

Application Of Electronic Problem-Based Learning (E- PBL) During the COVID-19 Pandemic in Entrepreneurial Attitude

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Application Of Electronic Problem-Based Learning (E-PBL) During the COVID-19 Pandemic in Entrepreneurial Attitude*

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ABSTRACT

Purpose: The acceleration of the transformation of education and learning technology due to the COVID-19 pandemic has spawned various online learning program platforms to support and maintain the quality of graduates. The limitation of face-to-face meetings (offline) encourages many parties to develop models and applications of effective and efficient learning technology. One of them is implementing a learning model based on Electronic Problem Based Learning (E-PBL) in improving student's entrepreneurial attitudes in achieving learning competencies through web-based interactions between lecturers and students. **Method:** The research design uses a quantitative research approach with the use of E-PBL software on lecturers and lecturer students which aims to analyze the Electronic Problem Based Learning model by learning, learning motivation, and learning attitudes with a sample of 129 participants. Data was analyzed using Structural Equation Modeling (SEM) with SmartPLS 3.0 application.

Findings: A significant influence was found of the application of the E-PBL learning model on variables like learning, learning motivation, and learning attitudes **Implications for Research and Practice:** The application of the E-PBL learning model can improve learning methods, learning motivation, and positive learning attitudes that are effective and efficient for students during the COVID-19 pandemic.

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Introduction

During the implementation of the COVID-19 pandemic, everyone is required to wear a mask, wash hands, and maintain a physical distance. This is done to break the chain of the spread of the COVID-19 virus which is so deadly that it has affected all sectors of life, including education sector. In order to cope up with the crises created by the pandemic, it requires solutions for implementing practices of education management. The need is felt more because COVID-19 has changed the pattern of learning from face-to-face (offline) interaction between teachers and students to online (virtual) learning (Hikamah, 2021). The COVID-19 pandemic has also given rise to new ideas for scientists, researchers, lecturers, and students to try to conduct experiments to find innovations and creativity that can present an effective and efficient learning process so that they can carry out some interesting learning activity Zakaria et al., (2019) and McQuate, (2020). Additionally, it also requires a transformation and adaptation of various learning management activities (Haley et al., 2020; Pokhrel et al., 2021; Syakdiyah et al., 2021).

The education sector has faced a number of significant challenges and issues due to emergence of COVID-19. The class activities, teaching activities, social gathering for any purposes have been suspended, which has resulted in a negative impact on these activities. This has also necessitated an urgent quick shift to online method of conducted meetings for various purposes including teaching. The digital method of communication has taken place due to current scenario of pandemic and increased dependence on it. The international borders have been closed to control the movement of people and to reduce the rapid spread of virus, so international students are restricted to enter to the country for education purposes as well, this restriction of mobility has impacted the international travel for students for educational purposes (Brammer et al., 2020; Krishnamurthy, 2020). Hence, there is a need to minimize the damage to educational activities by making use of an entrepreneurial mindset.

The entrepreneurial mind set provides the right opportunity to be grabbed in such situations in order to compete in highly competitive environment. Moreover, due to pandemic intensity, competition has increased. The education sector needs to incorporate various entrepreneurial education methods to cope up with current situation, while considering that whether entrepreneurship can be taught, general consensus for education, regardless of personality traits that create beneficial outcomes. This leads towards the structure of entrepreneurship course, preferences towards learning and development of mind set, attitude and behavior towards initiative of business ventures (Winkler, 2020).

The entrepreneurial education incorporates the development of knowledge, skills and abilities to initiate the businesses for growth and profit. It has been observed that a large number of students get attracted towards seeking entrepreneurial education to shows tendency of entrepreneurial behavior. The students at higher education levels are more inclined towards acquiring entrepreneurial education for better future prospects, and a career that shapes their behavior towards business startups. The

students focus on number of future oriented possibilities for business startups including small businesses and corporate level ventures (Ratten et al., 2018). The quality of life, improved community serving and the knowledge about business activities including practical skills derived from entrepreneurial education, therefore it is more likely that an entrepreneurial attitude is developed in students as a result of the entrepreneurial education.

