of EP on S constitutes the major part of the impact, the indirect effect through G also makes a significant contribution, further supporting the model's validity and explanatory power.

(2) Moderating variable

This figure is a moderation effect chart, illustrating the moderating effect of I (the moderator variable) on the relationship between EP (the independent variable) and S (the dependent variable) in the PLS structural equation model. The different lines in the chart represent the effects of the moderator variable I at different levels (-1 SD, Mean, +1 SD).

Red Line (I at -1 SD): Represents the relationship between EP and S when the moderator variable I is one standard deviation below the mean. Blue Line (I at Mean): Represents the relationship between EP and S when the moderator variable I is at the mean level. Green Line (I at +1 SD): Represents the relationship between EP and S when the moderator variable I is one standard deviation above the mean.

When I is at a lower level (-1 SD) (red line), the effect of EP on S is the weakest, with S increasing at a slower rate as EP increases. When I is at the mean level (blue line), the effect of EP on S is moderate. When I is at a higher level (+1 SD) (green line), the effect of EP on S is the strongest, with S increasing at the fastest rate as EP increases. This indicates that I has a significant moderating effect on the relationship between EP and S, with higher levels of I strengthening the impact of EP on S.

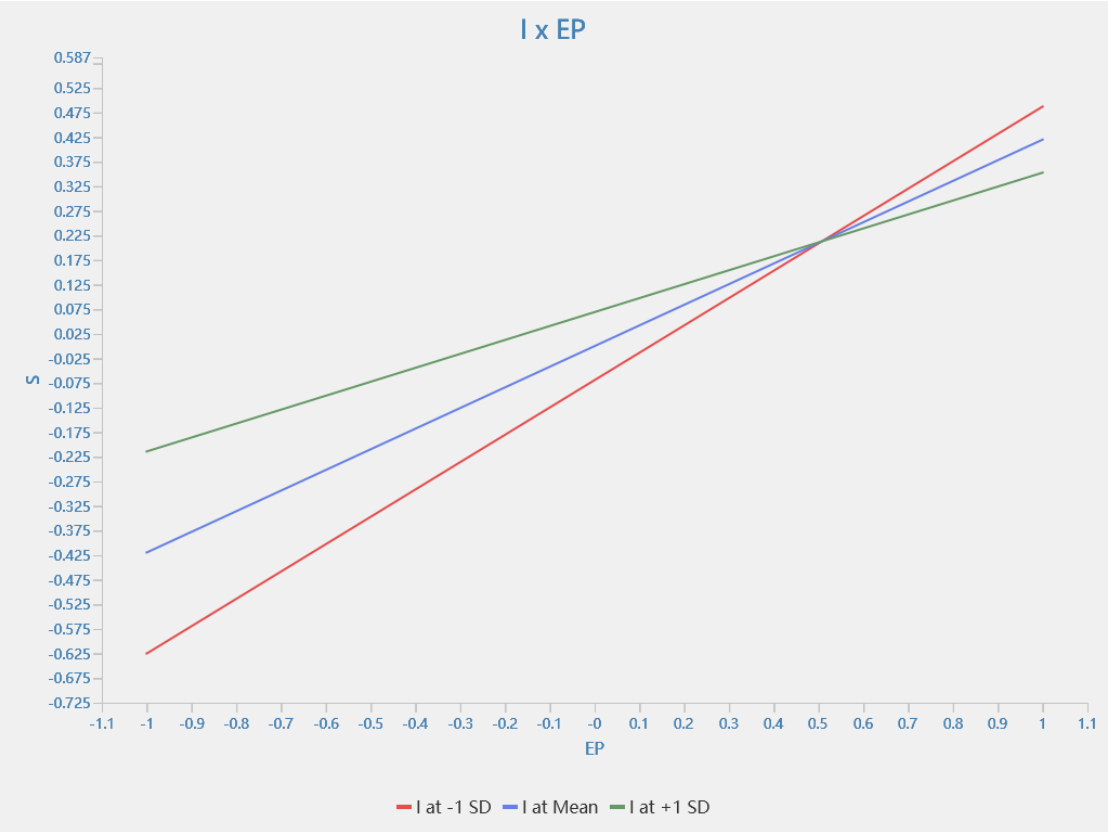

Figure 1.2 Assess the model's explanatory power

In PLS structural equation modeling, R-squared (R^2) and adjusted R-squared (Adjusted R^2) are important indicators for evaluating the explanatory power of the model. R^2 represents the proportion of variance in the target variable explained by the model, while Adjusted R^2 adjusts for the number of predictor variables to provide a more accurate assessment of explanatory power (Hair et al., 2011). Higher R^2 values indicate stronger explanatory power of the model (Chin, 1998).

