
Improving the Quality of Education Through Value Co-Creation: A Case Study on Technology-Based Study Programs

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Abstract:

This study aims to improve the quality of education in technology-based study programs through a value co-creation approach. In the context of entrepreneurship education, value co-creation emphasizes active collaboration between students, lecturers, and institutions in creating meaningful learning experiences that are relevant to the development of digital technology. This research adopts a quantitative approach by distributing questionnaires to active students enrolled in entrepreneurship courses at Esa Unggul University, Jakarta, particularly those engaged in technology-based learning through e-learning, digital platforms, and online entrepreneurial activities. To enrich the understanding of learning dynamics, supporting data were also collected through Focus Group Discussions (FGD) with students and lecturers. Quantitative data were analyzed using the Structural Equation Modeling-Partial Least Squares (SEM-PLS) method. The results show that value co-creation has a positive and significant influence on the quality of entrepreneurship education, student satisfaction, and entrepreneurial intention. Furthermore, education quality and student satisfaction significantly affect entrepreneurial intention, which in turn drives entrepreneurial behavior. The integration of technology in learning enhances student participation, strengthens collaborative engagement, and supports the process of joint value creation within a digital educational environment. These findings emphasize that active student involvement in technology-based learning, supported by responsive collaboration from lecturers, can enhance educational quality and foster entrepreneurial behavior. This study provides theoretical and practical contributions for the development of curricula, teaching strategies, and higher education policies that are more participatory, adaptive, and technology-oriented.

Keywords: Value co-creation, entrepreneurship education, educational technology, student satisfaction, entrepreneurial intention, entrepreneurial behavior.

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INTRODUCTION

Education is a vital pillar in national development, building quality human resources prepared to face global challenges (Tinto, 2012). In this context, technology-based entrepreneurship education is increasingly critical, especially amid rapid digital transformation (Sanchez-Gordon & Luján-Mora, 2014). Technology enhances learning by providing new tools and access to knowledge, yet higher education quality in developing countries, particularly entrepreneurship education, still faces significant challenges (Nabi et al., 2017; Rauch & Hulsink, 2015). According to a report by the World Economic Forum, only 60% of students in developing countries express satisfaction with educational quality (Forum, 2020), revealing a gap between expectations and reality (Oliver, 2014).

This gap stems from issues such as outdated curricula, rigid teaching methods—where students are passive recipients—and inadequate facilities (Sugiyono, 2018). To address these challenges, innovative approaches like value co-creation are proposed, emphasizing collaboration between students, lecturers, and institutions (Ranjan & Read, 2016; Walidayni et al., 2023; Prasetyo et al., 2021).

Here, students actively participate as value creators, engaging in co-creating meaningful learning experiences that enhance relevance and impact. Vargo and Lusch state that in this new paradigm, value is created through interaction and participation, not merely transferred from providers to consumers (Vargo & Lusch, 2008).

Value co-creation in entrepreneurship education involves student participation and joint creation with educators, fostering skills like problem-solving, critical thinking, digital literacy, and innovation. This approach aligns with *Service-Dominant Logic*, where value is co-created through interaction. Research shows that active student involvement improves learning outcomes, satisfaction, and motivation, particularly in entrepreneurship programs (Kumari et al., 2019). Furthermore, active engagement in technology-based projects increases students' interest in entrepreneurial ventures (Walidayni et al., 2023).

However, challenges such as limited digital infrastructure, resistance to pedagogical change, and lack of understanding about active student roles remain. Overcoming these barriers is essential, as active participation can enhance perceptions of educational quality—including facilities, responsiveness, assurance, and empathy—thereby boosting student satisfaction and entrepreneurial intentions.

This study focuses on Esa Unggul University students to empirically examine how participation in technology-based entrepreneurship education influences education quality, satisfaction, entrepreneurial intentions, and behaviors—offering theoretical and practical contributions to entrepreneurship curriculum development and policy in Indonesia.