An entrepreneurial attitude is also often identified as a controlled mental attitude, which describes how learners control their thinking and behavior. In most countries, research and practice of entrepreneurship are community-oriented (Ratten et al., 2021); therefore various limitations are perceived in the educational process and learning of the entrepreneurship education, particularly in the COVID-19 situation. To overcome these limitations, a framework and curriculum are needed to enable the educators and learners to develop sufficient resistance and sustainability (Mann et al., 2021). Besides, it also needs a problem-solving approach compatible to challenges pertinent to the field of education and learning in the 21st century.

Such a problem solving approach ought to be multi-disciplinary and capable to develop critical thinking, collaboration, communication skills, adaptive curriculum, and have a potential for training and support for web-based learning (Arias Velásquez et al., 2021; Problems, n.d.). Web-based learning, if designed properly and appropriately, can be an interesting tool of learning. If it has a high element of interactivity, it would cause students to remember the subject matter better, and reduce operational costs that students usually spend to acquire learning. The role of educators is also expected to be significant in developing learning methods that can improve and develop critical thinking and independence in learning among students Ng et al., (2020) and Munawaroh. (2020). Any learning approach based on Problem Based Learning contributes a lot in improving knowledge in the field of learning (Miller et al., 2021).

One such challenge is to master the technological development and digitalization of educational tools. Not only to impart teaching and facilitate learning during the pandemic, electronics- based digital facilities have also facilitated the users to access the learning resources anytime, anyplace. One of the major advantages in current pandemic era is the utilization of academic resources becoming easier, more convenient and faster to organize and arrange the knowledge-based information due to digitalization and technological development (Chen et al., 2010; Xiang et al., 2021). The electronic access to information for users in organized and managed way is considered as a major advantage for both teachers and learners. It has resulted in continuous enrichment and structure of data, searches, annotation, filtering, dissemination and access, adding value to research in various fields of study and education (Chen et al., 2010; Marshall et al., 2006).

A greater challenge despite the accessibility of electronic resources and digitalization is the employability and entrepreneurial skills that must be aligned with job market. Any education acquired through an entrepreneurial attitude and

entrepreneurial intention equips graduates with not only the required skills but also coaches them to control the responsibilities at workplace (Burmeister et al., 2012). In such a scenario, the problem-based learning approach successfully contributes to skills development and increases the chances of employability. It has been widely accepted that only possessing the degree is not sufficient until having the particle skills to acquire the good position in the market (Venkatraman et al., 2018). Educational institutions therefore now focus to problem-based learning approaches to enrich the practical knowledge and ensure the employability of their graduates through skill development (Gartland et al., 2018). The relevant knowledge and skills development aiming to develop entrepreneurial attitudes and intention are ensured through the Technical and Vocational Education and Training (TVET) institutes that produce the real-world skills including critical thinking, communication, problem-solving and life-long learning. It is also ensured that graduates must be able to produce good quality outcomes with holistic balance global entrepreneurial perspective and lifelong learners (Jabarullah et al., 2019).

Previous literature shows that students trained with problem-based learning approach are found to be more inclined towards strategic and deep learning. It is also evident that active and experiential learning is found to be more constructive and effective than lecture-based passive learning (Jabarullah et al., 2019). It is also becoming evident that students are found to be more responsive to problem-based learning method as compare to traditional learning. The electronic- problem-based learning approach aims to equip the whole learning process with online methods. The current study aimed to study this electronic problem-based learning for entrepreneurial attitude among students in the light of restrictive situations caused by the pandemic.

