



The Role of Entrepreneurship Education in Promoting Innovation and Economic Growth

Wei Wang and Vissarout Krabuansob

PhD Candidate, Faculty of Management, Shinawatra University

Email: 61246149@qq.com; vissarout.k@siu.ac.th

Received January 12, 2025 Revise August 30, 2025 Accepted August 31, 2025

Abstract

This Research article had Background While different regions may adopt unique approaches based on their specific needs and contexts, there is a common focus on experiential learning, interdisciplinary approaches, and the development of entrepreneurial mindsets. As entrepreneurship education continues to evolve across the globe, it will play a crucial role in fostering the next generation of entrepreneurs and innovators, who will shape the future of the global economy. Methodology The author adopted a mixed-methods research paradigm, combining both quantitative and qualitative approaches. Due to time and geographical constraints, the survey respondents are set as undergraduate students in some colleges and universities. Random sampling method was used to conduct the questionnaire survey. In October-December 2023, the questionnaires were mainly distributed by online questionnaires. 314 valid questionnaires were recovered. Research Results The correlation between Entrepreneurship Education and Innovation is high at 0.850**, indicating a strong positive correlation between Entrepreneurship Education and Innovation. The correlation between Innovation and Economic Growth is also high at 0.937**, indicating a strong positive correlation between innovation and economic growth. The correlation between Entrepreneurship Education and Economic Growth is 0.796**, which also shows a degree of positive correlation between the two. Conclusions By both quantitative and qualitative analyzing, the following three conclusions were drawn. There is a positive effect of entrepreneurship education on students' innovativeness. There is a positive impact of students' innovation ability on economic growth. Entrepreneurship education indirectly affects economic growth by enhancing students' innovative capabilities.

Keywords: Entrepreneurship Education, Innovation, Economic Growth, Role of Promoting

Introduction

The historical development of entrepreneurship education can be traced back to the early 20th century. During this period, there has also been a growing focus on the role of entrepreneurship education in fostering social and environmental sustainability, with the introduction of concepts such as social entrepreneurship, sustainable entrepreneurship, and circular economy. This reflects the increasing recognition that entrepreneurship has the



potential to address some of the world's most pressing challenges, from poverty alleviation to climate change mitigation()

Entrepreneurship education can play a vital role in fostering a culture of innovation by developing innovative mindsets, encouraging cross-disciplinary collaboration, promoting problem-based and experiential learning, cultivating an entrepreneurial ecosystem, emphasizing social innovation, and influencing policy and institutional support^[3]. The global perspectives on entrepreneurship education highlight the growing recognition of its importance in driving economic growth, innovation, and social impact.

Research Objectives

The primary objective of this research is to explore the role of entrepreneurship education in promoting innovation and economic growth. The specific research objectives include:

To analyze the path and mechanism of entrepreneurship education's impact on innovation capacity.

To explore the direct and indirect effects of innovation capacity on economic growth.

To assess the effectiveness and significance of entrepreneurship education in promoting economic growth.

To propose relevant policy recommendations for entrepreneurship education and innovation capacity development.

Literature Review and concepts

Entrepreneurship refers to the process of identifying, creating, and pursuing opportunities to develop innovative ideas, products, services, or businesses (Andreas, 2013).

Economic growth refers to the sustained increase in the production and consumption of goods and services within an economy over a specific period.

The human capital theory, proposed by Gary Becker and Theodore Schultz, posits that investments in education, training, and skill development lead to improved productivity, income, and economic growth. This theory provides a useful framework for understanding the relationship between entrepreneurship education and innovation, as it highlights the importance of developing human capital to foster innovation and drive economic development.

The knowledge spillover theory of entrepreneurship, proposed by Zoltan Acs and David Audretsch, posits that entrepreneurship is a key channel for the transmission of knowledge spillovers, which lead to innovation and economic growth. According to this theory, knowledge created within organizations or research institutions often "spills over" into the wider economy, providing opportunities for entrepreneurs to exploit this knowledge and create new ventures based on innovative ideas.

Entrepreneurship is a core driver of economic growth in a country or region (Praag & Versloot, 2007), and entrepreneurship can contribute to economic development, industrial growth, and structural transformation and growth of the economy, as well as create employment and promote social and technological progress (Hathaway & Litan, 2014). Entrepreneurship is a catalyst for a country's economic growth (Abidin & Baker, 2004), and



entrepreneurship is a decisive factor in realizing the dynamism of today's economy and regional competitiveness (Zaryab & Saeed, 2018).

