



Designing The Structural Model of Students' Entrepreneurial Personality in Vocational Education: An Empirical Study in Indonesia

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Abstract: The importance of forming an entrepreneurial personality as a step to creating ideal entrepreneurial candidates through vocational education is still a significant obstacle. Currently, various theories and research studies reveal the role of digital literacy, interest in entrepreneurship and self-efficacy in shaping entrepreneurial personality. This study aims to examine the significant effect of digital literacy, interest in entrepreneurship, and self-efficacy on the entrepreneurial personality of vocational education students. In addition, self-efficacy was also tested as a mediator of the indirect influence of digital literacy and interest in entrepreneurship on entrepreneurial personality. Ex-post facto research with structural quantitative data approaches to examine as many as 597 vocational education students in the Province of Yogyakarta-Indonesia. Data collection was assisted using a closed questionnaire with a four Likert scale which had been tested for validity and reliability. Structural Equation Modeling is used to analyze the data through path analysis and bootstrap methods. The results of the path analysis show that digital literacy, interest in entrepreneurship, and entrepreneurial self-efficacy have a significant effect on entrepreneurial personality. In addition, a structural model that uses a mediator of entrepreneurial self-efficacy has also been tested significantly through bootstrap analysis with a confidence interval of 97.5%. Therefore, these results strengthen the theory that in shaping an entrepreneurial personality, digital technology literacy, interest in entrepreneurship and entrepreneurial self-efficacy are needed, so vocational education must strengthen these aspects.

Keywords: Digital literacy, entrepreneurship interest, self-efficacy, entrepreneurship personality

1. Introduction

The increase in the number of workers inversely proportional to the availability of job opportunities is a crucial issue that is very important to pay attention. Vocational education as an institution that aims to prepare competent graduates according to industry qualifications is very important to address this issue (Arifin et al., 2020; Billett, 2006; Pavlova, 2009; Sariwulan et al., 2020). The facts of previous research in developing countries such as Indonesia revealed that the absorption rate of vocational education graduates is inversely proportional to the number of graduates (Afandi & Wijanarka, 2019; Larosa & Munadi, 2019; Nurtanto, Arifin, et al., 2020). Data from the Central Statistics Agency (CSA) shows that the Open Unemployment Rate in vocational education is still the highest compared to other education levels, at 11.13% in August 2021 (Badan Pusat Statistik, 2022). This phenomenon strengthens the government's policy in deciphering the unemployment rate, namely preparing graduates with entrepreneurial skills. Vocational education graduates focus on three aspects as indicators of graduate success: work, continuing higher education, and entrepreneurship. However, the trend of entrepreneurship graduates is still limited and does not yet have a relevant implementation model. While the entrepreneurial ability for students is part of the purpose of holding vocational education. They are departing from these problems innovations have been sparked by relevant stakeholders, especially by implementing entrepreneurship education policies in vocational education (Amiel et al., 2021). This policy, it is hoped will equip students with entrepreneurial competencies, so that when graduate they can choose the option of entrepreneurship independently (Stadler & Smith, 2017). In addition, encouraging entrepreneurship in vocational education is also hoped that future graduates can create jobs (Handayati et al., 2020).

Teaching entrepreneurship subjects to vocational education students is indeed very good in supporting the sustainability of vocational education as an institution to produce graduates who are competent and ready for entrepreneurship (Mei et al., 2020; Shu et al., 2020). However, several important factors must be considered to support success in producing these graduates. One of the main factors that play an important role in influencing success is internal factors within the students themselves (Ayob, 2021). The key factor is none other than the entrepreneurial personality from within himself (Sawang, 2020). Entrepreneurial personality reflects someone competent and ready for entrepreneurship later (Adiandari et al., 2019). Entrepreneurial personality refers to the attitudes and characteristics of entrepreneurs or prospective entrepreneurs based on their aspects (Obschonka et al., 2019). Aspects of entrepreneurial personality generally refer to mental attitudes, beliefs, work ethic, results orientation, self and other management, and problem-solving attitudes in entrepreneurship (Porcar & Soriano, 2018). The strength of these aspects will also help in growing entrepreneurial intentions in vocational education students (Chipo et al., 2018; Frago et al., 2020). Entrepreneurial personality is very important in influencing student entrepreneurship decision making (Garrett et al., 2020). In addition, optimism can be built properly if supported by a strong entrepreneurial personality (Bernoster et al., 2018). This is evidenced by previous research which revealed a significant influence of entrepreneurial personality on his decision to set up a business (Nguyen, 2020; Yi et al., 2020). Other studies also confirm that most vocational education graduates who set up businesses have had good entrepreneurial personalities since they were in school (Lu et al., 2021; Nguyen, 2020).

The role of Vocational Schools in shaping entrepreneurial personalities is to cultivate planned behavior based on beliefs and evaluations in the form of personal attitudes, behavioural control, and psychological aspects (Baciu et al., 2020; Liu et al., 2019), which are formed through the external and internal environment. The external environment is involving practitioners according to relevant businesses to strengthen the area of entrepreneurial motivation, strengthening interest in entrepreneurship (Boldureanu et al., 2020; Ismail et al., 2019), while the internal environment is the commitment of vocational schools to strengthen business services (Dawe & Nguyen, 2007). The school has the same goals between teachers and students and facilitates the support capacity as needed. Teachers and students collaborate in running entrepreneurship, facilitating entrepreneurial triggers such as incubators, associations, and involvement of businesspeople in assisting students who can actualize entrepreneurship according to their interests (Amalia & von Korfflesch, 2021). Entrepreneurial culture in vocational education must be carried out gradually and consistently by considering the level of education, the needs of the business area, and the learning stages aimed at facilitating students' diverse characteristics (Pimpa, 2019). A learning environment adapted to the business environment, teacher involvement according to their area of expertise, practitioner involvement in strengthening self-confidence, supportive school facilities and collaboration between vocational students produce vocational school graduates with quality entrepreneurial personalities.