RESEARCH METHODS

This study uses a mixed methods approach to combine the advantages of qualitative and quantitative data in understanding the concept of value co-creation in the context of education (Creswell, 2014). This approach provides a foundation for exploring subjective experiences while testing the relationships between variables statistically.

Qualitative data collection was carried out through in-depth interviews and focus group discussions (FGD) with lecturers and students to explore their perceptions and dynamics of interaction (Stake, 1995). Meanwhile, quantitative data was collected through the distribution of survey questionnaires to measure levels of satisfaction, quality of education, and interest in entrepreneurship (Creswell & Plano Clark, 2011).

This type of research is explanatory that aims to examine the causal relationship between the variables of value co-creation, quality of education, and entrepreneurial interest (Creswell & Creswell, 2017). The research was conducted by designing a case study in the Entrepreneurship study program of Esa Unggul University, to gain an in-depth understanding of the practice and its impact.

The relationship model between variables was analyzed using the Structural Equation Modeling–Partial Least Squares (SEM-PLS) method. This approach allows the analysis of models with many constructs and indicators, as well as mapping the direct and indirect relationships between variables (Hair, 2019).

The research was carried out at the Entrepreneurship Study Program of Esa Unggul University Jakarta from March to June 2025. The sample was selected using purposive sampling techniques from active student populations that met specific criteria such as entrepreneurial experience, e-learning use, and entrepreneurial digital activities (Bougie & Sekaran, 2016).

Respondents' criteria include a minimum age of 17 years, active students or those who have taken entrepreneurship courses, as well as participation in activities such as bazaars, startup programs, or digital entrepreneurship platforms. Students with practical experience are considered representative in understanding and implementing value co-creation (Prahalad & Ramaswamy, 2004).

Data was collected through an online survey using a closed questionnaire based on a 5-point Likert scale. The instrument is developed from relevant theories and has been tested through pre-tests to ensure the validity and clarity of the items (Sugiyono, 2018; Bougie & Sekaran, 2016). The use of online platforms such as Google Form facilitates distribution and time efficiency.

RESULTS AND DISCUSSION

Measurement Model Analysis (Outer Model)

1) Validity Test

Convergent validity and discriminant validity are components to form validity measurements. The Convergent Validity Analysis is determined using the loading factor parameter and using the AVE (Average Variance Extraced) value.

a) Convergent Validity

Convergent validity is the correlation between an indicator score and a construct score. The convergent validity value is a loading factor on the latent variable with its indicator and is expected to have a value of >0.7 and AVE >0.5 . The following loading factor values can be seen in the table below:

Table 1 Loading Factor Values

Indicator	(EB) Entrepreneurial Behavior	(EEQ) Entrepreneurship Education Quality	(NO) Entrepreneurial Intention	(S) Satisfaction	(VCC) Value Co- Creation
EB1	0,780				
EB2	0,837				
EB3	0,800				
EB4	0,801				
EB5	0,749				
EB6	0,798				
EB7	0,790				
EEQ1		0,832			

Indicator	(EB) Entrepreneurial Behavior	(EEQ) Entrepreneurship Education Quality	(NO) Entrepreneurial Intention	(S) Satisfaction	(VCC) Value Co- Creation
EEQ2		0,807			
EEQ3		0,780			
EEQ4		0,815			
EEQ5		0,847			
EEQ6		0,843			
EEQ7		0,806			
EEQ8		0,801			
EEQ9		0,801			
EEQ10		0,783			
EEQ11		0,794			
EEQ12		0,827			
EEQ13		0,825			
EEQ14		0,818			
EEQ15		0,835			
EEQ16		0,795			
EEQ17		0,829			
NO1			0,805		
NO2			0,791		
NO3			0,754		
NO4			0,779		
S1				0,940	
S2				0,920	
S3				0,927	
VCC1					0,804
VCC2					0,752
VCC3					0,761
VCC4					0,794
VCC5					0,752

It can be seen in the table above that all indicators in this study are declared valid, this is because the loading factor value produced by each indicator is >0.7 . And it can be seen in the image below which is an image of the results of the loading factor test on the SmartPLS application as follows.

