

## Article

# Towards SDGs 4 and 8: How Value Co-Creation Affecting Entrepreneurship Education's Quality and Students' Entrepreneurial Intention

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**Abstract:** Vocational high school (VHS) is a formal education designed to equip students with ready-to-use industrial skills upon graduation. However, its graduates continue to dominate the Open Unemployment Rate, despite the Indonesian government's efforts to incorporate entrepreneurship education into the VHS curriculum. The premise of education as a service with students as the customers has inspired this research to study the phenomena of entrepreneurship education in VHS from the Service-Dominant Logic perspective. This study aimed to investigate the direct effect of students' value co-creation on their entrepreneurial intention and the mediating role of the quality and satisfaction of entrepreneurship education. The PLS-SEM method was applied to analyze 202 samples of VHS students from 13 administrative regions within West Java Province, Indonesia. It was found that students' value co-creation in entrepreneurship education significantly affected the education quality and students' entrepreneurial intention. However, the mediating role of students' satisfaction was significantly influenced by education quality and value co-creation only, while satisfaction itself could not influence entrepreneurial intention. These findings are expected to be considered by the government and VHS to further involve the students in value co-creation since it can enhance the quality of entrepreneurship education and, thus, students' interest in becoming entrepreneurs. The results of this study are committed towards the SDG 4 and 8's initiatives to provide quality education in order to boost entrepreneurship for economic growth.

**Keywords:** entrepreneurial intention; entrepreneurship education quality; satisfaction; value co-creation; vocational high school



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## 1. Introduction

Education is defined as a purposeful, systematic, and sustained effort to transmit knowledge, values, attitudes, skills, or sensibilities. Our contemporary societies have denoted schools as the agency responsible for education that ranging from pre-school, elementary, secondary, to collegiate frameworks [1]. In relation to human capital theory, possession of higher levels of knowledge, skills and relevant competencies are positively correlated with labor market productivity, underscoring the importance of investment in human capital to enhance economic development [2,3]. Consequently, ensuring an inclusive and equitable quality education becomes necessary to substantially increase the number of relevant-skilled youth and adults, including the technical and vocational skills, for employment, decent jobs, and entrepreneurship, as underlined in the United Nations' Sustainable Development Goals 4 [4].

In the case of Indonesia, vocational high school (VHS) is a secondary-level formal education designed to equip students with ready-to-use industrial skills upon graduation [5,6]. As an integral part of national economic development, ironically, the role of VHS has been questioned because their graduates have consistently dominated the Open Unemployment Rate for years. The absence of skills certification, the lack of relevant skilled teachers, and

the mismatch between the number and skills of VHS graduates and industrial demand have worsened the condition [7–9]. Reflecting on that, VHS graduates need to be prepared for another career option, which is becoming entrepreneurs.

Entrepreneurship is believed to be the remedy for unemployment and economic growth problems. As Schumpeter’s “push effect” theory states that entrepreneurship may reduce unemployment, an increased number of enterprises decreases unemployment, and entrepreneurship is an essential engine of job creation and sustainable economic development [10]. Thus, shifting the paradigm of vocational education from traditional to entrepreneurial due to the importance of education as one of the main promoters of Sustainable Development (SD) [11,12].

In response, since 2013 the Indonesian Ministry of Education, Culture, Research, and Technology has decided to incorporate entrepreneurship education into the curriculum of VHS in form of compulsory courses with the aim of generating entrepreneurial graduates who can create jobs, instead of search for jobs [13–15]. After undergoing a curriculum revision, this entrepreneurship education effort has slowly demonstrated a decline in the number of VHS graduates’ unemployment. Although it still indicates the same pattern where VHS graduates remain the largest contributors to the Open Unemployment Rate (Table 1). VHS’s contribution in this matter is called into question because many of its graduates who do not meet the qualifications required by the sector, at the same time are not ready to be entrepreneurs. Consequently, it is necessary to further study the effectiveness of entrepreneurship education in VHS and various factors that affect the entrepreneurship of VHS graduates, especially in an Indonesian context.

**Table 1.** Indonesian Open Unemployment Rate by educational level.

Level of Education	Open Unemployment Rate by Educational Level (%)						
	2015	2016	2017	2018	2019	2020	2021
Never Go to School/Not Graduated and Graduated from	2.71	2.95	2.62	2.40	2.39	3.61	3.61
Elementary School							
Junior High School	6.24	5.84	5.52	4.77	4.72	6.46	6.45
Senior High School	10.27	8.63	8.32	7.90	7.87	9.86	9.09
Vocational High School	13.02	11.49	11.38	11.18	10.36	13.55	11.13
Diploma I/II/III	7.22	5.03	6.86	6.00	5.95	8.08	5.87
University	5.98	4.54	5.25	5.88	5.64	7.35	5.98

Source: [16].

Previous studies tried to expose the effectiveness of entrepreneurship education with different aspects being emphasized, from exploring factors that affect the entrepreneurship education implementation [17–19], the entrepreneurship education learning models [19–22], to the effect of entrepreneurship education towards students’ entrepreneurial intention [23]. A number of empirical research, however, revealed that formal education fails to achieve entrepreneurial education outcomes [17,24,25]. Further, research on the effectiveness of entrepreneurship education in Indonesian VHS by Winarno [17,18] and Anggraini & Sukardi [19] indeed exposed that: (1) the entrepreneurship learning materials and methods are not effective enough in developing student entrepreneurial attitudes, (2) most VHS teachers have not been trained in entrepreneurship and lacked knowledge on the right approach to teaching entrepreneurship, and (3) the short time allocation for entrepreneurship subjects limits the movement of teachers to develop an innovative entrepreneurship education learning model. From this point of view, education can be seen as a service that involves interrelated components such as the learning materials, methods, models, and the teachers who delivered it to the students as the beneficiaries. However, previous research missed to study the quality of these entrepreneurship education components and its effect on student entrepreneurial intention. Many studies have been conducted

on quality teaching and learning determinants across many fields without a particular emphasis on entrepreneurship education of vocational schools [26].