This study aimed to examine the application of Electronic Problem Based Learning (E-PBL) methods in Jombang Indonesia. A learning method for students was developed in the form of a website application by the PGRI Jombang Indonesia School of Teacher Training and Education (STKIP). The application came out as an E-PBL learning software which aimed to manage information on learning activities. These activities involved interactions between lecturers and students in achieving learning objectives in entrepreneurship courses for students majoring in economic education. This application also made it easier for lecturers to provide assignments or information related to learning activities. It also made it easier for students to get information related to learning activities and also made it easier to collect assignments given by lecturers so that miscommunication could be avoided in learning activities. Based on the overview, this study attempted an analysis of the application of E-PBL software on learning methods, learning motivation, and student entrepreneurial attitudes during the COVID-19 pandemic.

1 Literature review

Electronic Problem-Based Learning

Electronic Problem-Based Learning is a type of learning activity that makes use of website media that is accessible via an internet network. Web-based learning is a type of electronic learning application which, if designed properly and appropriately, can be fun learning. It has a high element of interactivity, causes students to remember more subject matter, and reduces operational costs that students typically incur to participate in learning such as on snacks, transportation, notebooks, stationery, etc. In Electronic Problem-Based Learning, problems become the focus and stimulus, which guide the teacher to act as the facilitator. There can be five variations of problem in PBL approach: 1) Problem as a guide: The problem becomes a reference for students and they read the syllabus to follow the problem. It also helps to mold a student's mental framework and prepares him to work on assignments. 2) Problem as a unifier and an evaluator: The problem is presented after each lesson and assignments are given for explanations. This approach provides students with opportunities to apply their knowledge and solve problems. 3) Problem as an example: The Problem is used as an example and a part of the learning material. It aims to draw on theories, concepts, or principles and for students and teachers to discuss the problem in its context. 4) Problem facilitates the learning process: The problem is used as a tool to train students and the students and teacher must discuss it together. 5) Problem stimulates learning: The problem stimulates students' skills to collect and analyze data related to problems and skills (Arias Velásquez et al., 2021).

A number of learning opportunities have been created through the problem-solving teaching strategy the collaborate the interactive applications to introduce the real-life problems to be solved. For example, with the help of problem-solving teaching strategy, learners develop critical and analytical skills while the teachers develop a seamless approach to integrate information retrieval for various educational purposes. The budding entrepreneurs are able to learn from real-life cases (Smith Macklin, 2001) since technological advancement facilitates business development. It is also helpful for the entrepreneur to grab the opportunities for massive gain, taking advantage of structural and economical changes that are taking place in the industry (Kleis et al., 2012). Such opportunities also help entrepreneurs to establish new practices and provide social and economic benefits to people. These newly established practices act as information processing tools, give them an advantage over the market, as they develop their capabilities and skills (Tajvidi et al., 2020). This study is an attempt to study all such practices and examine the extent to which electronic problem-solving learning and entrepreneurial attitudes are related in the Indonesian context.

Hence, on the basis of the review, the following hypothesis is framed:

H1: Electronic Problem-solving learning techniques influence the entrepreneurial attitudes of the University students of Indonesia

Learning Method

Sahidin (2013) defines learning method as the ability to carry out one's effort to obtain a change in new behavior. When applied, a learning method results in an experience which can be termed as the product of an interaction with the environment. A learning method also means the ability to move or act with variation (Oiliff et al. 2020). Hence, when a learning method is applied to education or studying a subject, it must result in a changed behavior, a product of one's interaction with the learning environment. A learning method also shows an understanding of attention or interest from the processes carried out during the learning process (Robotham et al., 2011). A learning method proves to be a complex pattern of characteristics in which the whole is greater than its parts. It can relate to the general tendency towards a particular/specific learning approach shown by an individual to carry out his/her effort to obtain a new change of behavior as a whole. This phenomenon is also seen as a product of the learners' interaction with the environment.

Learning methods have recently been changed due to the pandemic situation all over the world. Educational institutions have adopted newly established platforms for providing education and electronic educational resources. Their relationship has been depicted in a number of previous studies (Fayolle et al., 2005; Varela et al., 2001). These studies have uniquely pointed out how new learning methods with entrepreneurial intent has initiated innovative solutions. These studies have examined how new learning methods revolutionized business planning, business activities, student orientations, teaching and feedback processes efficiently highlighting entrepreneurial attitude building in the participants (Mueller, 2011). A few of these studies have also examined the relationship between experiential learning and entrepreneurial intention at higher education levels, where empirical learning, cognitive loading and self-efficacy are found to be influential towards the entrepreneurial intention (Anwar et al., 2021).

