

# Antecedents of Digital Entrepreneurial Intention

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**Abstract:** This study is interested in the role played by entrepreneurship education (EE) in the area of digital entrepreneurship. The researchers explored the relationships between the external enabler mechanisms (EEMs) in the digital environment and online collaborative learning (OCL), and their impact on entrepreneurial intention (EI). To test these relationships, the researchers developed an OCL program called *Digital Business Management*, which consisted of six modules on digital knowledge to be studied over 12 weeks. The participants in this study were students from two different batches of the program who studied in the same year in Thailand. The profiles of the students were a heterogeneous mixture of entrepreneurs and individuals in other careers. The data were collected at the end of the final class for each batch. We applied the quantitative method by using linear regression as the statistical method. The findings showed that OCL serves as a partial mediator between the EEMs in digital entrepreneurial intention (DEI). This finding supports the idea that EE is an important linkage between the external enablers and EI, and that OCL is an effective alternative method of delivering EE.

**Keywords:** Digital entrepreneurship, external enablers, entrepreneurship education, external enabler mechanisms, online collaborative learning, Thailand

## 1. Introduction

The role of entrepreneurship is to discover and exploit opportunities (Eckhardt & Shane, 2003). Moreover, entrepreneurs detect signals of changes in the economic environment and understand how to exploit those changes by turning them into business opportunities (Mason & Harvey, 2013; Shane, 2003; Stanworth & Curran, 1976).

The world today is full of changes arising from disruptive technology, and for entrepreneurs, the biggest wave of changes that brings along opportunities is driven by information communication technology (ICT) (Kostoff et al., 2004; Nagy et al., 2016). Over the past couple of decades, many new tech-driven ventures have been founded and successfully sustained their businesses (e.g., Apple, Facebook, Google, etc.). According to Statista (2021), the most valuable companies in the world's top 100 are mostly operating in the wider field of Information Technology. Both previous and current data shows that digital technology has played a vital part in creating business opportunities over the past two decades, and it seems like this situation will continue for the foreseeable future.

With so many success stories of digital ventures, it is not surprising that the startup world is also attracting entrepreneurs to jump in and ride the digital wave before it is too late. Recent data reveals that over 100 million new startups have been registered over the previous year (Rudden, 2021). In this environment, we view the phenomenon of the digital mechanism as an 'external enabler mechanism' (EEM) that drives economic activities to create entrepreneurial opportunities.

While the digital mechanism could be a strong driver for creating new entrepreneurial opportunities and entrepreneurs could create many new business ideas and exploit the digital waves, it is interesting to see how ready entrepreneurs are for the online world. Current studies show that many existing enterprises are not ready to either transform or adapt themselves to the online business world (Sebastian et al., 2020). According to Li et al. (2018), entrepreneurs with insufficient capabilities and limited resources have difficulties in driving the digital transformation in their enterprises.

According to UNESCO (2008), the role of entrepreneurship in education and training is made up of multiple kinds of experiences that give individuals the ability and vision of how to access and transform opportunities of different kinds and the ability to anticipate and respond to societal changes. Nevertheless, there is currently a very limited body of research that supports the role of *entrepreneurship education* (EE) in the area of digital entrepreneurship. One recent study shows the positive effects of MOOC (massive online open courses) resulting from the flexibility they afford entrepreneurs (Vorbach et al., 2019). However, entrepreneurship scholars are still far from reaching an agreement on the role of EE in the digital entrepreneurship context. Thus, while it seems that

there are plenty of opportunities out there in the digital world through the EEMs, the question remains whether EE supports entrepreneurs in the digital context.

### 1.1. Research Objectives

- (1) To explore the relationship between the EEMs and online learning pedagogy, and their impact on DEI.
- (2) To seek a better understanding of the phenomenon of digital entrepreneurship through the lens of EE.
- (3) From the use of an online questionnaire, an analysis will be performed on Thai Digital Business Management entrepreneurs opinions concerning factors related to DEI.

## 2. Literature Review

### 2.1. Digital Entrepreneurship (DE)

Digital Entrepreneurship (DE) has gained significant attention from entrepreneurship scholars over recent years (Bican & Brem, 2020; Sahut et al., 2019). This interest has arisen because of the proven evidence in the entrepreneurial world that many companies which have successfully utilized 'digitalization' in various applications have gone on to become billion-dollar companies in various industries, for example, Apple Inc. (computer industry), Google (information industry), Facebook (social media and social commerce) or Alibaba (e-commerce) and many more.