In this study, the R^2 and Adjusted R^2 values are as follows: the R^2 for G is 0.309, and the Adjusted R^2 is 0.306. This indicates that the explanatory variables account for 30.9% of the variance in the G variable. The adjusted value is slightly lower but still close, indicating that the explanatory variables in the model have a certain level of explanatory power for the G variable.the R^2 for S is 0.408, and the Adjusted R^2 is 0.400. This indicates that the explanatory variables account for 40.8% of the variance in the S variable. The adjusted value is 40.0%, demonstrating that the model has a relatively strong explanatory power for the S variable.

In PLS structural equation modeling, f-squared (f^2) is used to assess the effect size of individual explanatory variables on the target variable. The f^2 value measures the change in the variance of the target variable explained by the model when a variable is

included or excluded (Cohen, 1988; Chin, 1998). The thresholds for f^2 are: 0.02 for a small effect, 0.15 for a medium effect, and 0.35 for a large effect.

Table 1.9 R−square（R2）

	R^2	ΔR^2
G	0.309	0.306
S	0.408	0.400

In PLS structural equation modeling, f-squared (f^2) is used to assess the effect size of individual explanatory variables on the target variable. The f^2 value measures the change in the variance of the target variable explained by the model when a variable is included or excluded (Cohen, 1988; Chin, 1998). The thresholds for f^2 are: 0.02 for a small effect, 0.15 for a medium effect, and 0.35 for a large effect.
In this study, the f^2 values for each path are as follows: EP -> G: f^2 is 0.447, indicating a large effect of EP on G. EP -> S: f^2 is 0.180, indicating a medium effect of EP on S. G -> S: f^2 is 0.120, indicating a small effect of G on S. I -> S: f^2 is 0.005, indicating almost no effect of I on S.I x EP -> S: f^2 is 0.030, indicating a small effect of the interaction between I and EP on S.
These results indicate that EP has the largest effect on G, with a large effect size of 0.447. EP also has a significant medium effect on S with an f^2 of 0.180. The effect of G on S is relatively small, with an f^2 of 0.120. The effect of I on S is almost negligible, with an f^2 of 0.005, and the interaction between I and EP has a small effect on S with an f^2 of 0.030.

Table 1.10 f−square（f2）

	f^2
EP -> G	0.447
EP -> S	0.180
G -> S	0.120
I -> S	0.005
I x EP -> S	0.030

（3） Asses the model's predictive power

In PLS structural equation modeling, Q-squared (Q^2) is used to assess the model's predictive power, particularly through cross-validation methods such as Stone-Geisser's Q^2, which measures the model's ability to predict new, unobserved data (Geisser, 1974;

Stone, 1974). Q^2 values are calculated by comparing the total observed variance (SSO) with the prediction error variance (SSE). A Q^2 value greater than 0 indicates that the model has predictive power, and higher Q^2 values indicate stronger predictive power. In this study, the Q^2 values for each construct are as follows: EIB: 0.515, EPD: 0.487, EPF: 0.421, EPI: 0.480, GH: 0.417GO: 0.414, GP: 0.482, IIB: 0.453, SA: 0.450, SC: 0.466, SR: 0.445.

These values indicate that the model has strong predictive power for these constructs. The Q^2 values for G (0.135) and S (0.183) indicate that the model has low to moderate predictive power for these constructs. The Q^2 values for EP and I are 0, indicating that the model has no predictive power for them.
These results suggest that the model has strong predictive power for most constructs (such as EIB, EPD, EPF, EPI, etc.), but no predictive power for EP and I. For G and S, the model's predictive power is relatively low to moderate.