Another study conducted a survey on entrepreneurial attitude in societal perspective to examine the abilities needed to solve the issues and problems of the environment and society. In a sample drawn from Spanish universities, the study raised environmental issues amidst the global pandemic crisis. The research addressed the relationship between social entrepreneurship attitude and entrepreneurial intention (Ruiz-Rosa et al., 2020). The results revealed that entrepreneurial intention decreases due to socioeconomic crisis and higher uncertainty. The study also found that social entrepreneurship attitude significantly influences any entrepreneurial intention and determines further perceived behavioral control. There is a lack of empirical evidences in assessing the relationship between learning methods and entrepreneurial attitude pertinent to COVID-19. The current research bridges the theoretical gap by empirically examining the relationship between learning methods and entrepreneurial attitude among students of Indonesian universities. Based on above literature review the following hypothesis is derived:

H2: The Learning Methods influence the entrepreneurial attitude among the University students of Indonesia

Learning Motivation

Motivation can be defined as a state of mind when a person is engaged in certain activities that help him/her to achieve the desired results "Motivation is the extent to which you make choices about (a) goals to pursue and (b) the effort you would put into the pursuit" (Brown et al., 2020). In a learning or educational environment, motivation is positively related to the achievement and various dimensions of personal and universal competence (Cao & Meng, 2020) or achieving proficiency in foreign language learning (Hu et al., 2020). There is no dearth of research dealing with motivational factors in learning related to teaching strategies or students' achievement motivation. Positive interactions of a learning experience strengthens motivation and inspires participants to react to environmental challenges (Wen et al., 2020). For instance, if a learner wishes to learn complex subjects like Computer Assisted Language Learning (CALL) or a second-language (L2) learning, motivation can contribute significantly in achieving the learning goals. However, success in learning greatly depends on the type of motivation each student develops in him, intrinsic or extrinsic. It also depends upon the quality of the teacher's assistance, and how effective and entertaining the teaching strategies have been during the learning process (Escobar Fandiño et al., 2019).

A recent study examined the entrepreneurial attitude of students of South African universities and found that economic development is a product of entrepreneurial activities. The study reported that there exists a relationship between entrepreneurial education and motivation for entrepreneurial activities among students. The study further investigated the relevance and adequacy of course content of university entrepreneurship education to determine the extent to which competences are built up among students (Iwu et al., 2021). Likewise, a similar study measured the entrepreneurial attitude of students influenced by learning motivation and attitude, innovativeness and self-efficacy. The study argued that the entrepreneurial intention was based on four attitudinal antecedents including learning motivation, innovativeness, attitude towards entrepreneurship and self-efficacy. The results of the study revealed that learning motivation and attitude towards entrepreneurship significantly influenced the entrepreneurial intention, but no significant relationship was observed between innovativeness and entrepreneurial intention and between self-efficacy and entrepreneurial intention (Law et al., 2017). The study of (Zvarikova et al., 2017) highlighted important predictors of entrepreneurial intention among university students such as social environment, business support, macroeconomic environment, quality of business environment, financial resources, quality of higher education, student personal qualities, business benefits and disadvantages of business. This study reported that these factors were important in assessing the entrepreneurial attitude among students of universities. The study of (Şahin et al., 2019) focused on big five personality traits that influenced the entrepreneurial attitude among students of universities in Turkey. The study reported that personality traits influenced the

entrepreneurial attitude significantly. Moreover, the entrepreneurial attitude was influenced by entrepreneurial education and entrepreneurial motivation. The results of the study revealed that entrepreneurial attitude was influenced significantly by entrepreneurial motivation. However, in another study of similar nature, entrepreneurial education was found to be insignificant in predicting the entrepreneurial attitude (Mahendra et al., 2017).