Steininger (2019) illustrates the evolution of DE, which has its roots in ICT-based entrepreneurship, and recently evolved into many advanced technologies, such as, Blockchain, artificial intelligence, augmented reality, cloud computing, etc. However, it is clear that '*digital technology*' alone does not create any business value. Entrepreneurs are the ones who create value by taking part in the entrepreneurial process of '*digitization*' either to create new products, new business models, or new services that benefit from the digital trend (Parviainen et al., 2017).

The conceptual definition of someone discovering an opportunity (new technology) and exploiting it is in line with the definition of entrepreneurship in the *Individual-Opportunity Nexus* view introduced by (Shane & Venkataraman, 2000), which explains the role of entrepreneurs as someone who discovers and exploits opportunities.

While the idea of someone exploiting new technology to create business value is not novel in entrepreneurship, digital entrepreneurship is still in vogue because it has created a huge wave of disruptive opportunity through the concept of '*digitization*'. Also according to Gartner (2020), digitization is concerned with the change process from analog to a digital form. Unlike many of the earlier technological changes, the digital world has created a prime opportunity for entrepreneurs to create new businesses and capture wealth from many leading industries, such as movies, books, and TV (Waldfoegel, 2017).

In the academic world, Zaheer et al. (2019) noted that DE has become an interdisciplinary field of study. To understand the sphere of DE, it is important to look at this domain from 3 scopes. These include (1) digital entrepreneurs, (2) the digital entrepreneurial process, and (3) the digital entrepreneurship ecosystem. In this study, we examine DEs as the unit of analysis.

### 2.2. The External Enabler and the Mechanism of Digital External Enablers

The concept of the '*external enabler*' was first introduced by Davidsson (2015) from which the idea was developed from the concept of 'exogenous shock', or big changes in the economic environment. Shane and Eckhardt (2003) also clearly illustrate that different types of changes in the economy give birth to different types of entrepreneurial opportunities.

The concept of exogenous changes affecting the birth of opportunities was first widely accepted through the concept of '*entrepreneurial opportunity*'. However, many entrepreneurship scholars argue that the term '*opportunity*' gives a sense of fragmentation to its study because it is unclear whether the term '*opportunity*' happens inside or outside of the entrepreneurial mind. Studies also show that the '*opportunity*' construct is still fragmented in both conceptual and operational definitions, which creates confusion and prevents entrepreneurship researchers from conducting the research that could advance the knowledge in this field with any degree of effectiveness (Hansen et al., 2011).

In response to developing the study of how exogenous change affects the birth of new ventures, Davidsson (2015) suggested three new constructs to represent an entrepreneurial opportunity. These were the external enabler, the new venture idea, and opportunity confidence.

From the view of Davidson (2015), an external enabler is similar to the concept of entrepreneurial opportunity in the ‘*Individual-Opportunity Nexus Theory*’. It is defined as the external circumstance that affects the supply and demand structure. It also supports the idea of previous studies that the external environment affects new ventures (Alvarez & Barney, 2013; Dimov, 2011; Shane, 2012). The idea of introducing the term ‘external enabler’ adds a new benefit to the study of entrepreneurial opportunity as it clearly distinguishes the objective opportunity (external enabler) from the subjective interpretation (new venture idea). Promsiri et al. (2018) conducted research to test the effects of different external enablers on the quantity and quality of business ideas, and determined that external enablers and new venture ideas are different constructs. External enablers exist in the environment and are observable, while business ideas or new ventures are a subjective interpretation.

In this study, we view “digital technology” as the external enabler. Digital technologies are “products or services that are either embodied in information and communication technologies or enabled by them” (Lyytinen et al., 2016, p. 49). Recent studies support the idea that the drive of digital technology stimulates the birth of new ventures (Chalmers et al., 2019; Davidsson et al., 2020).

### 2.3. Digital External Enabler Mechanisms (EEMs)

To give a deeper understanding and explanation of how an ‘*external enabler*’ works, von Briel et al. (2018) conducted a study of the ‘forces of the external enabler’, and how they empower the possibility for new venture ideas. The study detailed six EEMs including (1) *compression*, (2) *conservation*, (3) *expansion*, (4) *substitution*, (5) *combination*, and (6) *generation*. Therefore, different mechanisms explain different effects the enablers perform for a business and its resources. While there are six mechanisms, there are three types of effects that an enabler can perform. These include (1) *preserve*, (2) *modify*, and (3) *create*.