The importance of an entrepreneurial personality in supporting the success of entrepreneurship education in vocational education is unfortunately contrary to the facts revealed directly in the field. The results of observations in several vocational educations in Indonesia with different characteristics reveal the weak entrepreneurial personality of students. This can be seen when students take entrepreneurship lessons that show low student behaviours that lead to indicators of entrepreneurial personality. Meanwhile, interviews with researchers revealed that students admitted that they lacked the right strategies and steps to support the formation of behaviours that reflect an ideal entrepreneur. Related research conveys the same thing that reveals difficulties in forming in students (Purusottama & Trilaksono, 2019). In addition, enthusiasm and enthusiasm for learning in entrepreneurship learning have not appeared significantly, so it is also suspected as an indicator of low entrepreneurial personality (Darmawan et al., 2021). Crucial factors certainly cause the problem of the low entrepreneurial personality of students. Among them is the low level of self-efficacy, including

the ability to motivate oneself, self-assess and solve problems; low generality includes behavioural beliefs and the ability to achieve success; and low self-confidence, in the form of belief in achieving goals and dealing with problems. The root of the emergence of these crucial factors is the low commitment of students during the learning process.

Entrepreneurial self-efficacy is one of the key factors that can affect a person's entrepreneurial personality (Nowiński et al., 2019). Self-efficacy will play a role in giving strong confidence to someone to make decisions in entrepreneurship so that if self-efficacy is formed in entrepreneurial learning, it will create a good stimulus for the growth of entrepreneurial personality in vocational education students (Hassan, 2020; Zubić et al., 2021). Given that someone who has already decided to become an entrepreneur will try to increase his capacity in that field so that the estuary of personality in entrepreneurship is also formed (Misra & Mishra, 2016). However, other strong factors are supported by informing a comprehensive entrepreneurial personality for vocational education students. The shift in technological progress in the 21st-century also requires competency upgrades to match developments in entrepreneurship (Bican & Brem, 2020; Sahut et al., 2021). The era of digitalization inherent in the development of 21st-century technology is certainly a focus for upgrading its competence. In this era, comprehensive digital technology literacy will play a role in providing views (Astuti et al., 2021; Majid et al., 2020), and developing ways of entrepreneurship more effectively and efficiently (Nambisan, 2017; Rippa & Secundo, 2019). In addition, forming an entrepreneurial personality can also occur indirectly. High digital technology literacy will cause someone to have strong confidence in students' abilities to be entrepreneurs. Thus, this refers to self-efficacy in entrepreneurship, which also plays an indirect role in channelling influence on digital technology literacy. In line with this, it will indirectly provide a good stimulus for someone to develop an entrepreneurial personality (Lee, 2021; Nurtanto, Sudira, et al., 2020; Vicente-Ramos & Cano-Torres, 2022).

Digital technology literacy is also known to be a factor causing the growth of interest in entrepreneurship which can further influence entrepreneurial personality to grow. Interest in entrepreneurship can be said to be an important factor that triggers a person to be enthusiastic and active in developing competence in entrepreneurship (Sahut et al., 2021). In addition, interest in entrepreneurship will also provide a person's perspective to focus his attention on the world of entrepreneurship (Fellnhöfer, 2021). As interest in students grows, students will increasingly focus on constructing entrepreneurial personalities. The existence of an interest in entrepreneurship in a person will spur him to develop the competencies needed in entrepreneurship so that the estuary of the entrepreneurial personality will grow strongly (Fragoso et al., 2020; Lu et al., 2021).

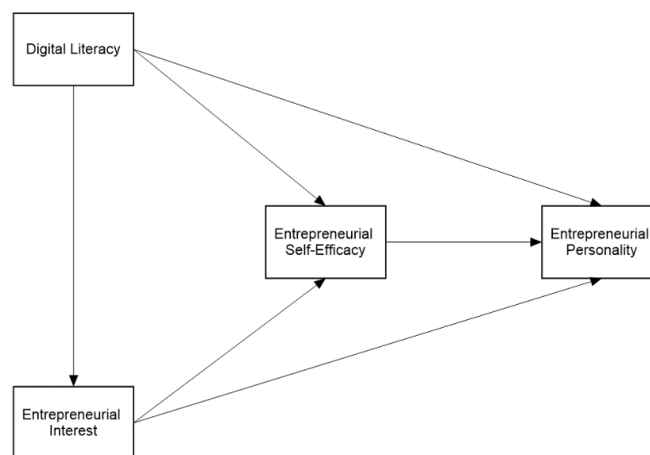


Fig. 1 - Conceptual research framework

In addition, forming an entrepreneurial personality can also occur indirectly. High interest will cause a person to have high confidence in his decision in entrepreneurship (Li et al., 2020). In addition, a strong interest in students will provide strong confidence in their abilities to be entrepreneurs (Ismail et al., 2019; Shukla et al., 2020). Thus, it refers to self-efficacy in entrepreneurship which also plays a role in channeling indirect influence on interest in entrepreneurship. Based on the description of the problem and analysis of innovation in overcoming the problem, the purpose of this study is to examine the direct influence of digital literacy, interest in entrepreneurship, and entrepreneurial self-efficacy on the formation of the entrepreneurial personality of vocational education students. In addition, the indirect effect of the exogenous variable was also analysed through the involvement of the role of entrepreneurial self-efficacy as a moderator. Figure 1 presents a conceptual framework of the line of influence of exogenous variables on endogenous variables.

2. Literature Review and Hypotheses

2.1 Digital Literacy in Entrepreneurial Interest

Interest is an important aspect in the emergence of a stimulus from within students in the form of a tendency to do something they want to do. In entrepreneurship, interest is very important for someone to have, which will be an important foundation in spurring the formation of entrepreneurial competencies. Interest in entrepreneurship arises in a person without coercion (Baum et al., 2007; Fellnhofner, 2021). Sawang (2020) defines interest in entrepreneurship as a tendency, concentration, desire, or interest in a particular line of business followed by an effort to achieve it. Interest needs to be grown as early as possible to get a good effect for the construction of the aspects needed to accommodate interest in entrepreneurship so that the goals in entrepreneurship will be achieved (Fellnhofner, 2021). Vocational education is very important to stimulate good interest in students, through their learning (Matthias, 2012). However, vocational education needs to pay attention to important aspects that cause the growth of interest in entrepreneurship in students. Knowledge of the ins and outs of a business that offers a good prospect is a key factor that will stimulate the growth of interest in entrepreneurship (Sahut et al., 2021). In addition, the relevance of a business that has good prospects with one's field of expertise and competence is also a good surplus in the growing interest in entrepreneurship (Hamburg, 2021).