The current research aimed to explain the relationship between learning motivation and entrepreneurial attitude among students of universities in Indonesia. As mentioned above, a number of variables have been tested in previous research studies explaining various phenomena of entrepreneurial education. However, there is a scarcity of empirical evidence that could predict the relationship between learning motivation and entrepreneurial attitude during the pandemic era. With this aim to determine the relationship between learning motivation and entrepreneurial attitude among students of universities in Indonesia, this study framed the following hypothesis:

H3: Learning motivation influences the entrepreneurial attitude among the University students of Indonesia

Entrepreneurial Attitudes

An entrepreneurial attitude is defined as a controlled mental attitude or frame of mind that makes learners control the way they learn, think, and behave. For an entrepreneurial attitude, the most important thing is to develop a self-belief, a trust that what you are doing will bring success prosperity in future. The current pandemic situation requires distinctively different and innovative ideas to be survived in the industry and the incorporation of degree of innovation and personal control on specific situation is the basis of entrepreneurial attitude. The change in existing practices to conduct the business activities implies towards the abilities of an individual to change the course of action for self-esteem and need for achievement (Brown et al., 2020; Rauch et al., 2015). The current decade has observed the increased number of individuals that attracted towards entrepreneurial education as compared to previous decade. The enrollment in entrepreneurial courses has increased which reflects the importance of entrepreneurship education. Statistics reveals that more than 50% students of entrepreneurship education intend to setup their own businesses after completing education as a large number of students after studying entrepreneurship have found to be more positive towards businesses startups (Kubberød et al., 2017; Santos et al., 2019; Zhang et al., 2017). The entrepreneurial education has become complex due to enrichment of topics related to creativity, thinking and doing new things after graduation in real world business scenario. The teaching methods and pedagogical approaches have further altered the methods of managing the expectations, strengths and abilities of students (Ahmed et al., 2020). The entrepreneurial curriculum also now includes such modules that enrich students' abilities and develop their problem-solving skills, to resolve real world business issues and challenges, and most importantly to develop their decision-making skills towards

solving societal issues by focusing on entrepreneurial solutions. These skills help young entrepreneurs to initiate their business ventures and the entrepreneurial principles empower them to take strategic problem solving initiatives and business decisions (Elliott et al., 2020). The entrepreneurial education enables individuals to develop entrepreneurial behavior and attitudes focusing on problems related to business activities on decline due to the COVID-19 situation. The entrepreneurial education has also gained importance due to the innovative ideas that students learn from business survival (Beech et al., 2020; Duval-Couetil et al., 2021). Entrepreneurial behavior patterns gained through such interventions can be listed as under: 1) personality: which comprises creativity, self-discipline, self-confidence, the courage to take risk, and having a drive and a strong will; 2) personal relationship skills, which includes good communication, leadership, and management skills in interpersonal relationships; 3) marketing: comprises the ability to determine products and prices as well as advertising and promotion; 4) expertise in regulating: comprises business operations involving goal setting, planning, and scheduling, as well as personal arrangements; 5) finance: which includes the attitude towards finance and how to manage it.

Prior studies have therefore stated a number of influential factors that predict the entrepreneurial attitude and suggested models and predictors to mitigate various issues and problems related to learning methods and learning motivation. In the absence of such models and predictors, it is hard to observe the behavior of an individual due to changing characteristics (Krueger et al., 2000). However, intention-based frameworks have found to be much more reliable in predicting the behavior of individuals. In the current context, the theory of planned behavior is considered as one of the most powerful models to determine entrepreneurial intention, attitudes and behavior. The theory has been applied to number of research frameworks and found to be supportive for empirical evidences. Fishbein et al. (1980) stated that entrepreneurial attitude can be easily measured by the amount of learning motivation and entrepreneurial intention, thus evolving a pattern with these three antecedents. The three antecedents of entrepreneurial attitude, learning motivation and entrepreneurial intention also relate to the perception of the individual that perform the behavior. Collectively, these factors together construct a reality (Ajzen, 2002). For the current study, therefore, a framework was underpinned based on the theory of planned behavior, as electronic problem-based learning influences both the learning method and learning motivation.