However, since there are some effects from each mechanism that have the same result, some digital EEMs can be combined. In summary, there are only three factors underneath the construct of the digital external enabler; these are (1) *compression & conservation* (C&C), (2) *expansion & substitution* (E&S), and (3) *combination & generation* (C&G).

**Table 1.** Mechanisms and their definitions.

Mechanism	Definition	Effect Category
Compression	Reduces the amount of time required to perform an action	Preserve
Conservation	Reduces the resources that are required to perform an action	Preserve
Expansion	Increases the ability of a resource.	Modify
Substitution	Replaces one resource with another.	Modify
Combination	Bundles different resources to create new artifacts, such as devices, functionalities, and business models.	Create
Generation	Creates new artifacts, such as devices, functionalities, and business models, by changing existing ones.	Create

Source: von Briel et al. (2018)

Therefore, we view digital technologies as enablers of venture creation for digital entrepreneurship.

### 2.4. Digital Entrepreneurial Intention (DEI)

Recent studies have adopted the concept of entrepreneurial intention (EI) in the digital context to define a new construct called ‘*digital entrepreneurial intention*’ (DEI). In Bayrakdaroğlu and Bayrakdaroğlu's (2017) ground breaking research the Internet’s interactive nature and that of entrepreneurship were combined into what the authors’ labelled as ‘*Internet Entrepreneurship*’, ‘*digital entrepreneurship*’, or ‘*IT-based entrepreneurship*’. Thus, all three terms are descriptions of how entrepreneurs can create opportunities through the use of digital media and other information and communication technologies (ICT). Also, research from Dutot and Van Horne (2015) led to the development of a DEI model. In their discussion, the authors suggest that DEI is influenced by an entrepreneur’s agility, alertness and characteristics.

Entrepreneurship study also frequently uses the concept of intention from a psychological field to give a better understanding of entrepreneurial behavior. In the body of entrepreneurship research, multiple studies still regard EIs as one of the critical antecedents of actual entrepreneurial actions (Krueger & Carsrud, 1993; Lee et al., 2011). This is consistent with the development of the well-known *Entrepreneurial Intention Model* which had its roots in the *Entrepreneurial Event Model* (Shapiro & Sokol, 1982) and the *Theory of Planned Behavior* (Ajzen, 1991).

Prior studies have also shown that EI has been widely used as the best predictor of creating new ventures (Ajzen, 1991), which is based on the premise that intention is the single best predictor of ultimate behavior (Ajzen, 1991). Also, EIs are usually defined as one's desire to own one's own business (Crant, 1996) or to start a business (Krueger et al., 2000). Generally, intentions have been used to describe a self-prediction to engage in a behavior (Ajzen, 1991; Ajzen & Fishbein, 1977). Therefore, once the formation of an EI occurs, actual entrepreneurial behavior can be predicted. Therefore, in this study we used EI intention as the dependent variable of the study as the predictor of entrepreneurial action in a new venture.

### **2.5. Entrepreneurship Education (EE) as the Bridge between External Enablers and Entrepreneurial Intention (EI)**

While numerous studies are supporting the idea that EE positively affects EI (e.g. Karimi et al., 2016; Peterman & Kennedy, 2003; Solesvik et al., 2014; Zhang et al., 2014), the outcomes and effectiveness of EE programs have remained largely untested (Pittaway & Cope, 2007; Von Graevenitz et al., 2010). However, according to Nabi et al. (2017), entrepreneurial scholars are increasingly showing the impact of EE in higher education, with EE now being used as possible antecedent to explain EI. It is also been suggested that EE positively affects student intention and attitude (Matlay, 2004; 2006), and increases the level of intention because of the knowledge it provides.

Previous studies have also shown that the acquisition of this new knowledge increases intention and actions (Dumitrescu et al., 2011), with Shane (2000) determining that prior knowledge was one of the antecedents of entrepreneurial opportunities. This is consistent with Ajzen et al. (2011) who revealed that knowledge is a prediction of behavior through the modification of the Theory of Planned Behavior (TPB), apart from attitude.