Table 1.11 Q−squared（Q^2）

	SSO	SSE	Q^2 (=1-SSE/SSO)
EIB	1704	825.926	0.515
EP	3692	3692.000	0.000
EPD	1420	727.800	0.487
EPF	1136	657.423	0.421
EPI	1136	590.814	0.480
G	3408	2948.670	0.135
GH	1136	662.078	0.417
GO	1136	665.199	0.414
GP	1136	587.922	0.482
I	3408	3408.000	0.000
IIB	1704	932.141	0.453
S	4260	3482.057	0.183
SA	1420	780.605	0.450
SC	1704	909.972	0.466
SR	1136	630.124	0.445

（4）Hypothesis testing
Based on the above research, the following hypotheses were obtained: Grit positively mediates the relationship between Entrepreneurial mindset and self-employed performance: This hypothesis was tested and found to be significant with a T statistic of 5.672 and a P value of 0.000, leading to its acceptance.

Table 1.12 hypothesis test

Hypo	Statement	Stat. Value	Accepted/Rejected
1	Grit positively mediates the relationship between Entrepreneurial mindset and self-employed performance	t = 5.672, P = 0.000	Accepted
2	Innovative barriers moderate the relationship between Entrepreneurial mindset and self-employed performance	t = 2.859, P = 0.004	Accepted
3	Entrepreneurial mindset directly impacts self-employed performance	t = 7.730, P = 0.000	Accepted

Innovative barriers moderate the relationship between Entrepreneurial mindset and self-employed performance: This hypothesis was also supported, with a T statistic of 2.859 and a P value of 0.004, indicating its acceptance.
Entrepreneurial mindset directly impacts self-employed performance: The direct effect of Entrepreneurial mindset on self-employed performance was confirmed with a T statistic of 7.730 and a P value of 0.000, resulting in its acceptance. In summary, all three hypotheses were supported by the data, demonstrating significant relationships and effects in the proposed model.

Discussion

Grit positively mediates the relationship between Entrepreneurial mindset and self-employed performance.

People with grit can persevere and appreciate difficult tasks despite failures. The definition incorporates courage and character. Love, perseverance, and conquering challenges. Grit is the excitement and determination to achieve long-term goals. It is a goal-driven, persistent personality (Duckworth et al., 2007; Przystas (2016; Baruch-Feldman, 2017). Duckworth et al. (2007) describe grit as having perseverance and passion.

Perseverance requires resilience and determination in the face of defeat. Recent research on grit indicates that perseverance is essential for continual progress. To master, it is critical to practice difficult skills after discovering a preference. Perseverance entails sticking to it (https://lauruscollege.edu/; www.viacharacter.org). As one informant indicated that: “. I personally believe that perseverance is the

persistence of entrepreneurs towards their entrepreneurial goals, including persistent efforts towards their goals and consistency of interests.

Perseverance is a goal-oriented purposefulness that requires long-term commitment and discipline. It is linked to an individual's ability to control, self-regulate, and postpone satisfaction (Schaffner, 2020). Duckworth's research found that success in any endeavor necessitates perseverance in the face of adversity (Duckworth, Kirby, Tsykayama, Berstein, & Ericsson, 2010). This section of the literature review is backed by informant interviews.

An entrepreneurial mindset is a set of characteristics and skills that enable people to recognize and capitalize on opportunities, as well as overcome and learn from challenges, successes, and failures in both business and non-business contexts (McGrath & MacMillan, 2000; Sarasvathy, 2001; Baron, 2020; Daspit et al., 2021).

Self-employed performance comprises three dimensions: autonomy, competence, and relatedness (Deci & Ryan, 2008). Autonomy improves creativity and performance by reducing stress, anxiety, and distraction, as well as increasing competence and self-efficacy (Hackman & Oldham, 1976; Zhou 1998; Baer and Oldham 2006).

Entrepreneurial competency refers to the abilities and behaviors required to start, grow, and manage a firm. It also entails managing the hazards of running a firm. To succeed, business owners and startup founders must have the highest level of entrepreneurial skills. Competencies for self-employed workers include skill variety, social support, performance feedback, and justice perspective (Sjanne et al., 2022; Gagné et al.,2022).