Research Method

Research Design

The current research incorporated a quantitative research design to examine the relationship between the constructs of the framework. The exogenous constructs included electronic problem-based learning, learning methods and learning motivation, while the endogenous construct in the current study was entrepreneurial attitude. The prime purpose of the current study was to determine the entrepreneurial

attitude of Indonesian university graduates influenced by electronic problem-based learning, learning methods, and learning motivation during the current pandemic situation, which had compelled the education industry globally to alter the traditional teaching methods.

The data was collected through a questionnaire based on predetermined measurement scales developed by previous research gurus and various times utilized by remarkable research studies. The technique utilized in the current research study was the cross-sectional survey of students from different universities in Indonesia. The research objective was to analyze the relationship between the variables as they have gained enough attention during pandemic era or when physical interaction was restricted by the government to prevent the rapid spread of coronavirus. The questionnaire included the demographic variables including age, gender, and academic level. The research framework is presented in Figure 1 that shows the hypothesized relationships examined in this study.

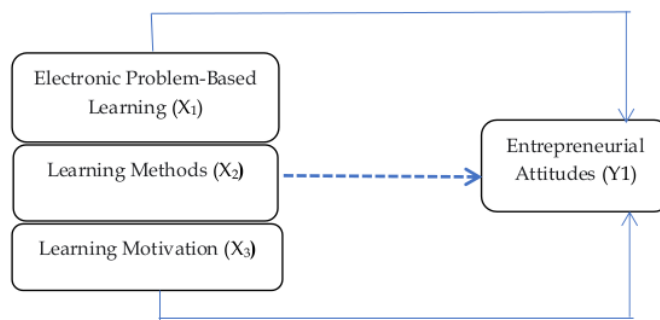


Figure 1. Application Of Electronic Problem-Based Learning (E-PBL) and its variables on Entrepreneurial Attitudes

- X₁ : Electronic Problem-Based Learning
- X₂ : Learning Methods
- X₃ : Learning Motivation
- Y : Entrepreneurial Attitudes

Research Sample

An important phase of a research study is to identify the accurate and current population and to draw an appropriate sample to conduct research cross-sectionally. The questionnaire was sent through email to the participants. Their consent was taken prior to participation and their willingness to share the information they possess. The

Department of Economics was selected for draw the sample because it was closely related to the context of study. Fresh economics graduates after completing their studies often get interested in entrepreneurship and develop a high level of entrepreneurial intention and entrepreneurial attitude.

The population of this research comprised the Universities in the province of Malang of East Java, Indonesia. The convenience sample technique was used to identify the sample as due to the pandemic situation; the whole country was under lockdown and physical interaction was strictly prohibited. The convenience sampling technique was considered most appropriate sampling technique in restrictive situations (Sekaran et al., 2019). A total of 236 students of Department of Economics of different Indonesian universities responded to the consent request sent, out of which a sample of 129 students was chosen who belonged to the academic years of 2017, 2018, and 2019. The data collection focused on the analysis of the relationship and the phenomenon of entrepreneurial attitude, learning methods and learning motivation.

Research Instruments and Procedures

The questionnaire used to collect data was administered with the assistance of the google form application. There were 78 items in the questionnaire: consisting of 20 E-PBL questions, 20 questions on learning methods, 16 questions on learning motivation, and 22 questions on entrepreneurial attitudes. The validity and reliability of the questionnaire was carried out on a different sample of 30 respondents, using the Cronbach's Alpha Composite Reliability and Average Variance Extracted (AVE).

Data Analysis

Structural Equation Modeling (SEM) and SmartPLS 3.0 was used for data analysis (Ramayah T. et al, 2018). The purpose was to find out whether there was any relationship between variables – Electronic Problem-Based Learning (X1), learning methods (X2), learning motivation (X3), and entrepreneurial learning attitudes (Y1). The conditions for accepting the hypotheses were deemed to be significant if the p-value was < 0.05 . The E-PBL model fit requirement (goodness of fit) would be accepted if the Average Full Collinearity (VIF) value for all variables was < 5 and ideally < 3 .