Further, our review of the literature suggests that similar studies were conducted at the 'program level', which results in the lack of a 'solid' theoretical explanation for how entrepreneurship education is connected to EI. However, Sirelkhatim and Gangi (2015) suggest that EE is one of the fastest-growing fields of education globally, yet the areas of '*what*' should be taught in these programs and '*how*' it should be taught, have been observed by many researchers as lacking consensus and requiring more attention. Therefore, in this study, we are interested in developing suitable digital EE at the pedagogical level that can help to improve the digital EEMs and DEI.

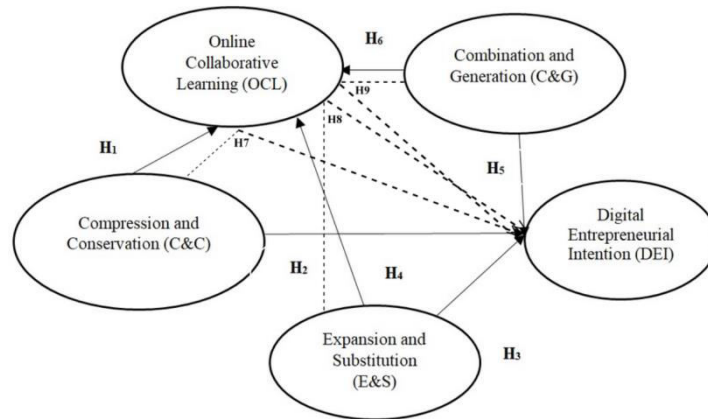
### **2.6. Online Collaborative Learning (OCL) Method as Teaching Pedagogy**

Since this study is interested in developing a suitable entrepreneurship teaching pedagogy, we propose that OCL could serve as an effective mediator between the EEMs and DEI. First, in the context of adult learners, like entrepreneurs, flexibility and time are essentially important. While a physical class could provide more interaction, the online format offers learners greater flexibility. Second, OCL provides a platform that enables learners to practice and engage with digital experiential learning through various applications and teaching methods, with Dhliwayo (2008) in South Africa showing that experiential learning can have a strong impact on entrepreneurship education. Third, the online collaboration method is built from constructivism (Piaget, 1964) and sociocultural approaches (Vygotsky, 1978), which indicates that learners can be more interactive and successful as a group than when working alone. This is different from the MOOC approach which has less engagement because of the pre-recording or video format.

According to the justifications mentioned above, we propose that the online collaboration method serves as a mediator to help individuals improve their knowledge regarding the EEMs, which mediate the impact of EI. The researchers believe that obtaining information about the impact of digital mechanisms is not enough for individuals. The digital mechanisms could be exploited to enable proper knowledge processing about those enablers. Accurate knowledge with a suitable teaching pedagogy could improve students' cognitive ability about the digital world, which directly affects the intention to start new ventures. Therefore, we propose the framework for this study in Figure 1, along with the model's nine hypotheses.

### **2.7. Conceptual Model and Hypotheses Statements**

We present the conceptual model in Figure 1 and nine hypotheses statements for the study:

**Figure 1.** The study's conceptual model.

### Hypotheses

Hypothesis H<sub>1</sub>: Compression and Conservation (C&C) will be positively and significantly related to Online Collaborative Learning (OCL)

Hypothesis H<sub>2</sub>: Compression and Conservation (C&C) will be positively and significantly related to Digital Entrepreneurial Intention (DEI)

Hypothesis H<sub>3</sub>: Expansion and Substitution (E&S) will be positively and significantly related to Digital Entrepreneurial Intention (DEI)

Hypothesis H<sub>4</sub>: Expansion and Substitution (E&S) will be positively and significantly related to Online Collaborative Learning (OCL)

Hypothesis H<sub>5</sub>: Combination and Generation (C&G) will be positively and significantly related to Digital Entrepreneurial Intention (DEI)

Hypothesis H<sub>6</sub>: Combination and Generation (C&G) will be positively and significantly related to Online Collaborative Learning (OCL)

Hypothesis H<sub>7</sub>: Online collaborative learning (OCL) will mediate the relationship between Compression & Conservation (C&C) and Digital Entrepreneurial Intention (DEI)

Hypothesis H<sub>8</sub>: Online collaborative learning (OCL) will mediate the relationship between Expansion and Substitution (E&S) and Digital Entrepreneurial Intention (DEI)

Hypothesis H<sub>9</sub>: Online collaborative learning (OCL) will mediate the relationship between Combination and Generation (C&G) and Digital Entrepreneurial Intention (DEI)

### 3. Methods

The researchers first developed an OCL method in the form of a certificate program called "*Mini MBA - Digital Business Management*". The program was a part of our university's public program which is open for anybody interested and not limited to MBA students. The program consists of 6 modules aimed at providing overarching knowledge about digital business. Each module has 2 sessions every week, and the course lasts for 12 weeks in total as shown in figure 2.

