



## Kolb's Experiential Learning: An Empirical Test by Science Field on Student Innovativeness in Creating Startups Business in Indonesia

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### ABSTRACT

**Purpose:** The increasing amount of unemployment of university graduates has set off an increase in entrepreneurship studies. Unfortunately, student entrepreneurship has been neglected in bringing out the innovativeness of creating startups business, including less attention to students' fields of science. To fill this gap, the application of experiential learning (EL) model is an alternative. This study aimed to determine the effectiveness of Kolb's EL model and field of study groups on student innovativeness in creating startups business at universities in Indonesia. **Methodology:** A quantitative approach of quasi-experimental type was used in this study, with a 2 x 2 factorial design. The research sample comprised active students who were enrolled in entrepreneurship courses, identified through *stratified random sampling*. A project-based assessment tool was used as the research instrument, based on indicators of innovativeness in creating start-ups business which met validity and reliability. All data were analyzed statistically, namely *descriptive statistics* and *comparative analysis*.

**Findings:** The results showed that there was some effect of Kolb's EL model on student innovativeness and its interaction with the student's field of study group on student innovativeness. **Implications for Research and Practice:** This study illustrates that the EL aspect has a strong theoretical framework for entrepreneurship learning, therefore, it needs to expand through further studies.

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## Introduction

Globalization has demanded innovation to address all kinds of issues related to improving educational and entrepreneurial competence among students, vis-à-vis market changes or exploitative working conditions. Innovativeness is the power that introduces students to new products, services, business models or develop creative fashion. One of basic characteristics required to be an entrepreneur or aspiring entrepreneur is having innovativeness (Rauch et al., 2009; Zimmerer, Lambin, & Vanek, 2018). Innovativeness is a driver of a company's sustainability, market power, and at the same time is considered an instrument by which entrepreneurs create new products/services and enhance the current products (Antonietti & Gambarotto, 2020). Innovation is seen in the popular products or services (Nirwan & Dhewanto, 2015). The results of the study by Hanaysha et al. (2022) state that innovation of products and services has a significant positive impact on business sustainability, and influence to predict competitive strategies. Moreover, business ventures should have a touch of innovation to compete and survive, not just repeating what is currently viral (Palinggi et al., 2021).

However, the innovativeness of students in creating startups business is not getting enough attention, whereas the general spectrum of entrepreneurial values such as innovativeness, risk management, and tolerance of ambiguity are the main drivers of entrepreneurial dynamics (van der Westhuizen & Goyayi, 2020). The problem is that students lack confidence of their idea of the product they want to create and put less time to identify entrepreneurial opportunities (Nwankwo & Kanyangale, 2020) and they tend to imitate rather than innovate (Haftor & Costa, 2023). This is also emphasized by the results of the study by Al-Mamary and Alshallaqi (2022) that only a few graduates have the desire to start a business or innovate a business. In addition, most students prefer to have a paid job rather than being self-employed (Atiyah, 2021). In entrepreneurship courses, the students' products lack a touch of innovation, and are not embracing the regional economic excellence. On the other hand, the labor market is unable to absorb a large number of graduates, thus paving the way for unemployment of university graduates. In Indonesia, unemployment number reaches above 1 million people (BPS, 2022). This data shows that university graduates have not been able to be independent and make innovation so that university graduates will find it increasingly difficult to compete in today's society.

Based on the above problems and demands, entrepreneurial experience is needed to encourage student innovativeness, as a constructive alternative. Kolb's *Experiential Learning* (EL) has been considered as an effective model to stimulate students in creating *entrepreneurial opportunities* in universities (Taneja, Goyal, & Malik, 2023). This is because EL has a cycle that focuses on learners' actions and choices in building cognitive structures through engagement with experience and reflection, conceptualization, and experimentation (Ely, 2018); focusing its teaching as a method by practicing entrepreneurship through start-up activities including technology-based promotion (Motta & Galina, 2023). EL provides the possibility for learners to develop business plans and create awareness of business opportunities (Bell & Ruhanen, 2016). Furthermore, according to Lackéus and Sävetun (2019) that the EL model provides space for the birth of entrepreneurial thinking students, and empirically able to exist in business. Empirical evidence also shows EL has a positive impact on entrepreneurial intentions, skill development, and entrepreneurial competencies (Motta & Galina, 2023); self-reflection

ability including critical thinking (Cheng, 2020); improving learners' soft skills in entrepreneurship (Bradberry & De Maio, 2019). Many studies have confirmed the effectiveness of EL in business education so it is highly recommended to implement EL in non-business education as emphasized by Taras et al. (2013). These empirical arguments and evidence provide a strong framework for the quality of learning using EL.