Furthermore, Vargo & Lusch [27] added from the perspective of Service–Dominant Logic (S–D Logic) that a value in service is always uniquely and phenomenologically determined by the beneficiaries, which highlights the importance of understanding what the students need from the entrepreneurship education by involving them in a value co-creation process. Through this process, student resources are integrated with institutional resources, allowing for the tailoring of educational services to meet the specific needs of students and, as a result, assisting in the development of a unique learning experience for them and improving their outcomes [28,29]. Meanwhile, from the service marketing view, co-creation was also found to positively affect customer evaluations of service quality since a co-created service can better satisfy personal needs and stimulate intention to re-purchase [30,31]. A few recent studies [32–37] have begun to explore the value of applying service marketing concepts to the higher education sector. In this sense, these concepts are assumed to work within entrepreneurial education context as well, which previous studies have not investigated yet. Obviously, a major opportunity exists to deepen our understanding and ultimately inform improvements in practice by applying both service marketing and entrepreneurship education concepts, thereby trying to integrate and synthesize these two distinct literatures.

Therefore, the premise of education as a service with students as the beneficiaries/customers have inspired this research to study the phenomena of entrepreneurship education in vocational high school (VHS) from the perspective of Service–Dominant Logic. While the S–D Logic theory was originally born in service marketing field, and thus, a lot of research is advancing rapidly there [27], this research is one of the few studies that tried to examine value co-creation within the entrepreneurial education context [38], particularly in vocational schools. Does involving students in value co-creation affect the quality of the entrepreneurship education as a service and, thus, better satisfy the students' needs and enhance their intention to engage in entrepreneurship? Answering to that research question, this study aimed to investigate the direct effect of students' value co-creation on their entrepreneurial intention, and the mediating role of entrepreneurship education quality and satisfaction as the novelty. Findings of this study will add to conceptual knowledge and managerial implications that the government and schools can consider in developing entrepreneurship education in VHS.

This paper is delivered in the following structure: After this introduction to the phenomena and research objectives, the supporting literature review and hypothesis are presented in Section 2. Furthermore, the methods of data collection and analysis are explained in Section 3, followed by the results and discussions in Section 4, then closed by Section 5 presenting the conclusions, implications, and limitations of the study accompanied with future research directions.

## 2. Literature Review

### 2.1. Theoretical Background

Entrepreneurship and innovation have been widely acknowledged as driving forces of economic growth and social development [39–44]. This has triggered the rise in national and regional policies that incorporate entrepreneurship and innovation activities and outcomes, including entrepreneurship education as a significant link in the establishment of new enterprises and the cultivation of innovative talents, scientific, and technological innovation [42,45–49]. Entrepreneurship education has consequently become a focal point in national strategies of various countries and regions, for instance, the United Nation's World Youth 2030 Agenda [3], the Small Business Innovation Research program of the US [50], the European Education Area of the European Union [51–53], the Innovation-driven development strategy of China [10,54], and the 2015–2025 Malaysia Education Blueprint [55]. Given the significance, it has also increased the demand for a quality entrepreneurial education that can effectively support these policies [56–61].

Entrepreneurship education encompasses both formal and informal processes that foster the mindset, knowledge, skills, and abilities needed to thrive in an entrepreneurial society [59]. Entrepreneurship education is indeed positively linked to entrepreneurial human capital assets and entrepreneurial outcomes, i.e., new venture creation and entrepreneurial performance [62]. Teaching approaches in entrepreneurship education itself vary from primarily theoretical to predominantly applied, linked to different learning objectives and outcomes [63–67]. St-Jean & Audet [68] posit three objectives for entrepreneurial learning: (1) the affective, related to values and motivations; (2) the cognitive, dealing with formal concepts and knowledge organization; and (3) the skill-based, adhered to technical mastery. However, the classical model of classroom teaching only covers the cognitive outcome with a minor aspect of entrepreneurial competencies. Studies have therefore emphasized new approaches to teaching entrepreneurship that go beyond the traditional classroom setting [69–71]. Politis [72], influenced by Kolb's [73] experience-based learning approach, proposed a framework in which the students go through real-world experiences or venture creations and learn after reflecting on them. Neck & Greene [66] created a pedagogical portfolio centered on the development of activities for reflective practice, ranging from simulations and games to the creation of real companies, in order to bridge the gap between classroom and practice-based learning. All of these studies agree that entrepreneurship education requires more hands-on activities through a learning-by-doing approach. In relation to the quality, Fayolle et al. [74] proposed that because entrepreneurship education is a dynamic education system in which theoretical construction and practical operation coexist, the evaluation of entrepreneurship education quality should primarily include the paradigms of process factor evaluation and impact evaluation. Process factor evaluation is the evaluation of each element that constitutes the entrepreneurship education, whereas impact evaluation is an assessment of the effect of self-changes after receiving the entrepreneurship education [75].

Talking about the Indonesian vocational high school (VHS), it is known for its emphasis on practical skills mastery with a unique characteristic of 70% practical and 30% theoretical learning [76], including in its entrepreneurship education. First initiated in 2013 and revised in 2018, the recent version of VHS entrepreneurship education adopts an experiential learning approach comprised of two compulsory courses of Creative Products and Entrepreneurship (Produk Kreatif dan Kewirausahaan—PKK) and Digital Communication and Simulation (Simulasi dan Komunikasi Digital—SKD) and a supplementary program of The Entrepreneurs School (Sekolah Pencetak Wirausaha—SPW). All students are subjects to these compulsory courses, PKK and SKD, which serve as the foundations for students to learn entrepreneurship and business management knowledge and ICT use in it. Additionally, the SPW program acts as an extension to the compulsory courses, which aims to increase the quantity and quality of VHS graduates who become entrepreneurs. As a prerequisite to joining, students must already create a venture for they are required to run a business under intensive mentoring from teachers and business communities alongside regular monitoring of their financial performance [13,15]. These PKK, SKD, and SPW efforts are integrated and complementary. Materials and activities within are delivered in collaboration between VHS teachers and guest lecturers, both academicians and practitioners. Aids to seed funding and marketing are also provided for the students. In fact, this kind of experiential learning approach needs a vibrant ecosystem of collaborators that integrate resources and exchange services over complementary institutional arrangements [70,77,78].