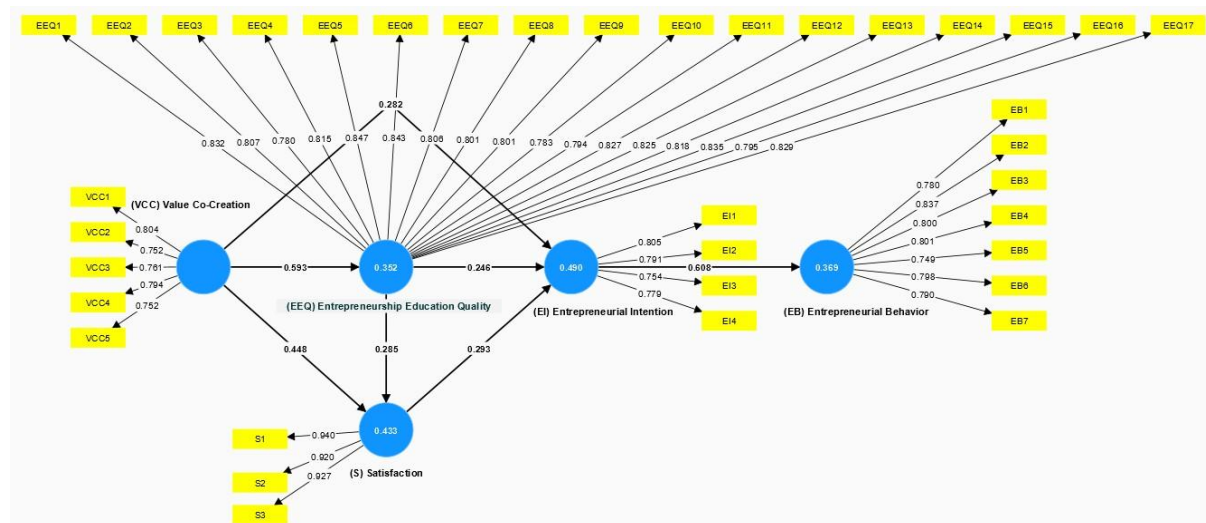


Figure 1. Loading Factor Test Results

Another measurement tool in measuring validity is AVE (*Average Variance Exctrated*). The AVE value must be >0.5 . It can be seen in the table below. That the Satisfaction Variable has the highest AVE value of 0.863. Meanwhile, the one with the lowest AVE value is the CoCreation Value Variable with a value of 0.598.

Tabel 2 Nilai Average Variance Extracted (AVE)

Variable	Average variance extracted (AVE)
(EB) Entrepreneurial Behavior	0,630
(EEQ) Entrepreneurship Education Quality	0,663
(EI) Entrepreneurial Intention	0,612
(S) Satisfaction	0,863
(VCC) Value Co-Creation	0,598

It can be seen from the tab above that the entire AVE value of each variable is >0.5 . It can be concluded that the *loading factor* and AVE values have met the *Convergent Validity* requirements.

b) Discriminant Validity

In *Discriminant Validity*, there are several tests carried out, namely by looking at the value of fornell larcker, HTMT and cross loadings.

1) Fornell Larcker

The fornell larcker criterium value and AVE value are obtained for each indicator from the output results of smart pls as follows:

Table 3. Fornell Larcker Value

Variabel	(EB) Entrepreneurial Behavior	(EEQ) Entrepreneurship Education Quality	(NO) Entrepreneurial Intention	(S) Satisfaction
(EB) Entrepreneurial Behavior	0,794			
(EEQ) Entrepreneurship Education Quality	0,393	0,814		
(EI) Entrepreneurial Intention	0,608	0,575	0,782	

(S) Satisfaction	0,513	0,550	0,603	0,929
(VCC) Value Co-Creation	0,630	0,593	0,609	0,617

The characteristic validity test through the *Fornell-Larcker criteria table* has that the value of the first variable must be greater in the construct of each variable, as seen in the table above. The Entrepreneurial Behavior variable has a value of 0.794 greater than the other variable constructs, the Entrepreneurship Education Quality variable has a value of 0.814 greater than the other variable constructs, the Entrepreneurial Intention variable has a value of 0.782 greater than the other variable constructs and the Satisfaction variable has a value of 0.929 greater than the other variable constructs. It can therefore be concluded that the construct of all variables has met the requirements of the discriminant validity test.