Minniti (2001) argues that entrepreneurship education is not only for individuals without entrepreneurial experience, but also for entrepreneurs who are in the process of starting a business as well as those who have previous entrepreneurial experience. Entrepreneurship is of considerable importance for economic growth and technological progress (Birch, 1979; Reynolds et al., 1994; Sheshinski et al., 2007). Entrepreneurship education is often recognized as an effective strategy for achieving innovative talent development (Lin, 2004), aiming at achieving more innovation. Universities in many countries have undertaken extensive entrepreneurship education efforts (Fayolle, 2000; Lin, 2004).

In conclusion, Entrepreneurship education actively promotes innovation and economic growth by nurturing entrepreneurial mindsets, fostering the development of entrepreneurial skills, and creating an enabling environment for entrepreneurial endeavors.

Research Methodology

This study focuses on empirically analyzing the impact of entrepreneurship education on innovation as well as economic growth through survey research. Innovation can be directly influenced through Cultivation of creative ability and System for encouraging innovative and creative behaviour. Innovation directly affects Economic Growth through Technological innovation of enterprises and Adjustment and growth of industrial structure.

Table 1 Indicators of variables

Entrepreneurship Education	E1: Educational Objective Orientation
	E2: Entrepreneurship education system: curriculum, teaching content, teaching methods, assessment orientation
	E3: Cultivation of creative ability
	E4: System for encouraging innovative and creative behaviour
Innovation	I1: Creativity
	I2: Creative application ability
	I3: Product development ability
Economic Growth	EG1: Creative capacity of labour factors
	EG2: Technological innovation of enterprises
	EG3: Adjustment and growth of industrial structure

The following hypotheses are developed:

H1: There is a positive effect of entrepreneurship education on students' innovativeness. Among students who receive entrepreneurship education, their level of innovativeness will be significantly higher than those who do not receive entrepreneurship education.

· H2: There is a positive impact of students' innovation ability on economic growth. Students with strong innovation skills are more likely to create new value and employment opportunities in their future careers, thus contributing to economic growth.



- H3: Entrepreneurship education indirectly affects economic growth by enhancing students' innovative capabilities. Entrepreneurship education positively affects economic growth by developing students' innovative thinking and practical skills.

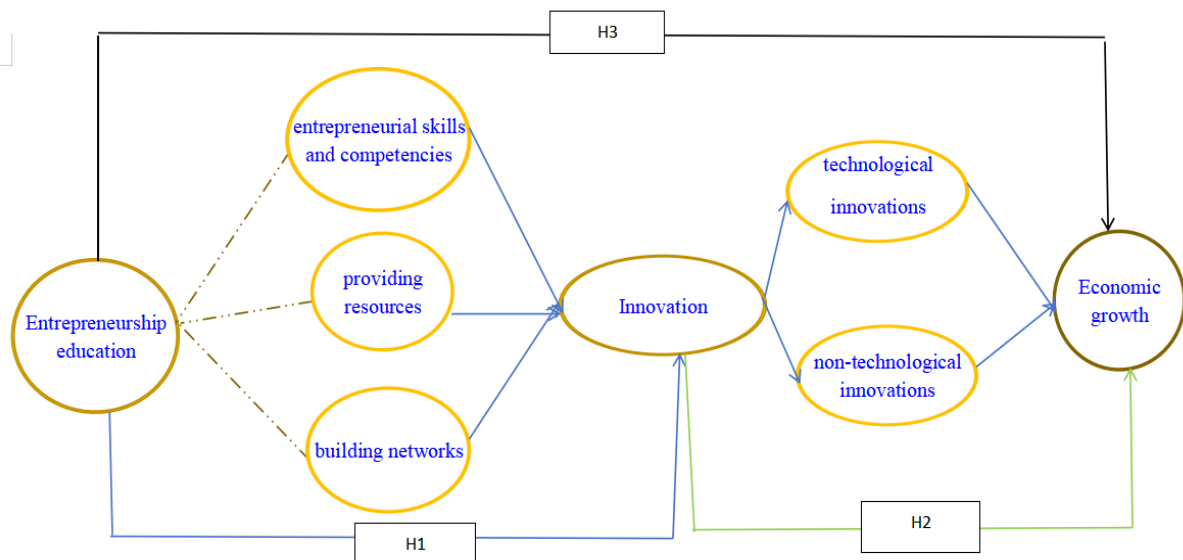


Figure 1 Conceptual Framework

And path analyses were performed using AMOS 17 software to validate the hypothesized results.