From this point of view, education is recognized to be a service ecosystem [77]. Education as a service means that it is a value co-created by the interactions of customers and providers [79]. Entrepreneurship education is delivered to students as customers upon a collaboration of multi providers, both internal and external, i.e., teachers, government, university, industry, community, and media [53,80–82], which involves the components of education and training programs (curriculum and co-curricular activities), human capital, infrastructure, finance, and market where all of them are connected over institutional arrangements of network, policy, and culture [83–85]. Therefore, Regele & Neck [86] viewed

entrepreneurship education as a nested sub-ecosystem within the larger entrepreneurial ecosystem because their built-in is in accordance with Stam's [87] and Bruns, Bosma, Sanders & Schramm's [88] definition of the entrepreneurial ecosystem as a set of interdependent actors and components coordinated in such a way that they promote entrepreneurship activities within a particular territory and resulting on economic growth. Entrepreneurship education should therefore be understood within the context of a wider system [89]. Hence, the effectiveness of entrepreneurship education in VHS can be evaluated using the entrepreneurial ecosystem approach, particularly on the evaluations of these entrepreneurship education components' quality and its effect on students' entrepreneurial intention [74,75]. Especially considering that most developing countries, including Indonesia, confront challenges associated with quality assurance in vocational education because of unequal regional development commonly in terms of economic, infrastructure, and human capital [90,91].

Quality assurance (QA) in teaching and learning, according to Gasmelseed [92], can support effective and efficient vocational education systems that can significantly contribute to the socioeconomic development of a nation. Thus, in most developing countries, QA best practices in teaching and learning are required to achieve the objectives of vocational schools [93]. Recent scholars in education settings have stressed the significance of teaching quality to improve student learning outcomes [94]. In service management, it is important to understand how clients assess the quality of the service provided, that is, how quality is perceived by the client [95,96]. Education as a service industry must therefore strive to identify the expectations and needs of its clients, who are the students [96,97]. SERVQUAL by Parasuraman et al. [98,99] is a well-known instrument for measuring customer perceptions of service quality, which include multi-item measures of service processes, interpersonal factors, and physical evidence—the three distinct components of service quality [32]. Whereas education is considered a service ecosystem, this paper hence, adopted the five generic dimensions of SERVQUAL to measure the quality of entrepreneurial ecosystem elements that assembly the entrepreneurship education in VHS. SERVQUAL is also much-used to measure the quality in education context [32,96,100–103].

In education, students are the customers who interact with service providers of an educational institution for the purpose of acquiring goods or services [104]. Among all stakeholders of the educational quality, students are regarded to be the most important one as they are directly impacted by the quality of service [102]. On the other hand, the Indonesian government is commonly known for using a top-down approach when establishing policy for entrepreneurship education in VHS; consequently, mismatches in the relevancy may occur. Within an ecosystem itself, the driver power generated from the actor element is the top management. Therefore, in Indonesia, the approach taken to encourage awareness of entrepreneurialism is a top-down approach [82], although a bottom-up approach is also frequently used in several other countries [80]. From the perspective of Service-Dominant Logic, Vargo & Lusch [27] further argued that a value in service is always uniquely and phenomenologically determined by the beneficiaries, making it necessary for the government as policymaker and regulator and the schools as implementers to understand what the students need from entrepreneurship education by involving them in value co-creation.

## *2.2. Effect of Value Co-Creation on Entrepreneurship Education Quality, Satisfaction, and Entrepreneurial Intention*

Grounded in Service-Dominant Logic and service marketing field, value co-creation is described as the joint creation of value by the company and the customer, enabling the customers to co-create the service experience in order to best fit their needs [28,105]. In this study, value co-creation is conceptualized as a higher-order construct comprising two sub-factors of student participation and joint creation. While student participation emphasizes the active involvement of students within the process [106], joint creation underlines the importance of teachers and students to co-create the student experience [107], in which

value co-creation cannot take place without the existence of these two subfactors [108]. Thus, value co-creation is an essential component of the student experience.

The manifestation of co-creation is likely to affect or generate 'quality perceptions' of the goods or services that are mutually conceived and produced [36]. According to Grönroos & Voima [30] and Kasnakoglu [31], co-creation is most likely to positively influence customer evaluations of service quality because co-created services can better satisfy personal needs, offer superior customer-service fit, build a sense of ownership, and foster appreciation of the outcome quality.

**Hypothesis 1 (H1).** *Value co-creation positively affects entrepreneurship education quality.*

However, education is not a one-sided service; it is emphasized that, in order to attain the desired outcomes, students must actively participate [29,109]. Research by Giner & Rillo [110], Nystrand & Gamoran [111], and Sutarso et al. [112] exposed that co-creation has a strong and positive impact on student achievement and is therefore fundamental to student satisfaction.

**Hypothesis 2 (H2).** *Value co-creation positively affects satisfaction.*

Grönroos & Voima [30] believed that the co-creation experience may affect customers' perceptions about the goods and services, and even the organization itself, including its constituents, that ultimately influences their repurchase intention. In terms of entrepreneurship education, a cross-country study by Misiak-Kwit et al. [38] found a very strong association between co-creation experience and entrepreneurial intention. If an individual wanted to conduct their own business in the future, they would be willing to gain experience or be open to cooperation with companies, be it through co-creation. Furthermore, a person's actual inclination to start their own enterprise is often revealed only after gaining the experience contributing to the achievement of business success [113].

**Hypothesis 3 (H3).** *Value co-creation positively affects entrepreneurial intention.*

### *2.3. Effect of Entrepreneurship Education Quality on Satisfaction and Entrepreneurial Intention*

Service quality is an overall evaluation of tangible and intangible service attributes from customers' standpoint [114] by comparing their expectations versus experience [99,115]. Customers perceived service quality as good when their perceptions meet or exceed their expectations. Filling the gaps between customer perceptions and expectations about the service received is thus, vital for customer satisfaction [101]. Accordingly, the education quality perceived by students was found to be a direct causal factor of their satisfaction [116,117].