The OCL program was used for this study which was conducted via the ZOOM application together with the use of Google Classroom. The Zoom application serves as the main platform for a live class which allows learners to participate in real-time, while Google Classroom serves as the back office for learners to explore learning support documents and recorded video links.

**Figure 2.** Six modules for Digital Business Management entrepreneurs

Source: Authors' university program.

The program was designed to provide different types of online teaching experiences, including lecturing, a break-out group working, voting, and online seminars. The learners participated and were engaged throughout the program of 12 weeks. A questionnaire was distributed at the end of Week 12 after the completion of the course. Data collection was drawn from two batches of the same program in the year 2020. In total, 160 participants replied to the online questionnaire.

#### 4. Findings

The participants in the study were a mixture of entrepreneurs, employees, and freelancers, which displayed excellent characteristics of heterogeneity. The researchers collected the data via an online survey and analyzed the results through statistical software.

The average age of the respondents was 39.13 years old, with 52% being female. Also, a majority (57%) had acquired an undergraduate degree, while another 42% had finished a graduate degree. Finally, the largest group in the study identified themselves as a private sector employee (55%), while the second largest group identified themselves as an entrepreneur or self-employed (29%).

**Table 2.** The demographic data ( $n=160$ )

	Mean	S. D.	Number	Percent
<b>Age</b>	39.13	8.783		
<b>Gender</b>				
Male			77	48%
Female			83	52%
<b>Educational Level</b>				
Below Bachelor's degree			2	1%
Bachelor's degree			91	57%
Master's degree			62	39%
Doctorate degree			5	3%
<b>Occupation</b>				
Private sector employee			88	55%
Government officer			10	6%
Entrepreneur or self-employed			46	29%
Freelancer			7	4%
Retired			2	1%
Unemployed			5	3%
Other			2	1%

S.D. = standard deviation.

The objective of this study was to understand the mediating effect of OCL between the EEMs and DEI. All variables were graded by 160 participants on a Likert type agreement scale, ranging from 1 'strongly disagree' to 5 'strongly agree'.

Pearson's correlation coefficient was computed for the study variables to measure the relationships between all variables. The mediating effect of the relationships among the variables was tested by a linear regression method, the one-tailed test of significance. The linear regression was tested between the EEMs and DEI and also between the EEMs and OCL.

The mediating effect was suggested as a 3-step procedure by Barron and Kenny (1986). These steps were: (1) testing the regression between the mediator and the independent variables, (2) testing the regression between the dependent variable and the independent variables, and (3) testing the regression both between the dependent variable and independent variables and also between the dependent variable and the mediator variables. However, to complete the mediation testing, it is necessary to apply a formal test of significance of mediation through the Sobel test (MacKinnon et al., 1982; Sobel, 1982).

The correlation analysis indicated that the independent variable was strongly correlated with the mediator variable (KeSu& Lim, 2021). Moreover, the dependent variable had slightly strong correlations with the independent variables, and the dependent variable was strongly correlated with the mediator variable. Table 3 presents the correlation coefficients for the study's variables.

**Table 3.** Descriptive statistics and correlation among variables.

Variables	Mean	S.D.	C&C	E&S	C&G	OCL	DEI
Compression & Conservation (C&C)	4.60	0.44	<b>1.00</b>				
Expansion & Substitution (E&S)	4.62	0.45	0.856**	<b>1.00</b>			
Combination & Generation (C&G)	4.63	0.44	0.728**	0.700**	<b>1.00</b>		
Online Collaborative Learning (OCL)	4.42	0.46	0.498**	0.505**	0.525**	<b>1.00</b>	
Digital Entrepreneurial Intention (DEI)	4.39	0.79	0.15	0.257*	0.292*	0.385**	<b>1.00</b>

\*Correlation is significant at the 0.05 level (2-tailed). \*\* Correlation is significant at the 0.01 level (2-tailed).

A linear regression technique, the one-tailed test of significance, was used in the analyses to investigate the mediating effects of the relationships between the EEMs and the dependent variable. Table 4 and Table 5 summarize the findings from the analysis.