Grit drives action and cognition, resulting in creative force. Individuals with grit can solve issues through constant learning. Entrepreneurs who exhibit grit perform better at work. Overcoming professional uncertainty is crucial. Similarly, developing a mindset of entrepreneurship is crucial for aspiring entrepreneurs. Consequently, grit has a mediating role in the relationship between entrepreneurial mindset and self-employed performance.

Innovation barriers regulate the relationship between entrepreneurial mindset and self-employed performance

Hu and Luo (2020) define employee innovation behavior as how employees implement innovative ideas or problem solutions created in real-world work scenarios to specific practices. However, the establishment of innovation hurdles will impede innovative behavior. Innovation is not a straightforward and sequential process, but rather an intricate and ever-changing process that encompasses numerous problems and

barriers. These obstacles and impediments, sometimes known as innovation barriers restrict or hamper the emergence or spread of innovation. Innovation barriers have both internal and external implications. The first type of internal barrier is a personal perspective, which focuses on the psychological and cognitive factors that influence individual innovation. According to creative cognitive theory, creativity consists of two primary cognitive processes: generative and exploratory. The generative phase develops new and diverse ideas, while the exploratory process assesses and refines them. According to Finke et al. (1992), innovation obstacles hinder or interfere with certain cognitive processes, including mental fixation, functional fixation, confirmation bias, and assessment apprehension.

Individual entrepreneurs face higher barriers. Marketing innovative technological products and services as a freelancer is challenging. Large multinational corporations must overcome these limitations. Innovation barriers have a deleterious impact on entrepreneurs' cognition and attention, particularly young people's creative problem-solving. The influence reduces both the number and quality of thoughts. People's tolerance for ambiguity, self-efficacy, and level of innovative activity all show a substantial

For an external barrier, Baldwin and Lin (2002) discovered that expenses hinder new and competitive enterprises, which has an external impact on innovation. Institutional impediments are prevalent in innovation and new firms. Foss et al. (2020) examine institutional hurdles to innovation in China, which include inadequate intellectual property protection, state involvement and market distortions, low-quality education and research infrastructures, and cultural attitudes that inhibit risk-taking and creativity. Miller et al. (2020) investigated the hurdles to open innovation and entrepreneurial success, which include a need for more trust, resources, skills, and culture. Amodio, Medina, and Morlacco (2023) examine innovation hurdles to self-employment in Peru. They discovered that labor market factors, wage fluctuations, and wage-based regulations harmed the self-employed.

Entrepreneurial mindset has a positive effect on self-employed performance.

The entrepreneurial mindset, which encompasses innovation, resilience, and a propensity to take deliberate risks, has been the subject of academic discourse, particularly as a precursor to entrepreneurial success (Zhou et al., 2020). Individuals who possess an entrepreneurial mindset are more rational and impassioned in their approach to identifying opportunities, generating value, and ultimately improving their individual performance.

Entrepreneurial mindset is the optimal balance between passion, rationality, and selfcontrol.

It emphasizes the psychological characteristics of entrepreneurs, including self-control, rationality, and passion. Daspit et al., 2021; Baron, 2020).

Given the crucial role that entrepreneurial mindset plays in driving innovation, opportunity identification, and value creation, it has always been a topic of interest for scholars and practitioners. Sarasvathy (2001) points out that entrepreneurial mindset is "a logic of control, not a logic of prediction." Entrepreneurship involves experimentation and adaptation, unlike planning and prediction. This also means that the entrepreneurial mindset is flexible and pragmatic, allowing entrepreneurs to collaborate with stakeholders to create opportunities.

The passion for entrepreneurship and the drive for growth have a significant impact on performance outcomes, including increased autonomy and enhanced capabilities. Entrepreneurial passion is defined as a positive emotional state that arises from activities that are consistent with an individual's identity and are meaningful to them (Cardon et al., 2020). This emotional state serves as a catalyst for entrepreneurial activity, motivating individuals to initiate and pursue entrepreneurial opportunities, overcome challenges, and achieve their goals (Murnieks et al., 2014). With the promotion of psychological capital and policy support, entrepreneurial passion has been shown to enhance entrepreneurial persistence and overall business performance (Chen et al., 2022). Entrepreneurial passion is considered critical in social entrepreneurship, where the passion of the founder can significantly impact the social objectives of the business (Junior, 2021).