To achieve the goal which is student innovativeness, it is definitely not enough to use the EL learning model only. The most important thing is to build the supportive ecosystem through the *entrepreneurial university* environment (Etzkowitz & Zhou, 2008; Schulte, 2004). According to Wegner et al. (2020) *entrepreneurial university* environment has stimulated *entrepreneurial* intentions, increased students' willingness to start new ventures or businesses, and proactive about market opportunities. Empirical evidence found that students consider university support to be an important instrument for new business intention through business environment that is conducive to lead innovation (Saeed et al., 2015). University roles are no longer just producing and disseminating knowledge, but also stimulating entrepreneurial behavior and encouraging the growth of new businesses (Bergmann, Hundt, & Sternberg, 2016). According to Lazzeroni and Piccaluga (2003), one of the characteristics of an entrepreneurial university is to provide the competitive advantages of the regional economy and the development of business ventures based on the internal strengths of the university. These characteristics can be applied by having a cooperation with local industries and commanding the potential of the local economy. It provides space to generate innovativeness and creativity in creating businesses (Boni, Gross, Gunn, & Levine, 2021). One embodiment of the strengthening of entrepreneurial universities takes the form of the strengthening of entrepreneurial learning in entrepreneurship courses. Quality entrepreneurship education has been proven to be effective in strengthening entrepreneurial interests and intentions (Pittaway & Cope, 2007); attitudes towards entrepreneurship (Pihie & Bagheri, 2010); and the intention to start entrepreneurship/business (Sánchez et al., 2011), as well as in accelerating the creation of business start-ups (Menzies & Paradi, 2002). Entrepreneurship education has made a very positive contribution in producing graduates who engage in entrepreneurship, especially in the way they think and act (Kirby & Ibrahim, 2011).

Therefore, this research was conducted in order to confirm the effectiveness of Kolb's EL in entrepreneurship education, focusing on the essence of student innovativeness in creating entrepreneurial opportunities (business start-ups), with business products based on regional economic competitive advantages at the level of universities in Indonesia. The focus is on universities, because universities in Indonesia have heterogeneous scientific fields, including the characteristics of student entrepreneurship. In addition, universities in Indonesia have a difference of quality levels based on accreditation status, although it is hard to find difference in EL quality between superior and good accreditation universities. Hence, for both universities with good or less accreditation status, it is very important for students to be innovative in creating *entrepreneurial opportunities (startup businesses)*. Because the character of innovativeness in entrepreneurship according to Rauch et al. (2009) always focuses on efforts to create new products, new mechanisms in producing products, finding and creating new markets, and others.

The novelty of this research is the strengthening of student innovativeness in creating startups business based on the novelty of EL Kolb's theory in the Indonesian context. On the other hand, this study involves the variable of accreditation status of universities and

the variable of science field group as variables that are taken into account in the analysis. Thus, the purpose of this study is to analyze the effectiveness of the EL model on student innovativeness in creating startups business with science field as a moderator variable. The characteristics of students from each science field can contribute to maximizing the opportunities available as a provision for creating a business.

## Theoretical Overview and Hypothesis Development

### *Overview of Student Innovativeness in Creating Businesses*

Increasing the competitiveness of universities graduates in Indonesia requires student innovativeness in creating startups business. A number of theoretical arguments suggest a positive relationship between innovativeness and company survival (Ameh & Udu, 2016). Innovativeness is a special funnel for an entrepreneur to use transformation as an opportunity (Drucker, 2012). For commercial activities, it can indicate the implementation of new ideas, the creation of dynamic products, or the improvement of existing services with a technological touch (Haftor & Costa, 2023). Moreover, in an economic context, innovativeness is fragmented based on the perspectives of companies and consumers (Danneels & Kleinschmidt, 2001). In terms of consumer perspective, it can be seen by how much the company's innovation achieves, depending on innovation signals, risks, and behavioral changes when using these innovations (Shafira & Johan, 2022). Meanwhile, from the perspective of the company according to McNally, Cavusgil, and Calantone (2010) that innovativeness is divided into two dimensions, namely new technological discontinuity for adjusting the existence of the new technology and market discontinuity for manifesting new marketing activities with new categories of competitors, products, consumers, distribution channels and unfamiliar things to the company.