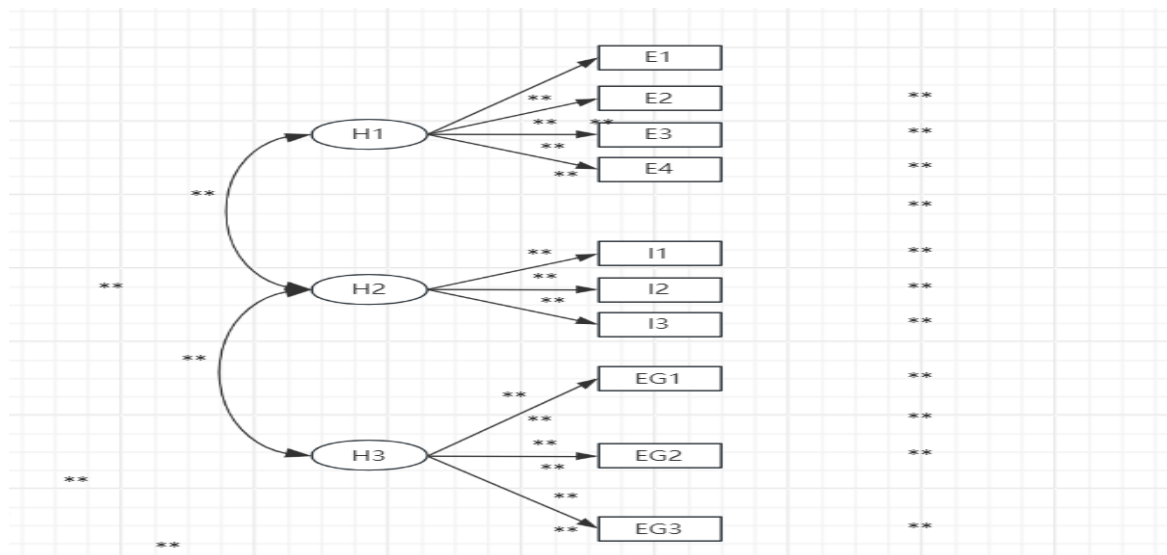


Figure 2 Path analyses by AMOS

Population and Sample Size



This study focuses on empirically analyzing the impact of entrepreneurship education on innovation as well as economic growth through survey research. In terms of data collection, online questionnaires were mainly used^[4]. The study plans to conduct the survey in October-December 2023.

By analyzing and studying these 314 questionnaires, the researcher can gain insights into the perceptions and attitudes of current undergraduate students towards entrepreneurship education, as well as their views on the relationship between innovation and economic growth.

Research Results

Analysis of reliability\

This again demonstrates a very high level of internal consistency reliability.

Table 2 Overall Reliability Statistics of the Questionnaire

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.798	.795	21

Analysis of Validity

Table 3 Overall KMO and Bartlett's Test of the questionnaire

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin value		0.861
Approximate chi-square		1470.290
Bartlett's test for sphericity	df	378
Probability of significance		0.000

According to the formula for calculating the degrees of freedom in a confirmatory factor analysis (CFA) model, the degrees of freedom (df) is calculated as:

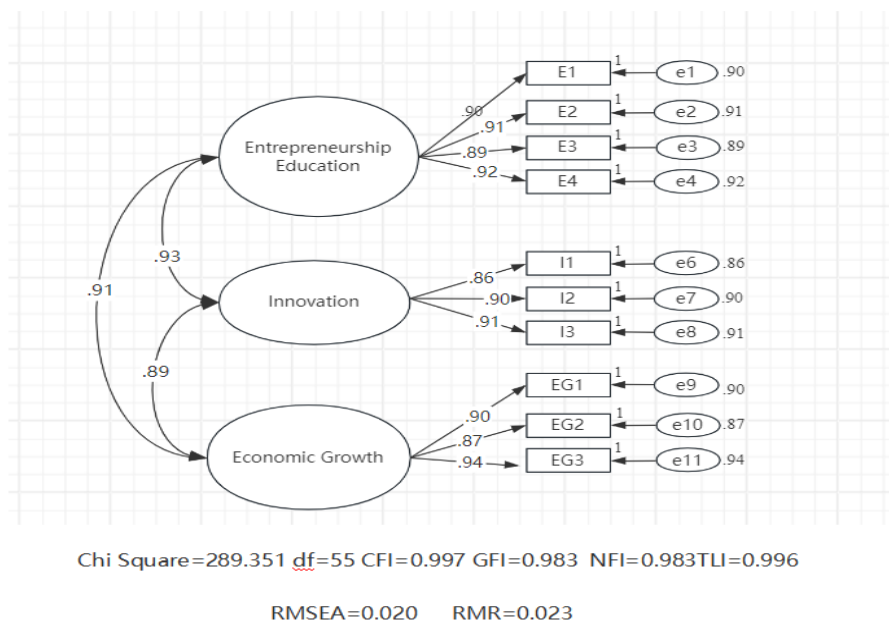




Figure 3 CFA model outputs for the variables

Descriptive statistics.

After the questionnaires were returned, the basic information of the 314 valid samples was summarized using SPSS 22.0 in order to obtain an overall picture of the questionnaire. The summarized results include the frequency and percentage of each of the three demographic variables: age, gender, and education level. The details are shown in the table below.

Table 3 Sample Characteristics Distribution

Variables	Categories	Frequency	Percentage(%)	Mean	Std. Deviation
Age	18-24	136	43.3	4.518	1.038
	25-34	102	32.5		
	35-44	53	16.9		
	45-54	23	7.3		
	55-64	0	0		
	65	0	0		
Gender	Male	111	35.4	1.563	0.796
	Female	203	64.6		
Education level	High school diploma	0	0	2.558	0.873
	Associate's degree	69	22.0		
	Bachelor's degree	107	34.1		
	Master's degree	94	29.9		
	Doctoral degree	32	10.2		
	Other (please specify)	12	3.8		

Based on the analysis of the survey data, we can conclude that the survey sample is mainly concentrated in the age group of 18-34 years old, especially the age group of 18-24 years old accounts for a larger proportion. In addition, the survey sample is predominantly female, accounting for 64.6%. The distribution of education levels is relatively balanced, with the highest number of undergraduate degrees (34.1%), followed by master's degrees (29.9%), high school diplomas (22.0%), doctoral degrees (10.2%), and other types of education (3.8%).

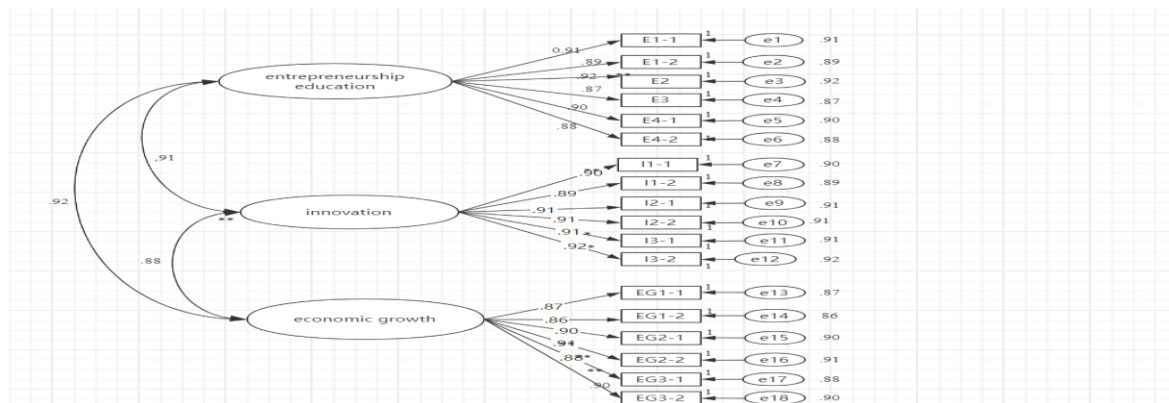


Figure 4 Results of AMOS path analysis of each variable

Correlation Analysis. In statistical analysis, correlation analysis is used to determine whether there is a correlation between variables^[5]. SPSS 22 software was used to determine the strength and direction of the correlation between the variables. The standard of measurement is the correlation coefficient, and this study adopts Pearson correlation coefficient, the coefficient is between -1.0 and +1.0, the closer to -1.0 means the stronger negative correlation between the variables, and the closer to +1.0 means the stronger positive correlation between the variables. The correlation between entrepreneurship education, innovation and economic growth was analysed and the results are shown in the table below^[6].