2) Cross loadings

Table 4. Cross Loading Value

Indicator	(EB) Entrepreneurial Behavior	(EEQ) Entrepreneurship Education Quality	(NO) Entrepreneurial Intention	(S) Satisfaction	(VCC) Value Co- Creation
EB1	0,780	0,329	0,447	0,388	0,538
EB2	0,837	0,343	0,573	0,448	0,488
EB3	0,800	0,278	0,485	0,411	0,453
EB4	0,801	0,271	0,459	0,355	0,485
EB5	0,749	0,258	0,389	0,302	0,491
EB6	0,798	0,364	0,508	0,487	0,559
EB7	0,790	0,328	0,485	0,429	0,497
EEQ1	0,316	0,832	0,449	0,402	0,508
EEQ2	0,339	0,807	0,495	0,497	0,514
EEQ3	0,403	0,780	0,514	0,474	0,577
EEQ4	0,349	0,815	0,519	0,477	0,553
EEQ5	0,282	0,847	0,438	0,400	0,468
EEQ6	0,295	0,843	0,437	0,366	0,480
EEQ7	0,290	0,806	0,439	0,413	0,455
EEQ8	0,305	0,801	0,460	0,485	0,432
EEQ9	0,270	0,801	0,390	0,388	0,440
EEQ10	0,285	0,783	0,437	0,489	0,473
EEQ11	0,314	0,794	0,486	0,472	0,462
EEQ12	0,335	0,827	0,503	0,430	0,433
EEQ13	0,357	0,825	0,496	0,409	0,486
EEQ14	0,338	0,818	0,491	0,480	0,453
EEQ15	0,326	0,835	0,485	0,457	0,497
NO1	0,521	0,444	0,805	0,485	0,520
NO2	0,452	0,461	0,791	0,478	0,483
NO3	0,501	0,407	0,754	0,407	0,445
NO4	0,426	0,488	0,779	0,515	0,454
S1	0,469	0,520	0,556	0,940	0,594

S2	0,508	0,534	0,569	0,920	0,579
S3	0,450	0,479	0,555	0,927	0,544
VCC1	0,526	0,486	0,505	0,496	0,804
VCC2	0,615	0,334	0,452	0,373	0,752
VCC3	0,516	0,428	0,420	0,451	0,761
VCC4	0,471	0,468	0,497	0,463	0,794
VCC5	0,350	0,541	0,472	0,569	0,752

Based on the table above, it can be seen that each variable has a cross loading factor value above >0.7 , meaning that the variables in this study have met the requirements.

3) Heterotrait-monotrait ratio (HTMT)

The HTMT ratio is required to be less than 1 so that it can be said to meet the requirements of discriminant validity.

Tabel 5. Heterotrait-monotrait ratio (HTMT)

Variable	Heterotrait-monotrait ratio (HTMT)
(EEQ) Entrepreneurship Education Quality <-> (EB) Entrepreneurial Behavior	0,415
(EI) Entrepreneurial Intention <-> (EB) Entrepreneurial Behavior	0,713
(EI) Entrepreneurial Intention <-> (EEQ) Entrepreneurship Education Quality	0,655
(S) Satisfaction <-> (EB) Entrepreneurial Behavior	0,556
(S) Satisfaction <-> (EEQ) Entrepreneurship Education Quality	0,579
(S) Satisfaction <-> (EI) Entrepreneurial Intention	0,707
(VCC) Value Co-Creation <-> (EB) Entrepreneurial Behavior	0,741
(VCC) Value Co-Creation <-> (EEQ) Entrepreneurship Education Quality	0,647
(VCC) Value Co-Creation <-> (EI) Entrepreneurial Intention	0,747
(VCC) Value Co-Creation <-> (S) Satisfaction	0,694

It can be seen in the table above, all variables have HTMT values below 1, so it can be concluded that these variables pass the HTMT test stage.