Knowledge of the business world is certainly strongly influenced by competence, which refers to the power of exploration. Good exploration power will help students to know and understand information related to a business so that students can assess and filter a business field that can be run (Rippa & Secundo, 2019). In the 21st century, the shift in technology towards digital has made it easier for humans to explore and extract information comprehensively, supported by excellent ease and effectiveness (Schwab, 2016). In addition, digital competence can be a provision of competence in running entrepreneurship in the 21st century, so student interest will also grow in line with the convenience of digital technology to achieve entrepreneurial goals (Muraya et al., 2019). Thus, digital technology competence is very important in growing students' interest in entrepreneurship because it can provide students with comprehensive knowledge and understanding of a business (Elia et al., 2020; Sahut et al., 2021). However, digital technology literacy is very important in forming digital technology competencies, so digital literacy is very important to be grown in students. Digital literacy acts as an understanding capital regarding the uses, benefits and ways of using digital technology to carry out activities, including entrepreneurship (Hamburg, 2021; Lankshear & Knobel, 2008). Thus, it is very important for vocational education in growing digital literacy which can lead to the growth of students' interest in entrepreneurship.

H1: There is a significant direct influence of digital literacy on interest in entrepreneurship

2.2 Digital Literacy and Entrepreneurial Interest in Self-Efficacy

Self-efficacy always refers to a psychological process that reflects a person's ability or competence to perform a task, achieve goals, or overcome obstacles (Bandura, 1995). Self-efficacy will lead to confidence and self-confidence in something that will be done (Bandura, 1982). Growing self-efficacy and entrepreneurial personality is strongly influenced by various important factors related to competence (Adiandari et al., 2019). The first is technological competence, a strong basis for why self-efficacy and entrepreneurial personality are formed (Adiandari et al., 2019). In this context, technological competence which refers to digital technology competence will play a role in providing its reflection which leads to confidence and self-confidence to carry out certain work tasks (Elstad & Christophersen, 2017; Yerdelen-Damar et al., 2017). A stronger mastery of digital technology competencies will also underlie a person's ability to assess one's own ability to run a business (Hamburg, 2021). In this context, a strong digital literacy is needed as a basis for a person in shaping digital technology competencies, so that the estuary can also affect self-efficacy in entrepreneurship. Many previous studies have revealed the role of digital literacy in strengthening digital technology competencies to run a job or business (Elia et al., 2020; Falloon, 2020). Digital literacy is a basic asset in the form of a comprehensive understanding of how to use digital technology effectively and efficiently (Lankshear & Knobel, 2008). This means that the strength of digital literacy will align with the growth of self-efficacy in entrepreneurship (Fellnhofner, 2021). Thus, vocational education needs to equip digital literacy as the basis for forming digital technology competencies in students to increase entrepreneurial self-efficacy, so that later when they graduate, they will have strong self-efficacy in entrepreneurship.

H2: There is a significant direct effect of digital literacy on entrepreneurial self-efficacy.

In addition to referring to digital literacy which is seen as influencing the growth of students' self-efficacy in entrepreneurship, there is an interest in entrepreneurship that can also influence it. Interest in entrepreneurship is directly related to the psychological process of students to focus their attention on a business that is considered memorable for them (Baum et al., 2007; Sawang, 2020). Previous research revealed that students with high self-efficacy in entrepreneurship have been interested in entrepreneurship for a long time (Chien-Chi et al., 2020; Neneh, 2020). When students have an impression of a business, students will automatically have confidence in the business, so the potential for students to choose the business will be high (Li et al., 2020). High interest will cause a person to have high confidence in his decision in entrepreneurship (Nowiński et al., 2019). In addition, a strong interest in students will provide strong confidence in their abilities to be entrepreneurs (Osakede et al., 2017). Thus, it strongly believes that students' interest in entrepreneurship can be the background for the growth of students' self-efficacy in entrepreneurship.

H3: There is a significant direct influence of interest in entrepreneurship on entrepreneurial self-efficacy.

2.3 Digital Literacy, Entrepreneurial Interest and Self-Efficacy in Entrepreneurial Personality

Porcar & Soriano, (2018) explaining entrepreneurial personality refers to aspects that include mental attitudes, beliefs, work ethic, results orientation, self-management and other people, and problem-solving attitudes in entrepreneurship. These aspects are inseparable from the important competencies that make them up. Several studies report that aspects such as work ethic, management, and problem-solving need the right supporting competencies (Li et al., 2020; Obschonka et al., 2019). In addition, mental attitude and belief in entrepreneurship will also be aligned with competence growth. In the development of technology in the 21st century, digital technology competence is an important competency that must be possessed to improve aspects of entrepreneurial personality (Oppong et al., 2020). Mastering digital technology competencies that are getting stronger will also underlie a person's personality in doing a job that requires these competencies to complete (Falloon, 2020; Roy & Das, 2020). Various studies have provided concrete evidence that to form an entrepreneurial personality in the era of digitalization, it is very necessary to have the role of technological competence that is developing in that era (Do et al., 2020; Elstad & Christophersen, 2017; Yerdelen-Damar et al., 2017). Thus, vocational education needs to equip students with strong digital technology literacy for entrepreneurial personalities, so that when they graduate, they will have a strong entrepreneurial personality.

H4: There is a significant direct influence of digital literacy on entrepreneurial personality.

Castro & Zermeño, (2021); Schmitt & Husson, (2017) reported the results of his research that the entrepreneurial interest of a person or student became an important foundation informing important competencies in the operation of a business. Interest in entrepreneurship is believed to stimulate the growth of competencies necessary to run a business (Obschonka et al., 2019). In other words, someone who has focused his attention and is interested in entrepreneurship in a particular field, then that person will be motivated to upgrade his competence according to the characteristics of the business field (Li et al., 2020). Thus, the entrepreneurial personality which reflects competence in running a business will be sought to be formed by someone if that person has an interest in entrepreneurship (Ng et al., 2021). Various studies have reported that students who have been observed to have entrepreneurial personalities already have a high innate interest in entrepreneurship (Obschonka et al., 2019; Salmony & Kanbach, 2021). However, many entrepreneurial personalities are reported to be adjusted to students' interests in an area of interest (Salmony & Kanbach, 2021). Thus, interest in entrepreneurship is very important to be instilled in students to form entrepreneurial personalities in the future.