Technological power in market will affect marketing operations so that learners must be aware about it (Kumar et al., 2021). Innovativeness is closely related to creativity and innovation (Antonietti & Gambarotto, 2020). Innovation supported by digital solutions has become a silent hero for many companies (Wasilczuk & Stankiewicz, 2022). The study of Wathanakom, Khlaisang, and Songkram (2020) found that the indicators of the process of searching for new technologies, techniques, or product ideas are very significant to the factors that form innovativeness. Creativity and innovation are considered key success factors in the entrepreneurial process (Danish et al., 2019).

Creating a business usually comes with innovating technological trends. Technological innovation has become a major concern for entrepreneurs who want to increase the value of their products/services, go through new markets, and expand business and profits (Chege, Wang, & Suntu, 2020). It is clear that technological mode innovation is understood as an approach that gives company a competitive advantage through market diversification and new commercial opportunities (Pateli & Giaglis, 2005). This interest seems has several interacting forces, which are strong adoption of digital technologies, deregulation of various industries and harmonization of market regulations in which it can bring buyers and sellers together through technology (Climent & Haftor, 2021). The transformation from conventional to e-market creates opportunities for the younger generation including students. Developing a technology-based business can theoretically increase benefits, efficiency, promotion, branding position, and new opportunities (Melović et al., 2020). Based on this theoretical framework, the innovativeness of students

referred to in this study is the innovativeness of students in creating businesses, especially producing new business products/services with digital-based marketing.

### *Overview of Experiential Learning*

Creating startups business in universities requires supporting factors, such as the implementation of enjoyable entrepreneurship courses for students; effective interaction between universities, industry and government; entrepreneurial role models, and technological support (Klofsten et al., 2019). Therefore, the implementation of experiential learning is an ideal way to connect these factors. Implementing EL in-entrepreneurship learning plays a role in the growth of an entrepreneurial mindset with adaptation to changing times (Martín-de Castro et al., 2013). It is consistent with previous studies (Gittings, Taplin, & Kerr, 2020; Kolb & Kolb, 2005) that EL promotes higher-level learning, such as critical thinking, self-directed, meaningful learning and better knowledge retention. This is because the learning environment is brought closer to real life.

Kolb et al. (1986) EL model has four cyclical stages that interact with each other: (1) concrete experience, which is direct experience or activity in understanding concrete reality; (2) reflective observation, where students reflect based on these experiences; (3) abstract conceptualization, where students construct or build knowledge and design experiments; and (4) active experimentation, where students conduct direct business tests. The assumption is that the greater the student involvement, the deeper the learning (Ferguson et al., 2017; Kolb et al., 1986). According to Rauch et al. (2009), the components in the EL model aim to develop students' entrepreneurial practices in universities and to develop competencies in designing a business, new business and modifying old products with various trends.

This perception makes it clear that EL Kolb provides a framework to strengthen learners to become future entrepreneurs. Despite its relevance, previous studies have not included many measurements on the innovative aspect of learners, in which innovativeness is the main outcome of learning entrepreneurship/business (Schaller & Zimmerer, 2008). In addition, Coleman (2000) suggests the significance of paying attention to the varied characteristics of students and the scientific field they are engaged in. The study of Sukri et al. (2023) found how important these variables are, because they will affect the quality of learning implementation.

As explained above, the innovativeness of students in creating startups business (entrepreneurial products or services) can be approached through the implementation of Kolb's EL, because EL provides space for students to be entrepreneurial. However, the innovativeness of each individual can be different depending on their entrepreneurial characteristics, interests and fields of study. On that basis, the hypothesis in this study, namely:

**H1:** *There is an effect of the EL Kolb model on student innovativeness in creating startups business (entrepreneurial products/services).*

**H2:** *There is an effect of students' science field on students' innovativeness in creating entrepreneurial product/service startups business).*

**H3:** *There is an interaction effect of the EL model with the science field on student innovativeness in creating entrepreneurial product/service startups business).*

## Method

- *Research Design*

This research approach is a quantitative with quasi experiment with a  $2 \times 2$  factorial design (Asy'ary & Jais, 2021). In this design, it involves moderator variables that affect the treatment of the results, namely students' science field (Social and Humanities and Science and Technology). An overview of the design is presented in Table 1.