Table 4 Analysis of entrepreneurship education, innovation, economic growth and the correlation between the dimensions

	Entrepreneurship Education	E1	E1	E1	E1	Innovation	I1	I2	I3	Economic Growth	EG1	EG2	EG3
Entrepreneurship Education	1												
E1	0.937**	1											
E2	0.969**	0.820**	1										
E3	0.904**	0.850**	0.873**	1									
E4	0.845**	0.792**	0.818**	0.937**	1								
Innovation	0.850**	0.803**	0.818**	0.939**	0.813**	1							
I1	0.822**	0.772**	0.796**	0.909**	0.780**	0.787**	1						
I2	0.870**	0.840**	0.825**	0.863**	0.793**	0.826**	0.783**	1					
I3	0.793**	0.796**	0.904**	0.772**	0.796**	0.909**	0.780**	0.787**	1				
Economic Growth	0.796**	0.863**	0.937**	0.909**	0.772**	0.796**	0.909**	0.780**	0.787**	1			
EG1	0.909**	0.793**	0.820**	0.904**	0.840**	0.772**	0.796**	0.909**	0.780**	0.787**	1		
EG2	0.863**	0.909**	0.796**	0.820**	0.904**	0.937**	0.772**	0.796**	0.909**	0.780**	0.787**	1	
EG3	0.818**	0.796**	0.937**	0.863**	0.793**	0.909**	0.850**	0.772**	0.796**	0.909**	0.780**	0.787**	1

** p<0.01 , * p<0.05



Research Discussion

Hypothesis H1: Entrepreneurship education has a positive impact on students' innovation.

From the picture content, entrepreneurship education is represented by multiple specific indicators (E1 - 1, E1 - 2, E2, E3, E4 - 1, E4 - 2), and innovation is represented by multiple indicators (I1 - 1 (e7), I1 - 2 (e8), I2 - 1 (e9), I2 - 2, I3 - 1 (e11), I3 - 2 (e12), etc.). If we can observe a relatively high correlation coefficient between the relevant indicators of entrepreneurship education and innovation indicators, and show a positive correlation trend to a certain extent, then we can initially support hypothesis H1. For example, observing a relatively significant and positive correlation coefficient between "entrepreneurship education" and "innovation", such as 0.9k, 0.92, 0.90, etc., which indicates that there may be a positive impact between entrepreneurship education and innovation, thus providing certain support for hypothesis H1.

Hypothesis H2: Students' innovation ability has a positive impact on economic growth.

There is also a certain correlation between innovation indicators and economic growth indicators (EG1 - 1, EG1 - 2, EG2 - 1, EG2 - 2, EG3 - 1, EG3 - 2). If the correlation coefficient between innovation indicators and economic growth indicators is relatively high and positive, then hypothesis H2 can be supported. From the picture, we can see the correlation coefficients between innovation and economic growth such as 0.90, 0.91, 0.87, 0.88, 0.91, etc. These correlation coefficients indicate that there may be a positive relationship between innovation and economic growth, providing a certain degree of support for hypothesis H2.

Hypothesis H3: Entrepreneurship education indirectly affects economic growth by enhancing students' innovation ability.

To verify this hypothesis, we need to combine the verification results of hypotheses H1 and H2. If entrepreneurship education has a positive impact on innovation (hypothesis H1 is established), and innovation has a positive impact on economic growth (hypothesis H2 is established), and at the same time, it is observed that in the case of considering innovation ability, the direct impact of entrepreneurship education on economic growth is relatively weakened, then hypothesis H3 can be supported. From the picture content, we can observe that there are certain correlation coefficients between entrepreneurship education, innovation and economic growth, and a possible influence path is presented. For example, there is a relatively high positive correlation coefficient between entrepreneurship education and innovation, and there is also a certain positive correlation coefficient between innovation and economic growth. At the same time, if we further analyze, we can find that when considering innovation factors, the direct influence path coefficient of entrepreneurship education on economic growth may be smaller than that when innovation factors are not considered, thus supporting hypothesis H3.