**Table 4.** Results of Linear Regression analysis

	Regressing EEM on DEI			Regressing EEM on OCL		
	R <sup>2</sup>	$\beta$	<i>p</i>	R <sup>2</sup>	$\beta$	<i>p</i>
Compression and Conservation (C&C)	0.022	0.830	0.228	0.248	0.476***	0.000
Expansion and Substitution (E&S)	0.066	0.146*	0.035	0.255	0.493***	0.000
Combination and Generation (C&G)	0.085	0.164*	0.016	0.276	0.505***	0.000
Online Collaborative Learning (OCL)	0.149	0.224**	0.001			

\* Correlation is significant at the 0.05 level (one-tailed). \*\* Correlation is significant at the 0.01 level (one-tailed). \*\*\* Correlation is significant at the 0.001 level (one-tailed).

**Table 5.** Summary of regression analysis predicting OCL's mediating role in the relationship between DEI and the EEMs.

Variables	<i>z</i>	<i>p</i>
Compression and Conservation (C&C)	2.708**	0.003
Expansion and Substitution (E&S)	2.73**	0.003
Combination and Generation (C&G)	2.77**	0.002

\*\* Correlation is significant at the 0.01 level (one-tailed).

Results from the linear regression analysis showed that H<sub>2</sub>, H<sub>3</sub>, and H<sub>5</sub> relationship to DEI was significantly related with E&S ( $\beta = 0.146$ ,  $p = 0.035$ ), C&G ( $\beta = 0.164$ ,  $p = 0.016$ ) independent variables of the EEMs, which supports Hypotheses H<sub>3</sub> and H<sub>5</sub>. However, C&C ( $\beta = 0.83$ ,  $p = 0.228$ ) did not reach a significant level ( $p < 0.01$ ), which means that Hypothesis H<sub>2</sub> is not supported (Table 4).

However, Hypotheses H<sub>1</sub>, H<sub>4</sub> and H<sub>6</sub> suggest that the independent variables of the EEMs will be positively related to the mediator variables of OCL. The regression model of Hypotheses H<sub>1</sub>, H<sub>4</sub> and H<sub>6</sub> were explained at 24.8%, 25.5%, and 27.6% respectively (Table 4).

As expected, C&C ( $\beta = 0.476$ ,  $p = 0.000$ ), E&S ( $\beta = 0.493$ ,  $p = 0.000$ ), and C&G ( $\beta = 0.505$ ,  $p = 0.000$ ) all reached a significant level ( $p < 0.01$ ). The regression coefficient is as expected positive, supporting H<sub>1</sub>, H<sub>4</sub>, and H<sub>6</sub> as shown in Table 4.

The 3-step mediating effect was applied for testing H<sub>7</sub> which proposed that OCL mediated the relationship between the EEMs and DEI. In step 1, the DEI was regressed for C&C, followed by step 2 in which C&C was controlled and OCL was introduced. Then, the calculations were made with Sobel's test (Preacher & Leonardelli, 2001). The identical procedure was duplicated for testing the mediating role of OCL between E&S and C&G, referring to H<sub>8</sub>, and H<sub>9</sub>.

The regression coefficient for OCL was significant in contributing to DEI when C&C was controlled, indicating the mediating role of OCL. The Sobel test revealed significant evidence that OCL partially *mediates* the relationship between DEI and C&C ( $z = 2.708, p = 0.003$ ). The significant regression coefficient for OCL showed that it contributed to DEI when E&S was controlled; this indicates the mediating role of OCL. The results of the Sobel test revealed significant evidence that OCL partially *mediates* the relationship between DEI and E&S ( $z = 2.73, p = 0.003$ ). OCL was also significantly related to DEI when C&G was controlled, indicating the mediating role of OCL. The results of the Sobel test also revealed significant evidence that OCL partially mediates the relationship between DEI and C&G ( $z = 2.77, p = 0.002$ ). These results support H7, H8, and H9 as shown in Table 6.