**Table 1**

*2 x2 Factorial Design.*

Science Field	Learning Model	
	Experiential Learning (EL) Model	Conventional Model
Social and Humanities (SH)	EL SH	Conventional SH
Science and Technology (ST)	EL ST	Conventional ST

The experimental group was assigned using the *EL* Kolb model, while the control group was not intervened. Both the experimental and the control group were randomly selected from the population after the classes have been commensured. Here, it is made sure that the classes took the same entrepreneurship courses, possessed almost the same abilities, had relatively the same learning hours, and included almost the same number of students. In each treatment group, there were students from the Social Sciences and Science groups. Furthermore, the experimental procedure is presented in Table 2.

**Table 2**

*Research Procedure.*

Q1	X1	Y1	Q2
Q3	X1	Y2	O4
Q5	X2	Y1	O6
Q7	X2	Y2	O8

Description:

Q1, 3, 5, 7 : observation of *pretest* results

Q2, 4, 6, 8 : observation of *posttest* results

X1 : *experiential learning* model

X2 : conventional model

Y1 : Social and Humanities

Y2 : Science and Technology

The experiment was conducted through the following steps: Step1: preparing a semester learning implementation plan (RPS) which incorporates the EL model into the entrepreneurship course's learning; Step2: preparing instruments for student innovativeness in producing business start-ups; Step 3: determining the experimental and the control class using stratified random sampling after class commensuration; Step 4: conducting simulations with the lecturers; Step 5: providing treatment using the EL model, based on the semester learning implementation plan (conducted by each lecturer); Step 6: assessing student innovativeness; and Step 7: analyzing research data.

- *Research Sample*

The research population was active students at universities in Indonesia. For the trial test, a sample of several students at 3 (three) universities was taken by *stratified random sampling*. *Stratified* means taking students based on the accreditation status of the universities (excellent and good, in addition to considering the region (western, central, and eastern Indonesia). With this procedure, Tanjung Pura University of West Kalimantan Province (good accreditation and western region), Sanata Dharma University of Yogyakarta (Excellent Accreditation and central part), and Mataram University (good accreditation and eastern region) were taken. From each university, 2 (two) classes for Social and Humanities field and 2 (two) classes in the Science and Technology field were taken randomly. All the classes were currently enrolling entrepreneurship courses. In this study, there were 123 students in the experimental group and 119 in the control group.

- *Research Instruments*

The innovativeness of students in creating startups business (entrepreneurial products/services) refers to the results of McNally et al. (2010) study, including student innovativeness in producing new products/services and technology/digital-based marketing. The data collection instrument uses a project-based assessment sheet, which consists of 4 (four) main elements (Bergh, Perry, & Hanke, 2006), namely planning, project implementation, project results/products, and reporting. The assessment instrument has an assessment rubric; good category (score 3), sufficient (score 2), and poor category (score 1). The validity of the instrument was carried out through expert testing, while the reliability test used the correlation test of the assessment results by 2 (two) assessors as suggested by Daryono, Rayanto, and Damayanti (2023).

- *Data Analysis Technique*

All research data were analyzed quantitatively, through comparative analysis tests using ANOVA analysis techniques. Duncan post hoc test analysis was also applied to determine which groups had differences. Prior to the statistical test, data normality test was conducted using Kolmogorov-Smirnov test and homogeneity test using Levene between groups. However, if it does not meet the requirements of normality and homogeneity, then non-parametric analysis is used. The whole analysis used the help of the SPSS program version 23.00 for windows.

## Results

The study results begin with a description of student innovativeness in creating startups business and continues with a description of the trial results. This description contains the innovativeness of students in creating startups business (entrepreneurial products and or services) through *Entrepreneurial Opportunity*. Table 3 presents details about seven samples from student groups in the experimental class using EL.