Results

Table 1 summarizes the results of the validity and reliability test of the E-PBL instruments in terms of Cronbach's Alpha, Rho, and Composite Reliability values. All values are showing above 0.70, which indicates that the research instrument was reliable. The value of Average Variance Extracted (AVE) was above 0.6, which indicates that the instrument has met discriminant validity. The conclusion of the research instrument was thus valid and reliable as was suitable to measures all the four variables of this study.

Table 1

Validity and Reliability of E-PBL Instruments on Learning Methods, Learning Motivation, and Entrepreneurial Attitudes

	Cronbach's Alpha	Rho. A	Composite Reliability	Average Variance Extracted (AVE)
Learning Methods	0.878	0.867	0.815	0.823
Entrepreneurial Attitudes	0.889	0.878	0.875	0.823
Learning Motivation	0.800	0.850	0.834	0.800
E-Problem Based Learning	0.898	0.873	0.845	0.843

Table 2 presents the results of the Collinearity Statistics Average Full Collinearity test value (VIF), which measures = 1 for all variables, with terms acceptable if ≤ 5 , ideally ≤ 3 . This indicates that the E-Problem Based learning model used in this study was either good or ideal.

Table 2

Collinearity Statistics (VIF) E-PBL on Learning Methods, Learning Motivation, and Learning Attitudes

	Inner VIF Values
Learning Methods (X2)	1.000
Entrepreneurial Attitudes (Y1)	1.000
Learning Motivation (X3)	1.000
E-Problem Based Learning (X1)	1.000

The results of the test of the direct influence variable in Table 3 shows that there was a significant effect of using the E-Problem Based Learning model on learning methods (X2), showing the value of 0.19, on learning motivation (X3), showing value of 0.031, and on Entrepreneurial attitudes (Y1), showing a value of 0.310. this suggests that E-PBL can potentially improve learning ability up to 19.9%, learning motivation to the extent of 3.1%, and entrepreneurial attitude also up to the level of 31% in students; while it was seen that the learning methods (X2) affected learning motivation with 0.265 value and Entrepreneurial attitudes of 0.169 (Y1). These findings reveal that all three hypotheses of the study were acceptable.

Table 3

Direct Effect of E-PBL on Learning Methods, Learning Motivation, and Entrepreneurial Attitudes

	Learning Methods	Entrepreneurial Attitudes	Learning Motivation
Learning Methods	0.290	0.269	0.265
Entrepreneurial Attitudes	0.210	0.310	0.200
Learning Motivation	0.259	0.310	0.250
E-Problem Based Learning	0.210	0.310	0.231

Discussion, Conclusion, Recommendations

The Problem-Based Learning application is a strategy to improve the quality of learning, critical thinking, and learning outcomes, when each of them is influenced by environmental conditions (Kassymova et al., 2020; Lopes et al., 2020; Ramadhani et al., 2019). The limitation on face-to-face learning during the COVID-19 pandemic hampered students' learning activities (Ratten et al., 2021). It was an urgent need to devise an innovative learning model for the application of electronic - problem-based learning in order to maintain the continuity of quality and entrepreneurial learning activities for students. This study was based on the premise that the impact of COVID-19 on entrepreneurship education can also affect entrepreneurial activity. It can also influence the learning motivation that is needed to keep the independent entrepreneurial spirit alive, particularly during the periods of crises. A major requirement was to find an effective learning technology that might focus on competence and efficiency, as a productive solution (Ratten et al., 2021).