H5: There is a significant direct influence of interest in entrepreneurship on entrepreneurial personality.

Self-efficacy will play an important role as a tool from within a person that serves to convince himself that someone can carry out an activity (Mei et al., 2017; Wang et al., 2016). All jobs or businesses that someone runs must require self-efficacy in their implementation. In the context of entrepreneurial personality, self-efficacy will play a role in providing strong confidence to someone to make decisions in entrepreneurship, so if self-efficacy is formed, it will create a good stimulus for the growth of entrepreneurial personality in vocational education students (Hassan, 2020; Zubić et al., 2021). Given that someone who has already decided to become an entrepreneur will try to increase his capacity in that field so that the estuary of personality in entrepreneurship is also formed (Kumar & Shukla, 2022). Various studies also reinforce with reports that students will more easily form competencies that are part of the entrepreneurial personality aspect when they have high self-efficacy in entrepreneurship (Kumar & Shukla, 2022; Li et al., 2020).

H6: There is a significant direct influence of entrepreneurial self-efficacy on entrepreneurial personality.

2.4 Entrepreneurial Self-Efficacy Mediation

The formation of self-efficacy is widely reported because of the influence of certain aspects and as a trigger for the emergence of other aspects. Self-efficacy is seen as an independent variable that can grow due to the influence of a variable and can affect a variable (Şahin et al., 2019). But self-efficacy can also act as an intervening variable that can mediate the effect of exogenous variables on endogenous variables (Hoang et al., 2021; Kumar & Shukla, 2022). In forming a student's entrepreneurial personality, it is very important to trace the basis of its formation to the end of its formation. In this study, digital literacy is an exogenous variable thought to be the basis for forming an entrepreneurial personality. Besides being able to directly affect entrepreneurial personality because digital literacy can form digital technology competencies that can also be oriented to the growth of entrepreneurial personality. However, before the entrepreneurial personality is formed in students, self-efficacy is formed first because of the strong digital technology competence within the student (Galindo-Domínguez & Bezanilla, 2021). High digital technology literacy will cause someone to have strong confidence in students' abilities to be entrepreneurs (Elia et al., 2020; Oppong et al., 2020). Thus, this refers to self-efficacy in entrepreneurship which also plays a role in channeling indirect effects of digital technology literacy on entrepreneurial personality (Adiandari et al., 2019; Monllor & Soto-Simeone, 2020). Then the extent to which interest in entrepreneurship can be firmly embedded in students will trigger them to strive to have an ideal entrepreneurial personality according to their interests (Osakede et al., 2017; Schmitt & Husson, 2017). But before the personality is formed, students' interest in a business field will trigger the growth of confidence within students to make their decisions (Neneh, 2020). In addition, high interest can be a tool for students to measure and ensure the extent to which their competence can run a business they are interested. Thus, the interest in entrepreneurship also indirectly affects entrepreneurial personality through the mediation of entrepreneurial self-efficacy (Adiandari et al., 2019).

H7: There is a significant indirect effect of digital literacy on entrepreneurial personality through the mediating role of entrepreneurial self-efficacy.

H8: There is a significant indirect effect of entrepreneurial interest on entrepreneurial personality through the mediating role of entrepreneurial self-efficacy.

3. Method

3.1 Research Design

This study is an ex-post-facto study that adopts a research design (Cohen et al., 2011). The study involved student respondents in vocational education in Indonesia who had organised learning and entrepreneurship programs in schools. This research uses a quantitative data approach and adopts a structural equation modelling (SEM) analysis technique to measure the path coefficients of direct or indirect influence between exogenous and endogenous variables, both without mediators and with intervening variables mediators who have strong support from existing theories. Data on all variables were collected through a questionnaire method distributed online using Google Form.

3.2 Population and Sampling

This study involved 12th-grade students from vocational education in the province of Yogyakarta-Indonesia. The selection of population and samples were not taken from graduates but from students who were still active in learning at school. The 12th-grade students were chosen because they studied entrepreneurship for about two years. Due to many vocational educations in Yogyakarta Province and the limitations of the research, the sampling technique was carried out using a clustering technique. The sample selection in a cluster is carried out with the criteria of representative public and private vocational education from each district in the province. Then, considering the difficulty of obtaining a complete and ideal number of samples in online learning conditions, students appointed as research respondents in each vocational education were determined voluntarily with a self-submission system through a separate questionnaire before conducting the research. A total of 597 students in vocational education participated in filling out the instrument. They are distributed in 20 Vocational Education Schools, namely ten public schools and ten private schools in the Province of Yogyakarta-Indonesia. The distribution and dimensions of the research sample are shown in Table 1 below:

Table 1 - Background of participants

Dimensions	Category	Public School	Private School	t-value	Sig.
		F (%)	F (%)		
Gender	Male	154 (26.54)	148 (25.57)	2.231	0.155
	Female	159 (25.89)	136 (22.01)	2.231	0.155
Expertise	Technology and Engineering	121 (21.20)	108 (19.09)	0.692	0.527
	IT	108 (17.64)	98 (15.86)	0.692	0.527
	Tourism	84 (13.59)	78 (12.62)	0.692	0.527
Parental background	Civil servant	132 (22.98)	112 (19.70)	0.423	0.694
	Private employees	118 (19.26)	101 (16.30)	0.423	0.694
	Entrepreneur	65 (10.52)	72 (11.70)	0.423	0.694
Regency	Sleman	70 (11.81)	61 (10.68)	2.028	0.077
	Jogjakarta	63 (11.00)	58 (9.71)	2.028	0.077
	Bantul	62 (10.36)	55 (9.39)	2.028	0.077
	Kulonprogo	59 (9.87)	56 (9.06)	2.028	0.077
	Gunung Kidul	57 (9.36)	56 (8.74)	2.028	0.077

3.1 Instruments and Its Validity and Reliability

The data in this study were collected using a questionnaire technique through Google Form, which was carried out from early January to the end of March 2022. A questionnaire with a 4 Likert scale questionnaire was used, with answer options Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The development of the instrument was carried out by adopting the expert opinion of each variable. The instrument is equipped with the respondent's identity, which includes important dimensions related to gender, the field of expertise pursued and the vocational education district where they study. The following description below presents a grid of instruments in this study.