**Table 3***Products of Student Entrepreneurial Innovation Results.*

No.	Owner	Products	Output	Impact	Description
1.	Group 1	Maskkber	Products	Improve skills and enhance experience.	Start developing the market.
2.	Group 2	Strudelicious	Products	Improving skills and market development	Serving consumers through the offline market by dropping off at cafes, products are available
3.	Group 3	HAFAL Room	Services	Enhance experience.	Start developing the market.
4.	Group 4	Super Cheewe	Products	Improving skills, and market development.	Start developing the market
5.	Group 5	Gelor Chips	Products	Improve skills, profits and markets.	Serve customers directly and the products are available
6.	Group 6	Awur Awur Mplok	Products	Improve skills and enhance experience.	Start to develop the market, serve consumers directly, products are available.
7.	Group 7	Hilo Cheese Roll	Products	Improve skills, develop markets and provide experience.	Start developing the market, products are available, serving consumers directly.

- *Student Innovativeness Exposure (Products)*

1. *Maskkber*

This product is a face mask inspired by the local vegetable in Lombok, Moringa leaves. Maskkber stands for Rice Moringa Mask. Moringa leaves have many benefits, like facing acne problems caused by germs, reducing skin inflammation from the effects of acne. The branding of the mask product is organic mask that use of natural ingredients. This product is popular among the younger generation because of the slogans of free parabens, animal test free, and alcohol free like big mask companies echoed. The Maskkber group started their business with a wide range market because the combination of moringa leaves and rice has lack exposure for skincare products. To compete with other mask products, they put big concern on packaging and design of the product. In addition, for the marketing platform, they sell their product not only in conventional way or offline, but also in e-commerce.

2. *Strudelicious*

This product is basically from puff pastry, which has various fillings, such as: bananas, strawberries, raspberries, blueberries, apples, raisins, nuts, spices such as cinnamon, chocolate, cheese, sausage, peppers and others. The customers can choose what filling they want (personal preference). The *strudel* introduced by Studerlicious is long and threaded, similar to a cake roll. Several innovations have been made, namely variations in flavor and shape of the strudel. Many strudel enthusiasts are from children, teenagers to mothers. In addition, clear and attractive marketing is the commitment of this business group in reaching the interest of consumers. This student group sees a good range market, because *strudel* is still a popular food that does not have so many competitors.



### 3. Memorize Room

It is a product service which is a course center for tutoring some subjects like math, physics, biology, and chemistry. Their target market is all students both in junior high school and high school. The new innovation of this tutoring place is they offer learning activity in outdoor environment that will make students less blasé and bored, explore the surrounding environment, and increase their enthusiasm for learning. This business is also a collaboration with existing services around Tanjungpura University students, because most course centers are limited to 1 (one) subject. They also provide online facilities that will be developed through a digital-based learning platform that makes it easier for tutors to provide learning through video conferences, questions, quizzes, and materials. This e-learning platform will also be an advantage to encourage business services in reaching their market because it can reach more students outside the area.

### 4. Super Cheewe (Fruit Mochi)

This snack is popular among youth, because innovation is not limited to the use of peanut filling or fruit jam in general. Super Cheewe comes with a whole fruit filling, which the group refers to as a boom, such as Strawberry and Kiwi combined with sweet chocolate. The group was interested in selling Super Cheewe from the process of observing this viral mochi on social media. However, they offer a modification with chocolate filling. Super Cheewe also has fascinating packaging, and in 1 box contains 5 medium-sized Super Cheewe.

### 5. Gelor Chips (Gedebong Banana and Moringa Leaf Extract)

Gelor products are made from banana trees (*gedebong*). They made the banana trees into crunchy chips that everybody likes. The group saw this opportunity by modifying the *gedebong* chips with another seasoning which is from moringa leaves powder. Moringa leaves are believed to be a food ingredient that has many benefits, especially adding more nutrition. The group saw a business opportunity, as *gedebong* banana chips were already known to local community, they add new flavors to it which is the moringa extract flavor to compete in a bigger market. The group is also committed to offering products that are healthy and have nutritional value. The group also continues to carry out entrepreneurial opportunity commitments due to the open market opportunities, as well as their products being branded as having health benefits, easy to find and at affordable prices.