Conclusion

In the context of informatization and knowledge economy, entrepreneurship education is an important part of the deepening reform and development of higher education^[7].



Entrepreneurship education is an important support for promoting economic growth in the following ways:

Entrepreneurship education promotes economic growth by accumulating human capital. As early as in the 1960s, economists such as Schultz, Becker and Danielson conducted in-depth research on the impact of human capital on the economy, and their core theory is that the accumulation of human capital plays a crucial role in the sustainable accumulation of the economy and provides inherent support for the economic development. As one of the main places for human capital accumulation, entrepreneurship education in colleges and universities has become a way of human capital accumulation by improving the quality of labor force.

On the one hand, entrepreneurship education in colleges and universities can cultivate the thinking ability and enhance the entrepreneurial skills of the trainees, thus improving the human resource structure of the society and providing high-quality human resources for the development of the region. On the other hand, entrepreneurship education can also improve the level of innovation and entrepreneurship knowledge and ideological quality of workers. The labor force with high innovation and entrepreneurship knowledge and good ideological quality is conducive to promoting the transformation of economic development mode, which is embodied in the transformation of the economy from the low-grade growth mode (high consumption and low output) to the high-grade growth mode (low consumption and high output), and thus promotes the growth of industries

Entrepreneurship education promotes economic growth through technological progress. The New Growth Theory put forward by American economists Romer and Lucas reveals the path of economic growth, which is mainly manifested as: education-human capital-technological progress-economic growth. This path emphasizes that education is the main source of human capital formation, and human capital is the core force driving technological progress, which ultimately leads to economic growth and economic growth,

And Eicher also put forward a viewpoint in this regard, arguing that the supply of human capital not only influences the invention and creation of new technologies, but also acts as the bearer and distributor of new technologies, and ultimately realizes technological innovation. As a platform for new technologies, university entrepreneurship education institutions have advantages in terms of innovation knowledge, which can enhance the level of autonomous innovation of the government, strengthen the innovation capacity of enterprises and produce cooperative innovation

Entrepreneurship education in colleges and universities promotes economic growth through promoting regional independent innovation. Science and technology innovation is the core and foundation of independent innovation, the driving force of economic development, and plays a key role in economic development and growth. According to traditional innovation theory, S&T innovation activities are mainly led by enterprises and governments, and colleges and universities only play the role of knowledge transmission and education. Under the background of knowledge economy, the economic growth mode gradually relies on knowledge innovation. Therefore, in order to better promote the regional economy and economic development, it is necessary for universities, enterprises and governments to realize dynamic network cooperation and integration of industry, academia and research.



Various practical platforms for entrepreneurship education in colleges and universities, such as entrepreneurship incubation bases for college students, innovation and entrepreneurship training centers for college students and innovation and entrepreneurship competitions for college students, have continuously developed new research results, and some of them have even been directly transformed into productivity, which has greatly pushed forward the process of independent innovation in the region. Entrepreneurship education will promote the development and growth of products, promote regional independent innovation, and ultimately promote the development and growth of the economy

Economic growth also affects the development of entrepreneurship education in colleges and universities. Based on the principle of synergy and adaptability, economic growth plays an important role in the knowledge structure, scale and quality of entrepreneurship education. Economic growth influences the knowledge structure of entrepreneurship education in colleges and universities.

Economic growth means that the economy is changing from low value-added and low-technology content to high value-added and high-technology content, and in this process, it needs to be supported by the production knowledge and labor skills of the workers, so different economies have different requirements on the knowledge, specialty, skills and creativity of talents. Economic growth affects the scale and quality of entrepreneurship education in universities. Economic growth raises the level of economic development and means that the traditional economy, which was originally inefficient and energy-consuming, has been successfully transformed and upgraded, greatly increasing its production efficiency, and a large number of innovative new economies have emerged and risen, which improves the efficiency of the allocation of social resources among the economies, and thus creates more wealth.

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