A course on entrepreneurship requires good cooperation between students and teachers. The goal of entrepreneurship learning should be to prepare students strong enough to analyze and solve real and concrete problems through lessons learnt in the class, and through the learning material provided by the teacher. Students need to acquire both soft and hard skills, in order to acquire the knowledge of the concepts and principles of entrepreneurship, and at the same time to develop the skills required to apply that knowledge in everyday life. The findings reveal a significant effect of the application E-PBL on entrepreneurship attitudes, a value of 0.031, suggesting that E-PBL can increase the positive attitude of learning entrepreneurship by 31%. This also leads to infer that the application of E-PBL can improve critical thinking and communication between teachers and student in achieving learning competence in entrepreneurship courses (Problems, n.d.). The findings of this study are supported by Merrill Pysicall (1995) who reported similar results showing the success of technology-based PBL, which developed a positive attitude, increased awareness of difference of opinion, and increased the ability to solve problems. This also leads to infer that if a prospective entrepreneur develops a strong attitude and belief about success coming their way, it will definitely happen.

The role of teachers is very essential for applying the learning model independently and developing an entrepreneurial spirit. The success of entrepreneurship education and learning lies in the skills of teachers that they utilize in the learning process. By making use of the E-PBL application, teachers can motivate students to cultivate a sense of enthusiasm and an unyielding attitude in the face of failure while undertaking business ventures. Various developments in PBL learning models have turned out to have positive implications during the COVID-19 pandemic, particularly in imparting entrepreneurship education. This is possible in both research and practice as well as in improving problem-solving skills and creativity even in complex courses like mathematics and biology (Suparman et al., 2021; Yani et al., 2021; Maskur, 2020). Research has also proved that when creativity is applied in PBL learning models by making use of comics in mathematics, it can increase students' understanding in an easy and interesting way, while doing interaction with teachers at the same time outside the classroom (High, 2020; Pohan & Menanti, n.d.)

The right learning method also greatly affects students' learning motivation, as identified in the value = 0.265 (Table 3). This suggests that appropriate learning method can increase students' learning motivation by 26.5%. Furthermore, learning methods and learning motivation also affect students' learning attitudes. In responding to the COVID-19 pandemic, it is necessary to support learning technology and administrative systems to facilitate communication between teachers and students, which is possible only through the right learning method (Lockee, 2021). Likewise, during the COVID-19 pandemic, alternative learning approaches were also carried out to manage the clinical practice of prospective doctors through simulations for both outpatients and inpatients and accomplish the expected learning objectives with the principle of maintaining health protocols at the same time (Treatment, 2013).

In the relationship measured in this study between the four variables of the E-PBL learning model, it was observed that the relationship was ideal and met the Collinearity Statistics (VIF) $1,000 < 3$. There was also a simultaneous influence and relationship between the E-Problem-Based Learning (X1), learning methods (X2), and learning motivation (X3) on entrepreneurial attitudes (Y1) with R square > 0.2 which suggests that E-PBL, learning methods, and learning motivation in students can increase students' positive attitude towards entrepreneurship in a **5** situations (Table 3). It cannot be denied that the E-PBL model can shape students to **work on authentic problems with the intention of compiling their own knowledge, developing inquiry and higher-order thinking skills, developing independence and self-confidence**. This finding is supported **5** by previous research. These studies too show that the benefits of E-PBL for students **have an influence on student learning outcomes**.

The learning process of a teacher with the PBL model in various groups of students greatly affects how to learn effectively, efficiently and can increase learning motivation which in turn can increase the positive attitude of entrepreneurial students. A positive learning attitude will underlie one's behavior in entrepreneurship. Therefore, the use of the Problem Based Learning model in this study has a positive impact on students' entrepreneurial attitudes. A significant effect was measured in the use of the E-PBL

application on learning method, learning motivation, and entrepreneurship attitude= p-value of 0.000 (highly significant) with R Square = 0.208. This suggests that E-PBL Learning Model can increase the positive attitude of student entrepreneurship learning by 20.8%. The positive attitude of learning in students is also expected to be able to improve the quality of learning and graduates in the era of the COVID-19 pandemic. The study recommends to use the PBL model for knowing a student's learning methods and a student's learning motivation in the hope that PBL model can be optimally used to make the learning process more effective and efficient (Mahendra et al., 2017).

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