### 6. Awur-Awur Mplok (Rujak Kuah Pindang)

Awur-Awur Mplok is a business product which is *pindang* salad dressing, they offer a new and unique flavor. Salad dressing in general is basically from brown sugar and other spices but Rujak Kuah Pindang is different. It served with combination of fruits and vegetables with some dressing from a mixture of *pindang* (fish). The innovation of Rujak Awur Awur Mplok is from the combination of the fruit and vegetable which has interesting texture with perfect crisp. Other than that, assorted fruits and unique sweet and sour taste in the salad are the selling points to attract customers. For marketing, they have used digital-based technology to reach all regions. The Awur-Awur Mplok business group points at a wider market segment. This business group always do market research systematically to identify opportunities and challenges.

## 7. Hilo Cheese Roll

*Hilo cheese roll* originated from cooking content, namely "Milo Cheese Roll" which comes with varying flavors. Hilo Cheese Roll changed the base ingredient which is spring roll skin into bread. The group commits to make flavorful product, attractive packaging, enjoyable taste and offline and online marketing.

- *Validity and Reliability*

The results of validity test by the economists showed that assessment is at the average of 4.58 within very good category (range of scores from 1-5), and educational evaluation experts at the average of 4.68 which is also within very good category. Thus, the student innovativeness instrument required the validity of the instrument. The correlation test results on the assessment of the two assessors, showed a correlation coefficient of 0.932 with a significance of 0.000 in the experimental group and 0.776 with a significance of 0.000 in the control group. By these results, it is concluded that the student innovativeness instrument meets the reliability.

- *Normality Test*

The normality test results using the Kolmogorov-Smirnov test formulation showed the probability value for the experimental class data was 0.64 (greater than 0.05), while the control group reached 0.58 (also greater than 0.05). Thus, the data on student innovativeness in the two groups were normally distributed. The homogeneity test results of the test of homogeneity of variance formulation, showed a Levene statistic value of 2.445 at a probability value of 0.118 > 0.05. Thus, the variance of student innovativeness data is homogeneous.

- *Hypothesis Test*

The results of hypothesis testing are summarized in [Table 4](#).

**Table 4**

*Summary of Research Hypothesis Test Results.*

Variables	Group	N	Mean	F value	Sig
Student Innovativeness (H1)	Experiment	123	88.24	775.834	0.000
	Control	119	72.05		
Student Innovativeness (H2)	Social and Humanities	133	80.45	.094	0.759
	Science and Technology	109	80.08		
Student Innovativeness (H3)	EL Model Interaction - Science Field	-	-	285.593	0.000

**Source:** Primary Data Processing.

For the first hypothesis, the research F value was 775.834 with a probability value of  $0.000 < 0.05$ . This shows that there is a difference in student innovativeness in creating startups business (entrepreneurial products/services) between the experimental class that uses Kolb's *experiential learning* model and the control class that does not use the model. Due to the average value of the experimental class is higher than the control class, it concluded that Kolb's *experiential learning model* has a significant effect on student innovativeness.

For the second hypothesis, the research F value is 0.94 with a probability value of 0.759 > 0.05. This result confirms that there is no difference in the innovativeness of students in creating startups business (entrepreneurial products/services) between students from the Social and Humanities group and the Science and Technology group. Thus, it can be concluded that there is no influence of student science field on student innovativeness in creating startups business (entrepreneurial products/services).

For the third hypothesis, the F value is 285.593 with a probability value of 0.000 < 0.05, which means that there are differences in the innovativeness of students in creating startups business (entrepreneurial products/services) as a result of the interaction of Kolb's *experiential learning* model with the students' field of study group. Thus, it is concluded that there is a significant interaction effect between Kolb's *experiential learning* model and students' science field on students' innovativeness in creating startups business (entrepreneurial products/services).

To find out which science field group has the best experience with the implementation of EL in entrepreneurship learning in universities, a *post hoc* analysis test was conducted. The results of the *post hoc* analysis is shown in Table 5.

**Table 5**

*Post Hoc Analysis of Field of Study Group.*

Methods and Science Groups	N	Subset for alpha = 0.05			
		1	2	3	4
Control-Social and Humanities	64	73.250			
Control- Science and Technology	55		70.672		
Duncan <sup>a,b</sup> Experiment- Social and Humanities	69			87.130	
Science- Science and Technology	54				89.666

The analysis results as shown in Table 5 indicates that the Science and Technology experimental group has the best innovativeness in producing startups business (entrepreneurial products/services) compared to the Social and Humanities experimental group, especially compared to the control group. The high innovativeness may be due to the fact that science and technology students have stronger entrepreneurial characteristics.