The indicators used to compile the questionnaire instrument first ensured the instrument's validity by developing survey items from the scale developed and validated by previous research. Entrepreneurial interest in students is measured based on four indicators adopted (Castro & Zermeño, 2021; Sawang, 2020). Important indicators include “*attention to entrepreneurial activity, efforts to learn about a business, participation in entrepreneurial activities, and environmental*

support". The four indicators are further elaborated in the form of sub-indicators with a total of 6 sub-indicators according to the theme of each indicator. The total number of entrepreneurship interest questionnaire items that refer to constructing these indicators is 12. Then the entrepreneurial self-efficacy questionnaire is constructed based on indicators that refer to the theory (Bandura, 1982, 2010). Bandura revealed three important indicators included in the self-efficacy dimension, namely "*level, generality, and strength*," which were reduced back to 6 sub-indicators. The total number of self-efficacy questionnaire items is ten statements.

Furthermore, the entrepreneurial personality questionnaire was constructed from the indicators adopted (Obschonka et al., 2019; Sarwoko & Nurfarida, 2021). There are five indicators, which include "*mental attitude, process orientation, entrepreneurial ethos, self-management and other people, and problem-solving attitudes in entrepreneurship*". The five indicators were reduced to 10 sub-indicators with ten items in the questionnaire. Then the theoretical opinion of (Astuti et al., 2021; Mcgrath et al., 2019; Pavlova, 2009) is cited for constructing digital literacy indicators. This opinion has compiled five important indicators "*technology awareness, technological understanding, technological capability, technological creativity, and technology criticality*". The questionnaire items consist of ten statements.

The questionnaire instrument was tested before being used to collect data. To measure the validity and reliability of the instrument, confirmatory factor analysis was used to calculate the level of indicator strength of each variable and its Cronbach alpha value. The measurement results of interest in entrepreneurship are 0.820, digital literacy is 0.887, entrepreneurial self-efficacy is 0.836, and entrepreneurial personality is 0.890. All measurement variables meet the criteria for level good. The instrument has been tested for construct validity by experts in the field of entrepreneurship. This reinforces that validity has definite accuracy (Costa et al., 2019).

3.2 Data Analysis

Structural Equation Modelling (SEM) analysis was used to test the hypothesis of the influence between variables, both direct and indirect effects of exogenous variables on endogenous variables. Path analysis measures the direct effect of exogenous variables on endogenous variables. Meanwhile, the bootstrap method was used to measure the role of entrepreneurial self-efficacy in mediating the indirect effect of digital literacy and entrepreneurial interest on entrepreneurial personality. In this research. Analysis of the data in this study using software support SmartPLS 3.0. The research hypothesis is formulated based on relevant theoretical support related to the line of influence of exogenous variables on endogenous variables directly or using mediation, as proposed in the previous literature review.

4. Findings

4.1 Validities and Reliabilities

Before testing the model using SEM analysis, confirmatory factor analysis was first performed to test the validity and reliability of the instruments and Cronbach's alpha to assess the feasibility and consistency of all indicators in the variables studied. The validity test results show that all indicators on all research variables have an outer loading value exceeding 0.70. None of the indicators of any variables was dropped. All indicators on all instruments have met the criteria for validity and are ready to be used for research (Johnson & Wichern, 2007). The following Table 2 presents the results of the validity tests in more detail.

Table 2 - Validities and reliabilities of instruments

Variable	Indicator	Outer Weight	Outer Loading	Decision
Entrepreneurial interest	X1.1	0.272		Valid
	X1.2	0.332	0.803	Valid
	X1.3	0.306	0.859	Valid
	X1.4	0.330	0.768	Valid
Digital literacy	X2.1	0.206	0.792	Valid
	X2.2	0.150	0.777	Valid
	X2.3	0.273	0.744	Valid
	X2.4	0.270	0.942	Valid
	X2.5	0.294	0.762	Valid
Entrepreneurial Self-efficacy	X5.1	0.325	0.906	Valid
	X5.2	0.453	0.817	Valid
	X5.3	0.369	0.917	Valid
	X6.1	0.206	0.865	Valid
Entrepreneurial personality	X6.2	0.219	0.799	Valid
	X6.3	0.268	0.781	Valid
	X6.4	0.268	0.924	Valid
	X6.5	0.230	0.924	Valid
				0.733

Meanwhile, the reliability test showed that the Cronbach alpha number was included in the reliable criteria on all instruments (Reid, 2014). This shows that the instrument has a good level of consistency for collecting data on each variable. Table 3 presents the results of the alpha reliability test.

Table 3 - Reliabilities of instruments

Variable	<i>a</i>	<i>rho_A</i>	Composit e	<i>AVE</i>	Decision
Entrepreneurial interest		0.824	0.881	0.650	Reliable
Digital literacy	0.820	0.913	0.917	0.689	Reliable
Entrepreneurial Self- efficacy	0.887	0.864	0.901	0.752	Reliable
Entrepreneurial personality	0.836	0.901	0.920	0.698	Reliable
	0.890				

4.2 Model Fit Index

The model suitability test is used to measure the level of conformity of the structural model. The overall fit index of the research model is presented (as the baseline model) in Table 4. As presented, all the overall fit indices of the baseline model performed well. The absolute fit test consists of (a) Chi-square as a measure of the maximum likelihood-based model suitability test (*ML* is small) and Probability (*P*) exceeding 0.05, (b) Goodness of Fit Index (*GFI* 0.90) as a descriptive measure of model suitability, (c) Root Mean Square Error of Approximation (*RMSEA*<0.08) as the approximation value of the mean square root of the error (Jöreskog & Sörbom, 1982). The chi-square value obtained is a relatively small critical number. The probability obtained is a number that shows a high significance. Incremental fit measures include (a) Adjusted GFI (*AGFI*), which is the adjusted GFI value (≥ 0.90), (b) Comparative Fit Index (*CFI*), which is a measure of the suitability of the comparative-based model with the null model (≥ 0.90), (c) Tucker Lewis Index (*TLI*) which measures the relative reduction in discrepancy per degree of freedom (≥ 0.90), and (d) Standardised Root Mean Square Residual (*SRMR*) as a measure of absolute fit and standard differences between observed and predicted correlations (<0.05) (Bentler, 1990; Maydeu-Olivares et al., 2018; Tucker & Lewis, 1973). Based on these results, it can be concluded that the model is fit based on the acquisition of values included in the goodness of fit category so that structural model analysis can be carried out (Johnson & Wichern, 2007). Meanwhile, the structural analysis model used is presented in Figure 2. SEM analysis uses two methods, namely path analysis to determine the direct effect of exogenous variables on endogenous variables. While the second method is bootstrapping to test the role of intervening variables.