Hypothesis Test

Table 6. Hypothesis Test Results

Variable	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
(VCC) Value Co-Creation -> (EEQ) Entrepreneurship Education Quality	0,593	0,593	0,084	7,090	0,000
(VCC) Value Co-Creation -> (S) Satisfaction	0,448	0,440	0,092	4,855	0,000
(VCC) Value Co-Creation -> (EI) Entrepreneurial Intention	0,282	0,284	0,081	3,469	0,001
(EEQ) Entrepreneurship Education Quality -> (S) Satisfaction	0,285	0,288	0,104	2,731	0,006

(EEQ) Entrepreneurship Education Quality > (EI) Entrepreneurial Intention	0,246	0,247	0,099	2,495	0,013
(S) Satisfaction -> (EI) Entrepreneurial Intention	0,293	0,286	0,102	2,868	0,004
(EI) Entrepreneurial Intention -> (EB) Entrepreneurial Behavior	0,608	0,611	0,065	9,333	0,000

The criteria for hypothesis acceptance are that if the T-Statistic is more than 1.96 and the P-Value is less than 0.05, then H_a is accepted and H_o is rejected, and vice versa, as for the hypothesis proposed as follows:

1) First Hypothesis Test

Research Results :

Value Co-Creation Variables Have a Positive and Significant Effect on Entrepreneurship Education Quality Variables. It can be seen from the value of the regression coefficient of 0.593. and from the results of data management, there is a T-Statistical value of 7.090 Greater than the T-Table value of 1.96 with a P-Value value of 0.000 smaller than 0.05, therefore the Value Co-Creation Variable has a Positive and Significant Effect on the Entrepreneurship Education Quality Variable.

2) Second Hypothesis Test Research Results:

Value Co-Creation Variables Have a Positive and Significant Effect on Satisfaction Variables. It can be seen from the value of the regression coefficient of 0.448. and from the results of data management, there is a T-Statistical value of 4.855 greater than the T-Table value of 1.96 with a P-Value value of 0.000 smaller than 0.05, therefore the Value Co-Creation Variable has a Positive and Significant Effect on the Satisfaction Variable.

3) Third Hypothesis Test Research Results:

Value Co-Creation Variables Have a Positive and Significant Effect on Entrepreneurial Intention Variables. It can be seen from the value of the regression coefficient of 0.282. and from the results of data management, there is a T-Statistical value of 3.469 Greater than the T-Table value of 1.96 with a P-Value value of 0.001 smaller than 0.05, therefore the Value Co-Creation Variable has a Positive and Significant Effect on the Entrepreneurial Intention Variable.

4) Fourth Hypothesis Test

Research Results :

Entrepreneurship Education Quality Variables Have a Positive and Significant Effect on Satisfaction Variables. It can be seen from the value of the regression coefficient of 0.285. and from the results of data management, there is a T-Statistical value of 2.731 Greater than the T-Table value of 1.96 with a P-Value of 0.006 smaller than 0.05, therefore the Entrepreneurship Education Quality Variable has a Positive and Significant Effect on the Satisfaction Variable.

5) Fifth Hypothesis Test

Research Results :

The Entrepreneurship Education Quality Variable has a Positive and Significant Effect on the Entrepreneurial Intention Variable. It can be seen from the value of the regression coefficient of 0.246. and from the results of data management, there is a T-Statistical value of 2.495 greater than the T-Table value of 1.96 with a P-Value of 0.013 smaller than 0.05, therefore the Entrepreneurship Education Quality Variable has a Positive and Significant Effect on the Entrepreneurial Intention Variable.

6) Sixth Hypothesis Test

Research Results :

Satisfaction Variables Have a Positive and Significant Effect on Entrepreneurial Intention Variables. It can be seen from the value of the regression coefficient of 0.293. and from the results of data management, there is a T-Statistical value of 2.868 greater than the T-Table value of 1.96 with a P-Value of 0.004 smaller than 0.05, therefore the Satisfaction Variable has a Positive and Significant Effect on the Entrepreneurial Intention Variable.