Developmental enthusiasm is also considered a key driver of entrepreneurship, as it motivates individuals to improve and maintain the quality and performance of their businesses, adapt to changing environments, and achieve their long-term goals (Murnieks et al., 2014). The higher the centrality of identity in a business, the stronger the impact of entrepreneurial passion on resilience (Zhang et al. 2021). Entrepreneurial passion can be enhanced by increasing psychological capital and obtaining policy support, thereby improving entrepreneurial persistence and business performance (Chen et al. 2022). Having an entrepreneurial mindset can inspire entrepreneurs to develop their own capabilities and achieve greater autonomy, as it fosters positive sentiments such as development enthusiasm and entrepreneurial passion. The performance of self-employment is positively influenced by an entrepreneurial perspective, as these factors result in improved entrepreneurial performance.

Recommendations

The findings allow the researcher to provide recommendations in three areas: innovative management, academics, and further study as follows:

1. Innovative Management

For the innovative managerial side: It has been divided into two areas: increasing the level of self-performance and managing the activities of business owners.

1.1 Boosting Performance: The self-employ performance questionnaire found that knowledge integration, inventiveness, good communication skills, and various behaviors improve performance. Consequently, self-employed individuals can improve their abilities in the following ways:

1.2 Maintain one's well-being. Mental competency is essential in deciding if someone can be an independent entrepreneur. This includes the ability to choose to be self-employed while retaining psychological stability. So, look into time management practices and technologies that might help one optimize time while minimizing distractions.

2. Academic

For academics. Short-term training should be provided to solve innovative hurdles. 2.1 Innovative Barriers management: Innovative barriers impede bringing fresh ideas to fruition. Consequently, students must have the opportunity to find a solution to barriers, including a need for more financing, restricted resources, or complicated laws. Proactively identify potential impediments and devise solutions to overcome them. At the same time, the interaction effect emphasizes the significance of being flexible. Entrepreneurs must be able to adapt their strategy based on the individual obstacles they face.

REFERENCES

Allen, E., & Smith, R. (2023). The gig economy and self-employment performance: A systematic review. *Journal of Business Venturing*, 38(1), 1-25.

Baluku, M. M., Kikooma, J. F., & Kibanja, G. M. (2021). Self-employment in Africa: Opportunities and challenges. In A. Özbilgin & G. Healy (Eds.), *The Routledge companion to career studies* (pp. 345-362). Routledge.

Belay Danie, A. (2023). Institutional trust and self-employment: Evidence from Ethiopia. *International Journal of Entrepreneurial Behavior & Research.*

Chen, G., Bliese, P. D., & Mathieu, J. E. (2022). A framework for conducting multilevel construct validation. In F. Dansereau & F. J. Yammarino (Eds.), *Research in multi-level issues: Multi-level issues in organizational behavior and processes* (Vol. 1, pp. 273–303). Elsevier Science/JAI Press.

Chen, Y., Liu, Y., & Zhang, J. (2020). Effects of competence feedback on creativity: The mediating roles of intrinsic motivation and self-efficacy and the moderating role of creative self-efficacy. *Creativity Research Journal*, 32(1), 1-10

Ferreira-Neto et al. (2023). Self-determination theory applied to entrepreneurship: A systematic review. Journal of Business Venturing.

Guo et al. (2020). Performance evaluation of self-employed individuals in the construction industry using a hybrid MCDM model based on fuzzy DEMATEL, fuzzy ANP and fuzzy TOPSIS. *International Journal of Construction Management.*

He et al. (2021). The impact of digital tools on self-employed performance: Evidence from China. Journal of Business Research.

Kim & Patel. (2022). Self-efficacy and resilience as predictors of success in self-employment. *Journal of Business Venturing Insights*.

Lee et al. (2021). Self-Employment Motivation: A Systematic Review. Journal of Small Business Management.

Li, K. (2022). State Council decision on improving the business environment for self-employed workers and protecting their legitimate rights and interests.*Retrieved.https://www.chinadaily.com.cn/a/202210/26/WS6177a0c9a310e0e0e3a6821f4f.html*

Liu, Y., Zhang, Y., & Zhang, J. (2021). Entrepreneurial intention, self-efficacy and performance of self-employed vocational university graduates in China. *Journal of Vocational Education & Training,* 73(1), 1-18.