**Table 6.** Hypotheses testing results.

Hypotheses	Results
H <sub>1</sub> : Compression and Conservation (C&C) will be positively and significantly related to Online Collaborative Learning (OCL)	Supported
H <sub>2</sub> : Compression and Conservation (C&C) will be positively and significantly related to Digital Entrepreneurial Intention (DEI)	Rejected
H <sub>3</sub> : Expansion and Substitution (E&S) will be positively and significantly related to Digital Entrepreneurial Intention (DEI)	Supported
H <sub>4</sub> : Expansion and Substitution (E&S) will be positively and significantly related to Online Collaborative Learning (OCL)	Supported
H <sub>5</sub> : Combination and Generation (C&G) will be positively and significantly related to Digital Entrepreneurial Intention (DEI)	Supported
H <sub>6</sub> : Combination and Generation (C&G) will be positively and significantly related to Online Collaborative Learning (OCL)	Supported
H <sub>7</sub> : Online collaborative learning (OCL) will <i>mediate</i> the relationship between Compression & Conservation (C&C) and Digital Entrepreneurial Intention (DEI)	Supported
H <sub>8</sub> : Online collaborative learning (OCL) will <i>mediate</i> the relationship between Expansion and Substitution (E&S) and Digital Entrepreneurial Intention (DEI)	Supported
H <sub>9</sub> : Online collaborative learning (OCL) will <i>mediate</i> the relationship between Combination and Generation (C&G) and Digital Entrepreneurial Intention (DEI)	Supported

## 5. Discussion

From the data analysis, the results showed that OCL serves as a partial mediator between the EEMs and DEI. Although the EEMs alone positively affect DEI, the data also shows that the mediating effect is stronger through OCL. This finding is in line with our theoretical explanation that OCL gives learners a proper entrepreneurship pedagogy that increases their entrepreneurial knowledge. Even though the overall direct effect from the EEMs to DEI is effective, not all components of the mechanisms were significant in this respect. The results also show that C&C alone has no direct effect on DEI. This is also in line with the theoretical explanation that the existence of technology alone does not directly affect the intention, and that proper cognitive processing plays a vital role in making effective use of the existence enabler.

Furthermore, our findings support the idea that EE is an important driver of external enablers. This is also consistent with research from Korea on EE in which KeSu and Lim (2021) found the significant importance of EE on job value and self-efficacy. Also importantly, the right entrepreneurial pedagogy, like the OCL tested in this study, serves as a strong mediator to help individuals gain better entrepreneurship knowledge, which positively affects the EI to start a business venture. Future research should further explore the relationships between different entrepreneurship teaching pedagogies and different external enablers, and their effects on EI.

## 5. Conclusion

Pearson's correlation coefficient was computed for the study variables to measure the relationships between all variables. The mediating effect of the relationships among the variables was tested by a linear regression method, the one-tailed test of significance. The linear regression was tested between the EEMs and DEI and also between the EEMs and OCL.

This study also made a contribution to scholars of entrepreneurship in the area of EE, particularly in the contextual study of digital entrepreneurship. The findings show that OCL could be an alternative teaching pedagogy for entrepreneurship through its nature of being flexible in physical space, its high interaction, and its ability to share information in real-time.



These findings are beneficial for both learners and instructional designers. For learners as users, they could consider taking courses through OCL as an alternative choice. This learning format could offer a greater choice for adult learners and entrepreneurs who find challenges in committing time to study a physical class. For the instructional designers, it is suggested that they could seriously consider developing an OCL course that includes a mixture of online experiences, such as online seminars, online voting, live group work, lecturing, and class discussions.

Additionally, multi-online teaching collaboration improves the way learners acquire the content. Also, using a multi-platform for different learning purposes is highly recommended as a way of increasing efficiency because different applications serve different functions. For example, the instruction designer could use one application for live online teaching sessions, while they can use another application for after-class services and class management as well. Lastly, the development of great content that is relevant to the context and current trend, such as digital entrepreneurship, is highly recommended for attracting the attention of entrepreneurs who want to study topics that are practical and just-in-time for their daily usage.

## 5. Future Research Direction

The understanding of the relationship between entrepreneurship education and external enablers has just begun. We understand that the right education will increase the acquisition of knowledge that positively affects the transformation of external enablers into new ventures. However, the quest to understand this relationship has just started. There are many opportunities for further research to fill in the gaps. From the theoretical perspectives, future research could seek to find an alternative theory that could help mediate between external enablers and their dependent variables, such as entrepreneurial intention and entrepreneurial ideas. Entrepreneurship scholars need to increase their understanding of the theoretical explanations that drive the external enablers. From the research design perspective, further research could be focused on designing different types of research designs to facilitate better understanding. Qualitative studies about the effectiveness of online collaboration would be very beneficial for increasing the understanding of the learners' preferences. Alternately, an experimental design to test the different types of external enablers and their effects would add interesting new information to this field as well.

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