In this study, the quality of entrepreneurship education perceived by students is conceptualized as a higher-order construct comprising five subfactors of the SERVQUAL dimensions (tangibility, reliability, responsiveness, assurance, and empathy) of the entrepreneurial ecosystem components, i.e., curriculum and co-curricular activities, human capital, infrastructure, and access to funding and the market that support the operationalization of entrepreneurship education at their schools [53,80–85,99]. The five generic dimensions of SERVQUAL are defined as follows: (1) Tangibles: Appearance of the physical facilities, equipment, personnel, and communications materials; (2) Reliability: Ability to perform the promised service reliably and accurately; (3) Responsiveness: Willingness to help customers and provide prompt service; (4) Assurance: Knowledge, attention, and skills shown by the personnel that inspire credibility and trust; and (5) Empathy: An effort to understand the perspective of the user through individual attention [99,118].

**Hypothesis 4 (H4).** *Entrepreneurship education quality positively affects satisfaction.*

Entrepreneurship education focuses on enhancing entrepreneurial skills, knowledge, and experience to raise students' awareness and intention of entrepreneurship for a ca-

reer path to work [119]. Previous studies demonstrated a robust correlation between entrepreneurship education and entrepreneurial intentions [120–123] and that the higher the quality of entrepreneurship education delivered to students, the higher students' intention in entrepreneurship [124–126].

**Hypothesis 5 (H5).** *Entrepreneurship education quality positively affects entrepreneurial intention.*

#### 2.4. Effect of Satisfaction on Entrepreneurial Intention

Students' satisfaction is a subjective and short-term attitude resulting from a judgment of students' educational experience [127]. Measuring student satisfaction is crucial for evaluating and improving education quality, e.g., teaching and curriculum design [128]. A strong correlation was found between satisfaction and positive behavioral intention [117,129]. Satisfied customers are likely to present favorable interpretations of the company, product or brand, i.e., spreading recommendations or returning later to buy the same products. In regards, feeling satisfied by the quality of entrepreneurship education is assumed to create favorable interpretations and stimulate students' entrepreneurial intention.

**Hypothesis 6 (H6).** *Satisfaction positively affects entrepreneurial intention.*

Entrepreneurial intention itself is defined as the conscious decision of aspiring to engage in a self-owned business and planning to do so in the future [130]. The effectiveness of entrepreneurship education has been widely measured through the intention of the students in becoming entrepreneurs since intention has been shown to be a consistent predictor towards behavior [131,132]. The intention is a bridge between ideas and actions [133]; thus, the entrepreneurial intention is a prerequisite state for students to start their own business [134].

### 3. Research Methodology

This research tried to study the phenomena through positivistic paradigm as it aimed to explain the direct effect of students' value co-creation on their entrepreneurial intention and the mediating role of entrepreneurship education quality and satisfaction. The judgments were made based on measurable facts (quantitative data), so it remained objective on the ontological assumption. As the researchers, we chose to embrace realism and detach our own values and beliefs throughout the research process [135,136]. Furthermore, since this research aimed to explain the effect of given variables; therefore, the appropriate approach to theory development for this research is a deductive by started from composing the hypotheses according to previous literature and then testing them in the real case of VHS within West Java Province, Indonesia [136]. The data collection was administered using a cross-sectional questionnaire survey undergoing a metric scale to measure the variables (mono method quantitative). A quantitative survey is the appropriate strategy to achieve the objectives of this research for it is highly valuable for studying problems such as public opinion, it can reach a considerably wider audience. In other words, it is more convenient for results generalization [137]. This strategy can be used to interpret statistical analysis to predict the future or describe the characteristics of the past [138]. The data were then analyzed using PLS-SEM to see the effects of each variable.

The PLS-SEM method was adopted due to its compatibility for early stages (exploratory) and predictive applications and its ability to handle reflective-formative and higher-order models [139]. The model in this research is classified as hierarchical latent variables of a reflexive-formative type [140] containing four latent variables: VCC, EEQ, S, and EI, where the LOCs are reflective and the HOCs are formative. Therefore, a two-stage approach was applied because it has the advantage of estimating a more parsimonious model; there is no need to represent the LOCs (Figure 1) besides being adequate to emphasize the relationships between the HOCs (Figure 2) [140].

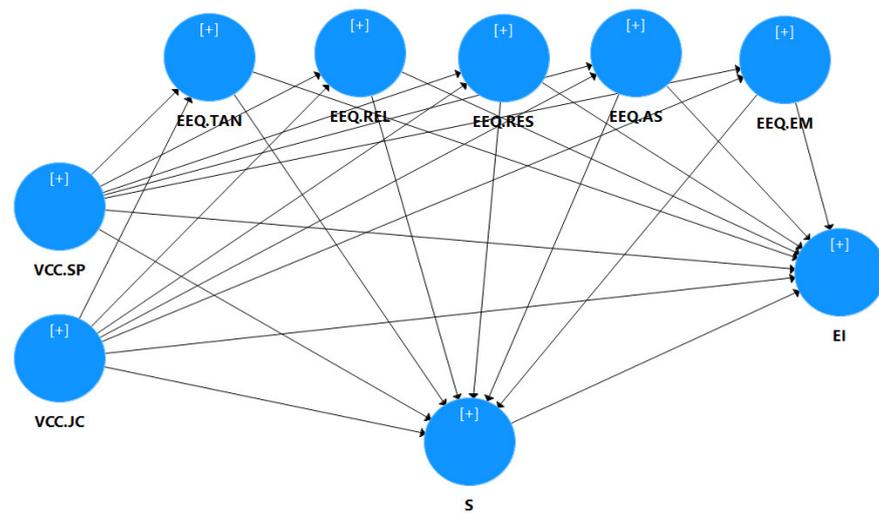


Figure 1. First-stage model (LOCs) in the two-stage approach.

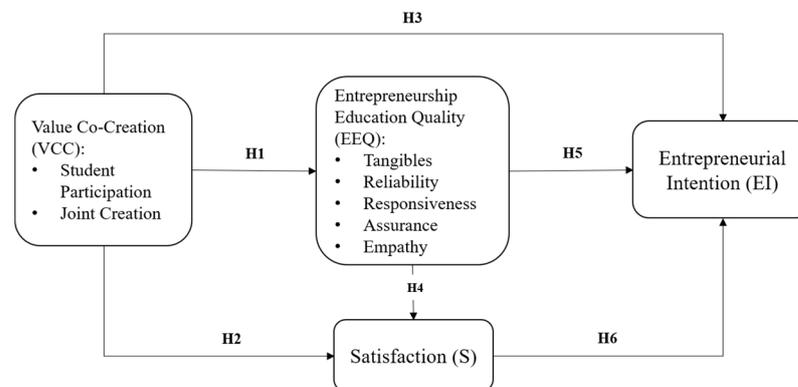


Figure 2. Second-stage model (HOCs) in the two-stage approach.