## Discussion

Student entrepreneurial innovativeness indicated with some real thing such as the process of creating new ideas, analyzing new opportunities and needs in the market, commercializing products that depend on the availability of local resources, and even the process of introducing new technology applications to compete (Haftor & Costa, 2023). In the context of this research, there are two important points of student innovativeness in creating a business as an impact of EL Kolb's intervention, which are product innovation in business and innovation in product marketing. With the innovative products, students have created new businesses to meet market needs. The second innovativeness is related to new methods in marketing. According to Kristiana et al. (2022), digital-based product marketing portrays innovation as a characteristic of new startups business. Empirical evidence shows that digital marketing models can increase competitiveness, productivity,

economic growth, and customer loyalty (Niemand et al., 2021); it is effective for increasing business potential, benefits, and superiority (Saura, Reyes-Menendez, & Palos-Sanchez, 2020); accommodate market challenges and opportunities (Buckley & Nzembayie, 2022); very helpful for MSME players in Indonesia to increase sales turnover (Redjeki & Affandi, 2021). Digital-based marketing, starting from content, photos and product advertisements, is more attractive both in the ecommerce and the most popular marketing platforms in Indonesia, such as Tiktok live, Instagram, and Facebook.

Student's innovativeness in creating startups business is inseparable from the implementation of Kolb's EL which refers to the four components of EL which emphasis on entrepreneurial experience, through interaction, collaboration, and entrepreneurial practice. The difference in innovativeness between the experimental and control groups indicates that EL is a learning model with quality, because it develops critical thinking skills and entrepreneurial abilities, that focus on learners' complicity to explore opportunities in a dynamic environment to create ideas for new products (El-Badawy & Chahine, 2017). EL implementation in universities is developing business plans, starting start-ups, interviewing successful entrepreneurs, internships, simulations or field studies, advertising classes (Obi, Pecenka, & Clifford, 2022). In terms of science field. It seems to be no difference between the innovativeness of students in creating startups business from the Science and Technology group and the Social and Humanities group. Moreover, there is no difference between excellent and good accreditation of the universities. Whereas according to the study of Grau and Akin (2011) that EL is very important to be applied to students majoring in non-business because it is good to connect business concepts through the experience of creating start-up business.

This process of entrepreneurship through EL is an example of *concrete experience* (Svinicki & Dixon, 1987). *Concrete experience* starts with observing and analyzing a product that impacts learners' feelings and intuition to comprehend the real world (Zhang et al., 2021). The *concrete experience* stage in entrepreneurship teaching has helped learners to critically understand and apply new experiences, such as analyzing and examining market opportunities (Honig & Hopp, 2019). This process is the starting point for entrepreneurship, and an important indicator of creative thinking (Aflatoony & Wakkary, 2015). Meanwhile, creativity is an important key in entrepreneurship, as it leads to innovative actions (Li, Li, & Lu, 2022).

The results of taking business/market opportunities are a way for students to reflect on learning experiences (*reflective observation*). The output of EL is about problem solving, great logical thinking, integrative thinking, goal clarification, open to new ideas (Leary & Sherlock, 2020). According to (Harper-Anderson & Lewis, 2018), reflective observation requires critical reflection because it acts (conducting investigations and testing the appropriateness of abstract conceptualizations) as a mediator of meaning making. If learners are encouraged to reflect on entrepreneurial practices at university, learners no longer only focus on how but consider why they do it (O'Flynn et al., 2023). With reflection, students express their intention to create innovative entrepreneurial products/services, marketing, and the commitment to become an entrepreneur as well. Commitment is important because it has a direct effect on students' intentions (Li et al., 2022).

In addition to these two elements, EL also helps strengthen the experience through testing the entrepreneurial learning experience with business theory (*abstract*

conceptualization). Smith (2011) says that *abstract conceptualization* is an important aspect because it involves awareness of the challenges, risks of the products that have been created, capital even it is rough. In *abstract conceptualization*, students in groups design a business model, prepare the fund, marketing, market segments, and others which is a part of the business strategy in starting a business. A successful business needs business strategy, such as marketing and controlling the market (Piñeros, 2020). The results of the study found that there is an effect of business strategy on company performance (Huang et al., 2012). This shows that abstract conceptualization provides students with learning experiences in determining competitive strategies.