Ma, Y., & Liu, J. (2020). Self-employment after vocational education: A study of Chinese graduates. *International Journal of Educational Development,* 77, 102227.

Martin & Lewis. (2021). Education as a determinant of self-employed performance. *Education Economics*.

Monika et al. (2022). Autonomy is a key factor that influences emotional well-being.

Journal of Happiness Studies.
People's Daily Online. (2023). Digital economy creates new opportunities for self-employed workers in China: survey. *Retrieved from http://en.people.cn/n3/2023/1026/c90000-9874748.html*
Rakesh et al. (2021). Individual factors affecting performance in self-employed ventures. *International Journal of Entrepreneurial Behavior & Research.*
Ren X. (2020). Vocational education creates low-entry high-profit self-employment. China Daily.
Robinson et al. (2022). Hidden factors influencing performance in self-employed ventures. *Journal of Business Venturing*.
Smith et al. (2021). Barriers to innovation for self-employed workers. International Journal of Innovation Management.
Smith & Johnson. (2021). Innovation capabilities and growth aspirations. *Journal of Business Research*.
Toth et al. (2021). Self-Employment Performance: A Systematic Review. *Journal of Small Business Management*.
Williams et al. (2023). The evolving KPIs in the context of digital platforms and the gig economy. *Journal of Management*.
Wu et al. (2022). Entrepreneurship education can increase entrepreneurial intentions of college students through enhancing their entrepreneurial self-efficacy (ESE) and entrepreneurial passion (EP). *Journal of Business Venturin*
Wu et al. (2023). Gamifying innovation activities to enhance relatedness improves idea generation through psychological safety and engagement. *Creativity and Innovation Management*.
Xifeng Lu et al. (2022). The impact of mental health and well-being on performance is an under-researched area. *Journal of Occupational Health Psychology.*
Zhang et al. (2021). Entrepreneurial passion can increase entrepreneurial performance through enhancing entrepreneurial resilience. *Journal of Business Venturing.*
Ferreira-Neto MN, de Carvalho Castro JL, de Sousa-Filho JM and de Souza Lessa B (2023) The role of self-efficacy, entrepreneurial passion, and creativity in developing entrepreneurial intentions. *Front. Psychol*. 14:1134618. doi: 10.3389/fpsyg.2023.1134618
Moore, M. (2022) Learned Optimism *https://positivepsychology.com/*
Hamzeh A. A., Mahmoud, A. & Rababah, A. (2022)Optimism Predictive Ability and Psychological Flexibility among Students during COVID-19 Pandemic Journal of Educational and Social *Research www.richtmann.org*
Dohmen, T., Quercia, S. & Willrodt, J. (2023) On the psychology of the relation between optimism and risk taking. J Risk Uncertain (2023). *https://doi.org/10.1007/s11166-023-09409-z*
Carver CS, Scheier MF, Segerstrom SC. Optimism. Clin Psychol Rev.

2010;30(7):879-889. doi:10.1016/j.cpr.2010.01.006 Scotch, E. (2022) What Is Optimism? *https://www.verywellmind.com/the-benefits-of-optimism-3144811*
DiNapoli, J. (2023) Distinguishing between Grit, Persistence, and Perseverance for Learning Mathematics with Understanding Educ. Sci. 2023, 13(4), 402; *https://doi.org/10.3390/educsci13040402*
Schaffner, A.K. (2020) Perseverance in Psychology: Meaning, Importance & Book.*https://positivepsychology.com/perseverance/#perseverance*
Amodio, F., Medina, M. & Morlacco, M. (2023) Labor Market Power, Self-Employment, and Development.*https://steg.cepr.org/*
Melak, D. & Derso , B. (2023) Training of youths for effective self-employment practices *https://www.emerald.com/*
Adi Bhat（2024）What is Survey Dropout Analysis and why is it needed? https://www.questionpro.com/blog/what-is-survey-dropout-analysis/
Wang, Y., Li, Y., & Zhang, Y. (2021). The influence of the Belt and Road Initiative on the internationalization of higher education in Yunnan Province. *Journal of Higher Education*, 42(1), 1-10.