The sample size suggested was 84 in order to attain 80% statistical power with a maximum number of 8 arrows pointing at a construct (Figure 1), a minimum  $R^2$  of 0.25, and a significance level of 5% [139,141]. Thus, considering West Java as the province with the largest number of vocational high schools [142], this study took 202 samples of VHS students from 45 schools in 13 administrative regions within this province [143].

Nevertheless, several limitations occurred prior to the data collection. In order to minimize bias, the questionnaire items were validated beforehand by one VHS student, one VHS teacher, and two university faculty members of the entrepreneurship department. These people were chosen because of their status as insiders and someone who is familiar with entrepreneurship education. Regarding ethics, since the samples involved were underage students (16–18 years old), the questions were designed to focus on variable measurement and general information only, besides a data confidentiality guarantee. Furthermore, the questionnaire was disseminated by the Committee of West Java Province's Sekolah Pencetak Wirausaha (SPW) program to make sure this research was done under the consent of both the students and the teachers as their Godparents at school.

Data collection was carried out through online questionnaire that measured four constructs of value co-creation, entrepreneurship education quality, satisfaction, and entrepreneurial intention undergoing a 5-point Likert Scale expressing “strongly disagree/unavailable” (1) to “strongly agree/available” (5) using measurement items from the literature. Value co-creation (VCC) was conceptualized as a higher-order construct with two subfactors of student participation (SP) and joint creation (JC) and measured using items from Maxwell-Stuart et al. [34]. Furthermore, to gain insight on entrepreneurial intention (EI) of the students, this paper adopted measurement items from Mueller & Thomas [144], Kristiansen & Indarti [145],

Liñán & Chen [146], Mouselli & Khalifa [147], and items from Sultan & Wong [35] for their satisfaction (S). Lastly, to measure students' perception towards the entrepreneurship education quality (EEQ), this paper expanded measurement items from Sultan & Wong [35], Campos et al. [148], and Wafudu et al. [26] in order to better capture the entrepreneurial ecosystem elements from Brush [84], Etzkowitz et al. [80], Isenberg [85], Liu et al. [81], Novela et al. [82], Toutain & Mueller [53], and the World Economic Forum [83] through the SERVQUAL dimensions of Parasuraman et al. [99]. Following SERVQUAL, the EEQ construct was conceptualized as a higher-order with five subfactors of tangibles (TAN), reliability (REL), responsiveness (RES), assurance (AS), and empathy (EM) with adjusted wording of the questions tailored to the specific service application of entrepreneurship education within Indonesian vocational high schools in a language with which the respondents can identify, as suggested by Parasuraman et al. [149]. The precise measurement items were provided in (Table 2). Data analysis was performed using SmartPLS 3 software in the following procedures: (1) evaluation of the measurement model and (2) the structural model with a two-stage approach.

**Table 2.** Assessment of the measurement model.

Construct and Indicator		LOC's				HOC's	Descriptive Statistics	
		Loadings	CR	AVE	$\alpha$	Outer Weights	Mean (%)	St.d.
Value Co-Creation (HOC)—Student Participation (LOC)	VCC.SP		0.917	0.788	0.865	0.487	70.66	1.12
I often tell the teachers what I need from this entrepreneurship education	VCC.SP1	0.859						1.11
I often give suggestions how this entrepreneurship education can be improved	VCC.SP2	0.920						1.15
I participate in making decisions about how this entrepreneurship education should work	VCC.SP3	0.883						1.11
Value Co-Creation (HOC)—Joint Creation (LOC)	VCC.JC		0.894	0.738	0.822	0.595	76.44	1.01
During the learning process, I often find solutions to my problems together with the teachers	VCC.JC1	0.885						1.00
I am actively involved when teachers composing this entrepreneurship education program	VCC.JC2	0.845						1.03
Teachers always involve students in evaluating and improving the learning process	VCC.JC3	0.846						0.91
Entrepreneurship Education Quality (HOC)—Tangibles (LOC)	EEQ.TAN		0.821	0.435	0.741	0.229	71.02	1.48
The available infrastructure supports my learning process in entrepreneurship	EEQ.TAN1	0.664						0.90
The available facilities support my learning process in entrepreneurship	EEQ.TAN2	0.719						0.87

Table 2. Cont.

Construct and Indicator		LOC's				HOC's	Descriptive Statistics	
		Loadings	CR	AVE	$\alpha$	Outer Weights	Mean (%)	St.d.
The available teachers support my learning process in entrepreneurship	EEQ. TAN3	0.642						0.83
The available guest lecturers support my learning process in entrepreneurship (if unavailable, answer with value of 1)	EEQ. TAN4	0.699						1.63
The available seed funding supports my learning process in entrepreneurship (if unavailable, answer with value of 1)	EEQ. TAN5	0.597						1.70
The available assistance to market access supports my learning process in entrepreneurship (if unavailable, answer with value of 1)	EEQ. TAN6	0.627						1.68
Entrepreneurship Education Quality (HOC)—Reliability (LOC)	EEQ. REL		0.880	0.553	0.838	0.246	75.78	1.34
The knowledge possessed by the teachers support my learning process in entrepreneurship	EEQ. REL1	0.806						0.78
The knowledge possessed by the guest lecturers support my learning process in entrepreneurship (if unavailable, answer with value of 1)	EEQ. REL2	0.636						1.65
The teachers' ability in delivering material supports my learning process in entrepreneurship	EEQ. REL3	0.799						0.81
The guest lecturers' ability in delivering material supports my learning process (if unavailable, answer with value of 1)	EEQ. REL4	0.622						1.63
The materials delivered are suitable with what I need in managing a business	EEQ. REL5	0.764						0.88
The applied learning methods support my learning process in entrepreneurship	EEQ. REL6	0.808						0.89
Entrepreneurship Education Quality (HOC)—Responsiveness (LOC)	EEQ. RES		0.936	0.880	0.864	0.241	85.00	0.83

Table 2. Cont.