The last element of the EL process is that students create innovativeness in producing business products. The students test new concepts through business/entrepreneurial practices (*active experimentation*) (Svinicki & Dixon, 1987). In the active experimentation cycle, students train themselves to make predictions about their product and test the products. It starts from get the ideas, take business opportunities and release to the market (McCull-Kennedy & Fetter Jr, 2001). The groups' products/services are unique and competitive in the market, including the strength in digital-based marketing. Students in the experimental group have succeeded to digitalize their products and sell it online marketing platforms. This activity identified as a real entrepreneur thing (Ramadani et al., 2019) which has provided entrepreneurial experience to students (Stirling, 2017). Therefore, Matsuo (2015) suggested to increase *active experimentation* significantly through the practice of creating a business that has previously analyzed all challenges.

Kolb's EL model with four cycles provides learners with a real experience of innovativeness in creating entrepreneurial opportunities. The four cycles of the EL component can sustain entrepreneurial learning because it provides an understanding of the content, the professional world, the manipulation of opportunities, and it supports to achieve a significant entrepreneurial learning (Calvert, Crowe, & Grenyer, 2016). Furthermore, Radu Lefebvre and Redien-Collot (2013) said that when entrepreneurship course uses the EL model, it facilitates students to develop creative and critical skills, launch new businesses, and or develop business plans. With this EL model, students in universities can connect theory with entrepreneurial practices in the business world so that they can bring out innovativeness in creating startups business (Cheng, 2020). This finding has confirmed previous findings, such as the findings of Chen, Wang, and Zhong (2019) showed that EL can develop learners' creativity and innovation. EL also has a positive impact on entrepreneurial intention, self-efficacy (Taneja et al., 2023); improving learners' soft skills (Bartolotta, Gaggioli, & Riva, 2023); communication skills (O'Flynn et al., 2023). These soft skills are needed for business sustainability (Tadger et al., 2022).

Making startups business in universities is ideally prepared by having capital resources, such as having experience in the industrial world (Klingbeil et al., 2019); availability of facilities to support entrepreneurial learning (Boardman & Gray, 2010); supportive university entrepreneurial environment and service quality (Romero-Colmenares & Reyes-Rodríguez, 2022). The quality of service from educational institutions is still low, which has an impact on poor quality learning. A-accredited universities in Indonesia are the models of universities that have met the standards of a better learning process, but in reality, quality entrepreneurship learning has not yet been realized. In addition, Universities in Indonesia do not have a standard lecturer who specifically teaches

entrepreneurship learning. Whereas, educator relationships and entrepreneurial backgrounds are focal points that can spread business energy into the student ecosystem (Radko, Belitski, & Kalyuzhnova, 2023). Although, we believe that universities facilitate students innovation and support entrepreneurship regardless of accreditation level (Cunningham & Menter, 2021).

### Conclusion, Recommendations and Limitations

Based on the analysis and discussion above, it can be concluded that Kolb's EL model is effective on students' innovativeness in creating start-ups business. The EL Kolb model provides real experience in learning and practicing entrepreneurship. Innovativeness is not only about the products/service but also the marketing method which gives a space to make *entrepreneurial opportunities*. The results of the study found that there is no difference in student innovativeness between the Science and Technology group and the social and Humanities group, although many studies have found different entrepreneurial characteristics from each group of science fields. Even though there is no direct effect, the science field group has a significant effect when interacting with Kolb's EL model on student innovativeness. When compared between the groups, the experimental group of Science and Technology field has better innovativeness than the Social Science group.

The practical implications of the study include preparing graduates who are capable to create start-ups business, the use of EL Kolb in entrepreneurship courses in higher education is a solution offered based on the results of this study. Despite the empirical rigor that exists, it is highly recommended that the limitations of the current study be further explored by other researchers. This includes expanding the sample of the study, conducting follow-ups through research and development, combining various relevant learning theories, etc. As regards the entrepreneurial learning, however, the areas for further research included: regional advantage-based learning contents, Resource-Based Views/RBV-based learning, integration with competitive advantage factors, expansion of the entrepreneurial parameters (entrepreneurial intentions, entrepreneurial characteristics, entrepreneurial behavior, and intrapreneurship). In addition, it is a priority for universities to align entrepreneurship education with entrepreneurial activities outside the science field.

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