Table 4 - Model fit index

Goodness of fit indices	Result	Desired levels
Chi-square	28.911	Small
Probability	0.494	>0.05
<i>GFI</i>	0.902	≥ 0.90
<i>AGFI</i>	0.926	≥ 0.90
<i>CFI</i>	0.913	≥ 0.90
<i>TLI</i>	0.918	≥ 0.90
<i>SRMR</i>	0.041	<0.05
<i>RMSEA</i>	0.077	<0.08

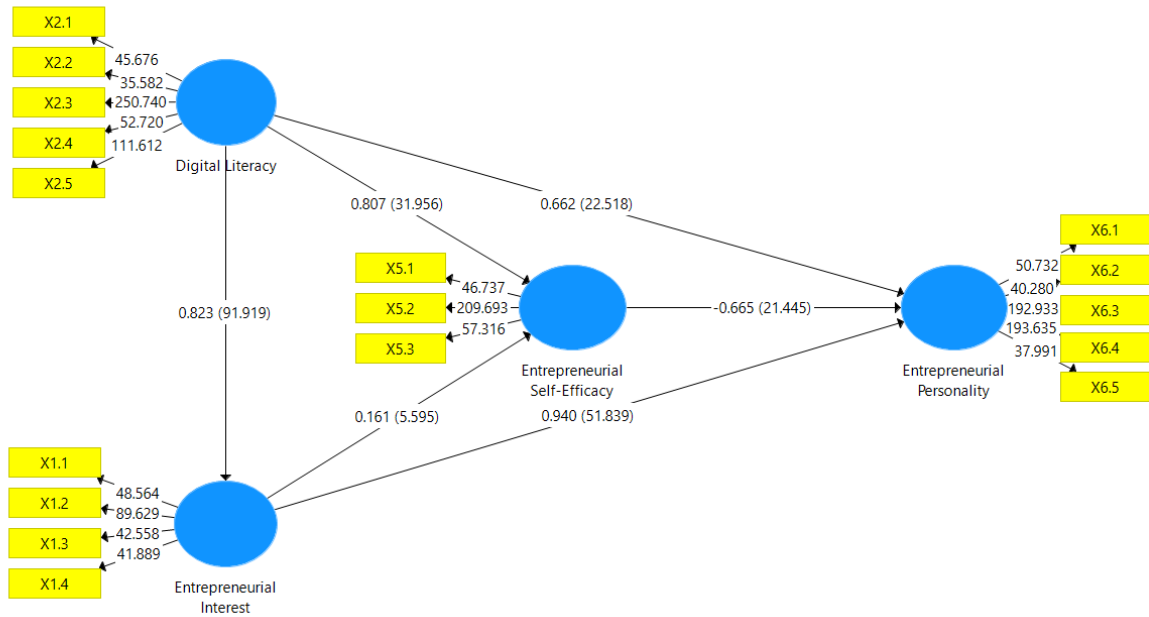


Fig. 2 - Structural model analysis results

4.3 Direct Effect Test

Hypothesis testing 1-15 is seen based on the results of path analysis, to determine the value of T statistic and p-value with a significance level of 5%. In addition, the authors present the confidence intervals obtained at 97.5% (CI 97.5%) and the error rate is 2.5%. Hypothesis testing was conducted to determine the direct effect of digital literacy on interest in entrepreneurship, digital literacy, and interest in entrepreneurship on self-efficacy, and digital literacy, interest in entrepreneurship, and self-efficacy on entrepreneurial personality. The test is carried out using the whole sample and the samples are grouped based on the background of the participants. Tests based on each dimension in the background are carried out to test whether the hypothesis can be tested on all respondents who have various characteristics as shown or not. Only the dimension of the district in the participant's background was not tested because it considers that the district in a province does not have a significant effect on testing quantitative data as reported by several studies. The following Table 5 presents the results of hypothesis testing using path analysis. Meanwhile, Table 6 presents the results of the path analysis on each dimension in the participant's background.

Table 5 - Path analysis test result

Path	t-Value	SE	CI 97,5%	p
Digital Literacy → Entrepreneurial Interest	91.919	0.001	0.840	0.000
Digital Literacy → Entrepreneurial Personality	22.518	-0.001	0.721	0.000
Digital Literacy → Entrepreneurial Self-Efficacy	31.956	0.001	0.857	0.000
Entrepreneurial Interest → Entrepreneurial Personality	51.839	0.000	0.974	0.000
Entrepreneurial Interest → Entrepreneurial Self-Efficacy	5.595	-0.001	0.213	0.000
Entrepreneurial Self-Efficacy → Entrepreneurial Personality	21.445	0.001	-0.605	0.000

Table 6 - Path analysis results according to participant background

Path	p-Value									
	Gender		Expertise		Parental background			School status		
	M	F	TE	ICT	T	CS	PE	E	Public	Private
DL → EI	0.006	0.002	0.000	0.000	0.012	0.027	0.000	0.000	0.001	0.000
DL → EP	0.000	0.000	0.006	0.000	0.000	0.000	0.002	0.000	0.000	0.000
DL → ES	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI → EP	0.000	0.000	0.012	0.044	0.034	0.041	0.008	0.000	0.000	0.000
EI → ES	0.000	0.001	0.000	0.047	0.028	0.022	0.000	0.000	0.001	0.002
ES → EP	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000