Construct and Indicator		LOC's			HOC's		Descriptive Statistics	
		Loadings	CR	AVE	$\alpha$	Outer Weights	Mean (%)	St.d.
The teachers are responsive in helping students in the learning process	EEQ. RES1	0.941						0.85
The teachers are solution-oriented in helping students in the learning process	EEQ. RES2	0.936						0.81
Entrepreneurship Education Quality (HOC)—Assurance (LOC)	EEQ. AS		0.953	0.801	0.938	0.233	83.60	0.83
The teachers give clear instructions	EEQ. AS1	0.882						0.84
The teachers provide clear standards	EEQ. AS2	0.911						0.81
The standard of the material provided guarantees good learning outcomes	EEQ. AS3	0.923						0.83
The standard of assignment given guarantees good learning outcomes	EEQ. AS4	0.880						0.82
The applied grading criteria guarantees good learning outcomes	EEQ. AS5	0.878						0.83
Entrepreneurship Education Quality (HOC)—Empathy (LOC)	EEQ. EM		0.921	0.794	0.870	0.215	87.26	0.81
The teachers are always open for questions & answers and consultation in the learning process	EEQ. EM1	0.861						0.78
The teachers are always open to listen to students' difficulties in the learning process	EEQ. EM2	0.921						0.79
The teachers always doing evaluation and improvement for the betterment of the learning process	EEQ. EM3	0.891						0.85
Satisfaction (HOC)	S		0.929	0.814	0.886		82.84	0.86
Overall, I am satisfied with the entrepreneurship education at VHS	S1	0.909						0.86
Overall, entrepreneurship education at VHS has fulfilled my needs in learning entrepreneurship	S2	0.895						0.89
Overall, entrepreneurship education in VHS is already good	S3	0.904						0.82
Entrepreneurial Intention (HOC)	EI		0.916	0.686	0.885		86.06	0.89
I am ready to be an entrepreneur	EI1	0.864						0.88
I will put forth every effort to start and run my own business	EI2	0.865						0.77
My professional aspiration is to be an entrepreneur	EI3	0.833						0.96

Table 2. Cont.

Construct and Indicator		LOC's			$\alpha$	HOC's	Descriptive Statistics	
		Loadings	CR	AVE		Outer Weights	Mean (%)	St.d.
I am determined to create my own business in the near time	EI4	0.820						1.02
I am determined to create my own business in the future	EI5	0.754						0.71

Mean (%) is the average of all respondents' assessments turned into a percentage.

#### 4. Results and Discussion

##### 4.1. Stage One: Analysis of the LOC Measurement Model

Convergent and discriminant validity tests were undertaken to ensure that the indicators of each construct assess what they are supposed to assess. Firstly, indicator loadings, composite reliability (CR), average variance extracted (AVE), and Cronbach's alpha ( $\alpha$ ) were employed to test convergent validity (Table 2). All indicator loadings were accepted in the models with a reliability threshold of 0.55, as this cut-off is still considered good [150]. For all reflective constructs, the CR and  $\alpha$  reached values above the required thresholds of 0.7 [151]. The AVE surpassed the threshold of 0.5 for all constructs [151] except the "tangibles", but since its CR and  $\alpha$  surpassed the threshold; therefore, it was still accepted [152].

Secondly, discriminant validity was tested in two ways: Fornell-Larcker criterion and cross loadings. In the Fornell-Larcker criterion (Table 3), the "reliability" construct appeared to be more correlated with the other construct of "tangibles". However, since their values were only slightly different and furthermore, the cross loadings of all indicators were surpassed, which meant that all indicators already represented the proper constructs; hence, this occurrence was still accepted. At this stage, the LOC measurement model was proven reliable and valid so that the analysis could proceed.

Table 3. Fornell-Larcker criterion.

	EEQ.AS	EEQ.EM	EEQ.REL	EEQ.RES	EEQ.TAN	EI	S	VCC.JC	VCC.SP
EEQ.AS	<b>0.895</b>								
EEQ.EM	0.736	<b>0.891</b>							
EEQ.REL	0.743	0.672	<b>0.744</b>						
EEQ.RES	0.790	0.786	0.714	<b>0.938</b>					
EEQ.TAN	0.537	0.479	<b>0.745</b>	0.518	<b>0.659</b>				
EI	0.303	0.401	0.396	0.367	0.365	<b>0.828</b>			
S	0.677	0.592	0.657	0.694	0.581	0.324	<b>0.902</b>		
VCC.JC	0.506	0.470	0.596	0.491	0.597	0.388	0.550	<b>0.859</b>	
VCC.SP	0.432	0.290	0.411	0.414	0.417	0.399	0.439	0.706	<b>0.887</b>

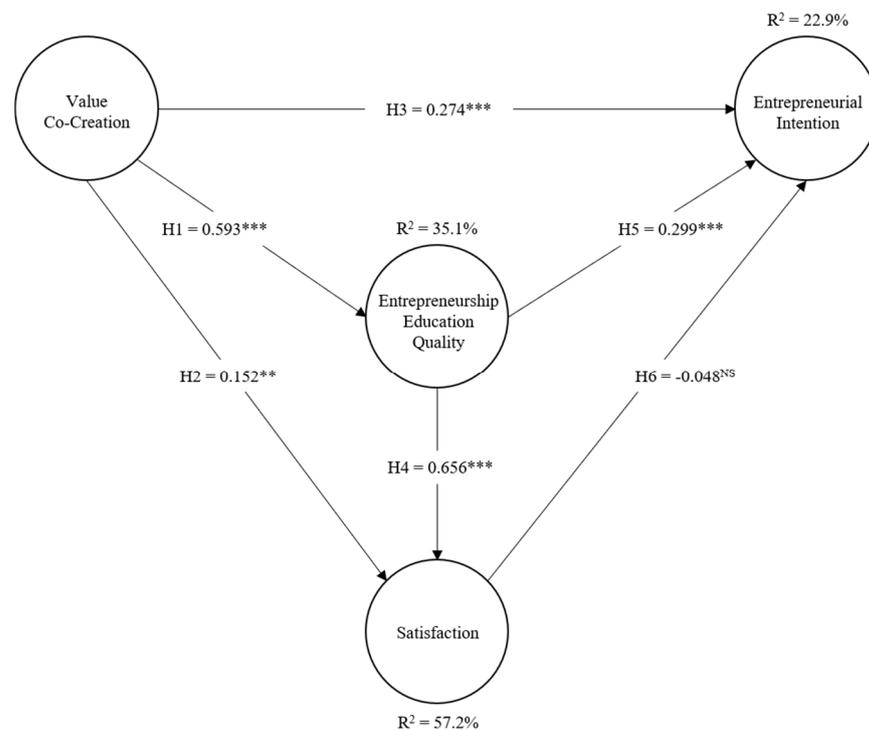
##### 4.2. Stage Two: Analysis of the HOC Measurement Model