7) Seventh Hypothesis Test

Research Results :

Entrepreneurial Intention Variables Have a Positive and Significant Effect on Entrepreneurial Behavior Variables. It can be seen from the value of the regression coefficient of 0.608. and from the results of data management, there is a T-Statistical value of 9.333 greater than the T-Table value of 1.96 with a P-Value value of 0.000 smaller than 0.05, therefore the Entrepreneurial Intention Variable has a Positive and Significant Effect on the Entrepreneurial Behavior Variable.

Discussion

The discussion in this study is focused on the relationship between the main variables: Value Co-Creation (VCC), Entrepreneurship Education Quality (EEQ), Satisfaction (S), Entrepreneurial Intention (EI), and Entrepreneurial Behavior (EB).

First, Value Co-Creation (VCC) which consists of two main dimensions—student participation and joint creation—has a positive influence on Entrepreneurship Education Quality (EEQ). This means that the greater the active participation of students in the learning process, such as providing feedback, working together in developing learning solutions, and being involved in evaluation, the higher their perception of the quality of entrepreneurship education. This shows that collaborative involvement can improve the quality of educational services, especially in the aspects of tangibles, reliability, responsiveness, assurance, and empathy.

Second, VCC has also been proven to have a direct effect on Satisfaction (S). Students who feel actively involved in the learning process tend to feel more satisfied with their educational experience (Astin, 2014; Chen, 2018). The collaboration built between students and lecturers, as well as the creation of an interactive learning environment, strengthens students' emotional and cognitive connections to the study program (Hollweck et al., 2019; Liaw & Huang, 2013).

Third, VCC also directly affects Entrepreneurial Intention (EI). Students who are involved in the value creation process feel more confident and motivated to start their own

businesses (Brush & Cooper, 2012; Kautonen et al., 2015). These engagements provide real, contextual experiences that encourage a deeper understanding of entrepreneurship (Bisri & Husni, 2020).

Furthermore, Entrepreneurship Education Quality (EEQ) is not only influenced by VCC, but also has a direct influence on Satisfaction and Entrepreneurial Intention. The quality of education that includes the completeness of facilities, competent lecturers, and a curriculum relevant to the business world is able to form positive perceptions of students, both in the form of satisfaction and intention to be entrepreneurial (Alexander et al., 2019; Bennett, 2020).

The Satisfaction (S) variable also plays a role in driving Entrepreneurial Intention (EI). Students who feel satisfied with the learning process tend to show a stronger intention to engage in entrepreneurial activities (Chen, 2018). This satisfaction reflects a belief that the learning they experience is relevant, rewarding, and applicative (Akçayır & Akçayır, 2017).

Finally, Entrepreneurial Intention (EI) has a significant effect on Entrepreneurial Behavior (EB). The stronger the student's desire or intention to be entrepreneurial, the greater their chances of taking concrete steps, such as starting a small business, participating in business competitions, or joining a digital entrepreneurship community.

Overall, this model shows how students' active involvement (VCC) can directly improve the quality of education and learning satisfaction, which in turn reinforces their actual intentions and behaviors in entrepreneurship. The collaborative and technology-based learning approach is an important strategy in creating graduates who are ready to become entrepreneurs in the digital era.

CONCLUSION

This research demonstrates that active student involvement—through discussion, feedback, and collaboration with lecturers—enhances the quality of entrepreneurship education, leading to greater student satisfaction. Increased satisfaction, in turn, fosters stronger entrepreneurial intentions, which are more likely to translate into actual entrepreneurial behaviors, such as starting a business or engaging in entrepreneurial activities. Thus, higher student engagement in the learning process positively influences satisfaction, intention, and entrepreneurial action. These findings highlight the importance for universities to cultivate collaborative learning environments that support and encourage entrepreneurial spirit. Future research could explore the specific pedagogical strategies and institutional supports that most effectively promote sustained student engagement and successful transition from entrepreneurial intention to behavior across diverse educational contexts.

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