See Table 5 above, digital literacy has a significant effect on interest in entrepreneurship with a *t* value of 91,919 and a significance of 0.000, so *H1* is supported. Likewise, digital literacy significantly affects entrepreneurial self-efficacy with a *t*-count value of 31.956 and a significance of 0.000, thus supporting *H2*. Then the interest in entrepreneurship also significantly affects self-efficacy with a *t*-value of 5.595 and a significance of 0.000, thus supporting *H3*. Digital literacy affects entrepreneurial personality with a *t*-value of 22,518 and a significance of 0.000, supporting *H4*. Self-efficacy significantly affects entrepreneurial personality, as evidenced by acquiring a *t*-count value of 21,445, so *H5* is supported. Likewise, interest in entrepreneurship significantly affects entrepreneurial personality with a *t*-value of 51.839 and a significance of 0.000, so *H6* is also supported. Then, as presented in table 6, the acquisition of *p*-values is below 0.050 at the 5% significance level ($p < 0.050$) in all lines analysed based on the participants' background. The results of this test certainly indicate that the influence between the variables that have been tested in their entirety (Table 5) applies thoroughly to each dimension of the participant's background. Both genders, the three areas of expertise, parents' work background, and school status turned out to have equally significant results.

4.4 Entrepreneurial Self-Efficacy Roles Test

The bootstrap method was used to test and analyse the significance of intervening variables' role in mediating the effects of exogenous variables on endogenous variables. Bootstrapping is used considering that research shows that bootstrapping is the most powerful and reasonable method for obtaining confidence limits for certain indirect effects in most conditions (Preacher & Hayes, 2008). Table 7 shows the role of entrepreneurial self-efficacy in mediating digital literacy and entrepreneurial interest in influencing vocational education students' entrepreneurial personality. The confidence interval obtained in this bootstrap method is 97.5%. The indirect effect of digital literacy on entrepreneurial personality through the mediation of entrepreneurial self-efficacy is obtained by a *t*-count value of 16.752 with a significance value of 0.000. Thus, it can be concluded that digital literacy has a significant indirect effect on entrepreneurial personality through the mediation of entrepreneurial self-efficacy, so *H7* is supported.

Furthermore, the same results were also obtained from the indirect effect of interest in entrepreneurship on entrepreneurial personality through the mediation of entrepreneurial self-efficacy with the acquisition of a *t*-value of 5.557 and a significance of 0.000, thus supporting *H8*. Then Table 8 shows the effect of the mediating role of entrepreneurial self-efficacy based on each dimension in the participant's background. Overall, it is explained that participants get a significant indirect effect in all dimensions in the background. There is only one path of indirect influence that is influential but not significant, namely the path of indirect influence of entrepreneurial interest on entrepreneurial personality in the dimension of expertise, specifically in the ICT category.

Table 7 - Mediating roles of entrepreneurial self-efficacy

Standardized	Analysis	Bootstrapping BC 95% CI					
		DL → EI	DL → EP	EI → EP	DL → ES	EI → ES	ES → EP
Direct effect	<i>t</i> -value	91.919	22.518	51.839	31.956	5.595	21.445
	Sig	0.000	0.000	0.000	0.000	0.000	0.000
Indirect effect	<i>t</i> -value		16.752	5.557			
	Sig		0.000	0.000			
Total effect	<i>t</i> -value	91.919	39.270	57.396	31.956	5.595	21.445
	Sig	0.000	0.000	0.000	0.000	0.000	0.000

Table 8 - Mediating roles of entrepreneurial self-efficacy according to participant background

Participant	<i>p</i> -Value Standardized with Bootstrapping BC 95% CI					
	Direct Effect		Indirect Effect		Total Effect	
	DL → EP	EI → EP	DL → EP	EI → EP	DL → EP	EI → EP
<i>M</i>	0.000	0.000	0.000	0.000	0.000	0.000
<i>F</i>	0.000	0.000	0.000	0.000	0.000	0.000
<i>TE</i>	0.006	0.012	0.028	0.043	0.025	0.000
<i>ICT</i>	0.000	0.044	0.000	0.054	0.000	0.048
<i>T</i>	0.000	0.034	0.000	0.000	0.000	0.000
<i>CS</i>	0.000	0.041	0.000	0.046	0.000	0.043
<i>PE</i>	0.002	0.008	0.014	0.031	0.013	0.027
<i>E</i>	0.000	0.000	0.000	0.000	0.000	0.000
Public school	0.000	0.000	0.000	0.000	0.000	0.000
Private school	0.000	0.000	0.000	0.000	0.000	0.000

5. Discussion

Printing prospective entrepreneurs through vocational education is considered one of the important assets in overcoming labour absorption in Indonesia (Ahmad, 2020; Zhang, 2019). New entrepreneurs are expected to reduce the problem of limited employment opportunities (Mei et al., 2020). However, other issues must also be considered, especially vocational education, to produce graduates ready to become entrepreneurs. Problems related to personality in entrepreneurship are important aspects that entrepreneurs must own. Previous research has revealed the importance of the entrepreneurial personality aspect in a person who can influence the smooth operation of his business (Ni & Ye, 2018). Personality will play an important role in a person, especially in reflection on important supporting characters for entrepreneurship (Anjum et al., 2021). In addition, a strong entrepreneurial personality will affect a person's readiness and decision making for entrepreneurship (Mei et al., 2020). Thus, vocational education needs to foster entrepreneurial personality in students as early as possible.

Vocational education which aims to prepare graduates to be ready to work and become entrepreneurs has attempted to grow an entrepreneurial personality, one of which is through entrepreneurship learning in it (Stadler & Smith, 2017). Through this learning, it is hoped that it will equip entrepreneurship skills to solve various problems in life (Hamburg, 2021). In addition, these efforts are also made to form the characters an entrepreneur needs in carrying out a business (Boldureanu et al., 2020). Entrepreneurship learning in vocational education also includes direct entrepreneurship practices, from planning, organizing, and implementing, to marketing. Thus, with the introduction, and provision of entrepreneurial competencies, to direct practice, the estuary of the entrepreneurial personality can grow optimally (Sawang, 2020; Stadler & Smith, 2017). However, other problems also arise which are proven by previous research. The study revealed that cultivating an entrepreneurial personality in students is a very difficult thing. Vocational education teachers reveal difficulties in forming strong personalities in students for entrepreneurship when they graduate (Sarwoko & Nurfarida, 2021; Sharahiley, 2020). Many students have a low mentality, especially in decision making, risk and capital in entrepreneurship (Ahmad et al., 2014; Pandit et al., 2018). This is also confirmed directly by students through previous research.