In this second stage, latent variable scores (LVS) gained from the first stage were saved and added as new variables to the dataset and utilized the same analysis criteria as in the first stage [140]. For convergent validity tests, the CR and  $\alpha$  reached values above the required thresholds of 0.7 and AVE threshold of 0.5 for all constructs [151]. The discriminant validity also showed promising results both from the Fornell-Larcker criterion and cross loadings, which indicated that all of the constructs were sufficiently distinct from each other and all of the indicators already represented the proper constructs. To conclude, both the LOC and HOC measurement models in this research were proven to be reliable and valid.

### 4.3. Results of the Structural Model

After the measurement model was approved, we evaluated the structural model's quality through VIF,  $R^2$ , and  $Q^2$  procedures as recommended by Hair et al. [153]. Analysis showed that the model had no multicollinearity issues because each variable in the model had a VIF coefficient lower than 5.0. The  $R^2$  test was deployed to show the share of variance in endogenous variables that could be explained in this model. It was found that the model could explain 22.9% variance in entrepreneurial intention, 35.1% in entrepreneurship education quality, and 57.2% in satisfaction. These were categorized as substantial effects according to Cohen [141]. Besides using  $R^2$  to evaluate predictive precision,  $Q^2$ , which is an indicator of predictive relevance, was also calculated [154]. The  $Q^2$  values above 0.02, 0.15, and 0.35, respectively, demonstrate the model's small, medium, and large predictive relevance. Analysis revealed that EEQ and EI constructs had  $Q^2$  values above 0.15 (0.251 and 0.199, respectively), while the  $Q^2$  value of S construct was 0.563 (higher than 0.35). Therefore, the quality of this structural model was proven.

Next, hypothesis testing was performed using the non-parametric bootstrapping technique with 5000 subsamples at a 5% significance level and one-tailed test type [139]. In addition to the direct effect, mediation analysis was also conducted within the bootstrapping [154]. Five out of six hypotheses were supported in the model (Figure 3), where their path coefficients had the hypothesized direction (positive) and were significant at least at a 5% significance level. This study revealed that value co-creation had a direct effect on entrepreneurship education quality (H1:  $\beta = 0.593$ ,  $p < 0.000$ ) and entrepreneurial intention (H3:  $\beta = 0.274$ ,  $p < 0.001$ ), in addition to the partial mediating role of entrepreneurship education quality towards entrepreneurial intention (H5:  $\beta = 0.299$ ,  $p < 0.006$ ). Above all, entrepreneurship education quality and satisfaction had the strongest effect relationship (H4:  $\beta = 0.656$ ,  $p < 0.000$ ). However, the mediating role of students' satisfaction was unsupported because satisfaction was only able to be influenced by education quality and value co-creation (H2:  $\beta = 0.152$ ,  $p < 0.011$ ), while it could not influence entrepreneurial intention as the path was negative and not significant at all (H6:  $\beta = -0.048$ ,  $p < 0.319$ ).



**Figure 3.** Results of the structural model. \*\* = significant at 5%; \*\*\* = significant at 1%; NS = not significant.

Additionally, Cohen's [141] effect size ( $f^2$ ) was tested to assess the contribution of the exogenous construct towards the endogenous construct. Analysis showed that almost all of the  $f^2$  values within the inner model surpassed 0.02; thus, there was a satisfactory effect for the endogenous constructs in this model [155]. However, an exception was found for the  $f^2$  between satisfaction and entrepreneurial intention constructs, which only scored 0.001 due to the negative and insignificant effect between them.

#### 4.4. Discussion

This study captured the foremost insight of value co-creation as a positive endeavor in entrepreneurial education that impacts a favorable attitudinal shift of the students [36]. Value co-creation leads to the appreciation of the entrepreneurship education quality delivered by the schools and the government—the Indonesian Ministry of Education, Culture, Research, and Technology. Since perceived service quality is based on the comparison between expectations and actual performance, when the student who is a value co-creator is involved in the pre-consumption stages of the value creation process, the post-consumption evaluations will be more appreciated; thus, stimulating enthusiasm in entrepreneurship and feelings of achievement [156]. Further, value co-creation also leads to a more enduring outcome of students' satisfaction. These findings depict that improving and sustaining a desirable level of value in entrepreneurship education requires a focus on the tangibility, reliability, responsiveness, assurance, and empathy dimensions of the curriculum and co-curricular activities, human capital, infrastructure, and access to funding and market components within the entrepreneurship education, which can imbue students' satisfaction [36]. However, this study demonstrated that entrepreneurial intention is strongly associated with having experience in co-creation [38], regardless of students' satisfaction with the education quality. It indicates that being satisfied with the quality of entrepreneurship education does not necessarily translate to a strong intention of owning a business. Since owning a business is a whole different experience from repurchasing goods or services. Goods or services are a relatively constant object; therefore, repurchasing goods or services provides customers with a way more predictable experience as they have experienced it before. However, engaging in entrepreneurship after graduation means the students involving themselves in activities that full of uncertainties, even more uncertain than what they have experienced in entrepreneurship education back then, since they are no longer backed-up by the school and have now become a fully independent entrepreneur. Furthermore, beyond an intention, owning a business is another next step that also requires other factors such as entrepreneurial competence [6].

Another captured insight was the overview of entrepreneurship education in vocational high schools from the students' perceived value, as presented in Table 2 (standard deviation, mean, and outer weights). The students agreed that the joint creation opportunity offered by the schools (0.595) and their active participation in it (0.487) are essential aspects to the realization of value co-creation in their schools [108]. The average VHS in West Java Province have accommodated joint creation with their students at an adequate level of 76.44%, although the students' participation itself still lagged slightly behind (70.66%). Furthermore, the students also agreed that the tangible (0.229), reliability (0.246), responsiveness (0.241), assurance (0.233), and empathy (0.215) aspects of the entrepreneurship education components in their schools, which include curriculum and co-curricular activities, human capital, infrastructure, and access to funding and market, are the important factors to provide a good quality of entrepreneurship education [53,80–85,99]. On average, the students perceived the most to the least quality aspects of entrepreneurship education in their schools as follows: empathy (87.26%), responsiveness (85%), assurance (83.6%), reliability (75.78%), and tangible (71.02%). The quality of tangible and reliability aspects appeared to have the lowest scores, which means that there is still unequal distribution of infrastructure, teacher and guest lecturer, and access to funding and marketing aids among the schools and regions, as shown by the loadings and standard deviation in Table 2. Besides being reliable measurements with a cut-off at 0.55 [150], however, the

red-colored loadings have a value below the 0.7 threshold due to a disparity in respondents' answers. Some perceived that the infrastructure, teacher and guest lecturer, and access to funding and marketing aids were available and supported their learning process in entrepreneurship, while the rest of them said those components were unavailable at their schools. It was further confirmed by the red-colored standard deviation, which indicated a significant gap between the upper and lower limits of respondents' answers—"strongly disagree/unavailable" (1) and "strongly agree/available" (5). This unequal distribution is due to the unequal regional development, which is a common problem in a developing country such as Indonesia [90,91]. In regard to the entrepreneurship education quality perceived by the students, it resulted in a level of students' satisfaction of 82.84% and entrepreneurial intention of 86.06%. Results of this field overview and the conceptual model were empirically aligned and thus, supported one another.

## 5. Conclusions and Limitations

### 5.1. Theoretical Contribution

Rooted in service marketing field, a number of research have revealed that value co-creation has a positive and significant effect on the perceived service quality, satisfaction, and behavioral intention of the customers [34–37]. When adopted into the entrepreneurial education context, this research added to the conceptual knowledge that a higher degree of students' value co-creation increases the quality of entrepreneurship education as well as the degree of students' entrepreneurial intention. Above all, the quality of entrepreneurship education is the strongest predictor of students' satisfaction. However, students' satisfaction can only be influenced by education quality and value co-creation, while the degree of students' satisfaction does not influence their entrepreneurial intention.

In accordance with real life, the students indeed perceive value co-creation and entrepreneurship education quality as important aspects. The average VHS in West Java Province has also embraced value co-creation within their entrepreneurship education at an adequate level, resulting in a good quality of entrepreneurship education in VHS—at least from the students' standpoint as the customers—and thus promoting students' intention in entrepreneurship. These positively contribute to the declining number of VHS graduates in the Open Unemployment Rate, as seen in Table 1 alongside the curriculum refinements over time, and a continuous progression of these efforts may lead to a greater result.

This research and other similar works by Bovill et al. [28], Floris & Pillitu [157], Hughes & Brooks [158], and Misiak-Kwit et al. [38], either in a quantitative or qualitative way, have revealed that, although S–D Logic and value co-creation theories are originated from service marketing field, they are also strongly relevant to the context of entrepreneurship education; encouraging the advancement of such research in this field.

### 5.2. Managerial Implication for the School and Government

From the managerial perspective, the applied entrepreneurship learning model—integrated PKK and SKD courses with the SPW program—is appropriate to the unique characteristics of VHS that emphasizes 30% theoretical and 70% practical learning [76]; therefore, it needs to be preserved. Complementary to the applied learning model, value co-creation is also a powerful learning approach for VHS, because it can enhance the entrepreneurship education's quality and students' entrepreneurial intention that, in the future, can create value not only for the students but also for the industry and society at large, because it has a strong ramification in sustaining VHS's competitive advantage and legitimizing their financial and social benefits, as they can foster entrepreneurial human capital that drives the economic growth of the country [36].

In addition, henceforth, the schools as the educators who interacting closely with the students have further homework to involve the students more in value co-creation process, specifically by encouraging student participation and joint creation. By accommodating the sounds of the students, it can help to increase the quality of the entrepreneurship education, since it can better match the needs of the students as the customers and, thus, promote

their intention in entrepreneurship. Although in a higher authority, the government as the policy maker also still has homework to do, which is to ensure the quality standardization of entrepreneurship education in every vocational high school (VHS), starting from the components that build the entrepreneurship education itself. For example, making sure that all VHS has the same access to: (1) sufficient infrastructure, (2) entrepreneurial and business management-skilled teachers and guest lecturers, (3) funding support, and (4) marketing support.

These findings are expected to be considered by the government and VHS to further involve the students in value co-creation, since it can enhance the quality of entrepreneurship education and thus, students' interest in becoming entrepreneurs. The results of this study are aligned and committed towards the SDG 4 and 8's initiatives to provide quality education in order to boost entrepreneurship for economic growth [4,159].

### 5.3. Limitation and Future Research Suggestions

After all, this study is not without any limitations. There is a long legacy of research on the entrepreneurial ecosystem that explains the impact of regional economic and social factors on the entrepreneurship process [160–165]. In this regard, the ecosystem of entrepreneurship education in regional schools is gaining importance, particularly in developing countries and developing regions of these countries [166]. Given that Indonesia is a developing country with unequal regional development [90,91], future research may consider examining region as a control variable in order to gain a comparative study and thus, a comprehensive view of the phenomena. Furthermore, this research stops at examining the entrepreneurial intention. Although intention has been widely used to measure entrepreneurship education effectiveness, but intention only serves as a bridge between ideas and actions [133]. Ashari et al. [55], from the view of the theory of planned behavior (TPB), suggested venture creation (actual behavior) as a more accurate measure of the effectiveness of an entrepreneurship education. Therefore, it is suggested for future research to extend the examination of value co-creation effect not only on entrepreneurial intention but also its implication on entrepreneurial competence and, even more, business performance.

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