Sawang (2020) provide clear theoretical confirmation that cultivating entrepreneurial personality in students in education is difficult. Personality is not a simple thing but enters a high level because the presence of a personality which is a character will affect the extent to which a person has strong skills in entrepreneurship (Adiandari et al., 2019). In cultivating entrepreneurial personality in students, it is not enough just to organize entrepreneurship learning (Chien-Chi et al., 2020). Equipping the technological competencies currently needed to provide business efficiency and effectiveness will be very important. In the 21st century, it is known that the shift in technology toward digital has made it easier for humans to do various types of business (Mutohhari et al., 2021; Xu et al., 2018). Planning and processing of marketing can be done very easily and do not require a strategic place. Thus, these competencies are very important to form students' entrepreneurial personalities (Fellnhofner, 2021). Digital literacy becomes the foundation when someone wants to master digital technology comprehensively. Literacy will bring a comprehensive understanding for someone regarding the use and how to use it effectively and efficiently in entrepreneurship (Falloon, 2020; Secundo et al., 2020). Thus, digital literacy is one of the important aspects that must be provided by vocational education to students, so that an entrepreneurial personality can be formed. Similar research gives full support to this research which states that a comprehensive understanding of digital technology will provide a full picture of the ease and strategy in entrepreneurship so that the output will also shape the personality in entrepreneurship (Nambisan, 2017; Secundo et al., 2020).

In addition to growing digital literacy in students, teachers in vocational education must also start by cultivating an interest in students first. The growing interest in entrepreneurship in students is a good start for constructing further aspects to forming an entrepreneurial personality. According to (Luis-Rico et al., 2020), Interest in entrepreneurship is a basic aspect for prospective entrepreneurs. Without being based on a strong interest in entrepreneurs, a business will not run well (Luis-Rico et al., 2020). In addition, without interest, the goals and business orientation of a person will not be clear, as a result, failure in entrepreneurship will also be high (Luis-Rico et al., 2020). The results in this study indicate that interest has a high contribution to influencing entrepreneurial personality. These results are also strongly supported by previous research which revealed the significant interest in entrepreneurship in constructing an entrepreneurial personality because it is motivated to fulfil skills in entrepreneurship (Arafeh, 2015; Luis-Rico et al., 2020).

The growing interest in entrepreneurship and digital literacy does not necessarily directly affect the entrepreneurial personality. However, these aspects require aspects of support that can channel their influence on the growth and development of entrepreneurial personality. Entrepreneurial self-efficacy is an aspect that can be an intervening variable of these two aspects in mediating its influence on entrepreneurial personality indirectly and has been proven through previous research (Neneh, 2020; Rosique-Blasco et al., 2018). This study proves that entrepreneurial self-efficacy is a good mediator for digital literacy and entrepreneurial interest in influencing entrepreneurial personality indirectly. The strength of digital literacy and the growing interest in entrepreneurship as a basic capital will increase confidence in their ability to run a business in this digitalization era (Naushad & Malik, 2018). Thus, the estuary will indirectly foster an entrepreneurial personality in line with entrepreneurial efficacy due to the formation of digital literacy and the growth of interest in entrepreneurship. However, the results of the mediation analysis of entrepreneurial self-efficacy in this study showed a less significant figure on the indirect effect of interest in entrepreneurship on entrepreneurial personality in the sample of students in the field of ICT expertise. This is why the formation of an entrepreneurial personality is stimulated

directly if someone has a strong interest and has been supported by competent ICT competencies in supporting entrepreneurship. This also means that entrepreneurial interest that already has good ICT competence does not form entrepreneurial self-efficacy in terms of strengthening entrepreneurial personality (Nambisan, 2017; Nurtanto et al., 2022; Oggero et al., 2020).

Several previous studies also provided support for the results of this study. Previous relevant research provided direct analysis of the results of interviews in the field which revealed the formation of an entrepreneurial personality because students have had strong digital technology literacy for a long time (Oppong et al., 2020; Steyn, 2020). In addition, the teacher also provides survey data which explains that students who have always had a high interest in entrepreneurship are students who can form entrepreneurial personalities today (Schmitt-Rodermund, 2004; Setyaji et al., 2020). Other studies provide comprehensive results that entrepreneurial self-efficacy also shapes entrepreneurial personality. In addition, the nature of self-efficacy as an intervening also appears in mediating the influence of digital literacy and interest in entrepreneurship on entrepreneurial personality (Fuller et al., 2018; Wang et al., 2016).

Besides the importance of entrepreneurial personality, this study has several limitations beyond the researcher's predictions. A significant obstacle is the acquisition of respondents as research samples that are not optimal due to the situation and conditions of online learning during the COVID-19 pandemic. In addition, this research is only limited to the variables determined and published in this article after going through the relevant theoretical studies. Along with the development of science and technology, researchers hope that further research will continue to develop potential variables that are more effective in increasing the formation of entrepreneurial personalities in vocational education students.

6. Conclusion

The important role of vocational education in producing graduates who are ready for entrepreneurship through forming an entrepreneurial personality must receive support from the factors that influence it. This study confirms that digital literacy, interest in entrepreneurship, and entrepreneurial self-efficacy are important factors in shaping the entrepreneurial personality of vocational education students. Self-efficacy can also play a dual role in having a direct effect and being a good mediator for the indirect pathway of digital literacy and interest in entrepreneurship in influencing entrepreneurial personality. However, it is not significant in the analysis in the ICT sample. This finding strengthens the theory that, in addition to conducting entrepreneurial learning, vocational education must also focus on the characteristics and needs of students in constructing entrepreneurial personalities. Vocational education practitioners must cultivate digital literacy in students as early as possible and instill an interest in entrepreneurship in learning. Finally, the teacher must also strengthen entrepreneurship self-efficacy to form a strong entrepreneurial personality.

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