Mathematics study habits through an ethnomathematics approach and entrepreneurial behavior of mathematics education students

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Abstract: This research aims to determine whether there is a positive correlation between mathematics learning habits through an ethnomathematics approach and entrepreneurial behavior. This research is survey research conducted by mathematics education students in Bengkulu and Lubuklinggau. The sample for this research consisted of 70 students. There are two questionnaires as research instruments. Both are a questionnaire on mathematics learning habits using an ethnomathematics approach, and an entrepreneurial behavior questionnaire. The result of this research is that the complete structural equation model fit test is a good fit, which means that the empirical structural equation model is suitable with the theoretical (conceptual) structural equation model. The results of the hypothesis test show that the calculated t value is 11.364 > 1.96, which means Ho is rejected, meaning that this research hypothesis is accepted. The conclusion is a positive correlation between mathematics learning habits through an ethnomathematics approach and entrepreneurial behavior.

Keywords: Mathematics Study Habits, Ethnomathematics, Entrepreneurial Behavior.


INTRODUCTION

Entrepreneurial behavior is an important action to improve a person’s standard of living. In doing entrepreneurship, a creative process is needed, with something different as a form of innovation. This is useful for providing added value to entrepreneurship (Suharyono, 2017). Many universities consistently develop student entrepreneurship. This has been able to foster student behavior to try entrepreneurship. Even though the business journey experienced problems, it was difficult to develop, and experienced business sustainability problems (Iskandar & Mulyati, 2019). The obstacles felt by students in entrepreneurship are problems originating from internal sources and external problems (Iskandar & Mulyati, 2019). Internal problems...
include lack of time, low product competence, marketing incompetence, and negotiation skills. Meanwhile, problems originating from external sources include the absence/lack of business capital, the absence of mentors, and the absence of facilities intended for novice entrepreneurs.

Learning is an effort by each individual to make changes in behavior. Individuals strive to change to be better at meeting their needs. This can be done through entrepreneurial behavior. Entrepreneurship is a spirit, behavior, and ability to provide a positive response to opportunities to gain profit. Good and correct mathematics learning habits trigger entrepreneurial behavior so that they are skilled in directly practicing the learning process and results (Putra, 2021). Therefore, elements of entrepreneurship are important and need to be applied to students who are teaching and learning mathematics (Mahmud et al., 2022). Also, efforts need to be made to foster an entrepreneurial mindset in the younger generation through education at all levels, namely primary and secondary schools, vocational secondary education, and higher education (European Commission, 2006).

Data shows that many college graduates are unemployed. According to Wiyono and Wu (2022), two soft skills must be taught so that graduates are successful at work. It is leadership and an entrepreneurial spirit. Therefore, college graduates must have an entrepreneurial spirit and behavior. Based on the European Commission (2006), an entrepreneurial strategy through learning mathematics is a strategy to strengthen an individual's ability to see and exploit opportunities in economic, social, and cultural contexts (such as mathematics in culture, often called ethnomathematics). This paves the way for entrepreneurship, innovation, and future reorientation across the archipelago.

Entrepreneurial behavior can be carried out through internalization in life, and learning at school. According to Masduki and Kurniasih (2019), mathematics-based entrepreneurial learning can be a solution to instilling entrepreneurial character in students through mathematics learning. Learning mathematics indirectly has entrepreneurial values, one example of which is arithmetic material which can introduce students to the principles of buying and selling, profit and loss. This can become a habit of learning mathematics in everyday life. The habit of studying mathematics as an effort to motivate yourself to excel. Achievement motivation has a strong influence on the entrepreneurial spirit (Wiyono & Wu, 2022). Therefore, increasing positive study habits needs to be carried out to increase achievement motivation which then has a positive effect on students' entrepreneurial spirit. It all influences entrepreneurial behavior. Mathematics learning habits through a local cultural approach are closely related to entrepreneurial behavior (Summer, 2019). Summer (2019) stated that financial education is very important and urgent. One of the entrepreneurial behaviors is carried out through developing the ability to assess the influence of advertising, to obtain information about the possibility of saving money, the emergence of money and the money cycle, to obtain the ability to assess the ecological and social consequences and of course the mathematical possibilities of handling money and its critical impact. Thus, learning habits through local cultural approaches such as ethnomathematics are positively related to entrepreneurial behavior.
Gularso’s (2023) research results show that entrepreneurship in the education sector can increase the added value of a product/service in professions operating in the education sector. Learning about entrepreneurial behavior in schools provides students with learning experiences according to their interests and talents, according to the concept of independent learning and collaboration with technology, and according to the demands of today’s times in line with the demands of Society 5.0. The results of other research show that there is a positive relationship between participation in entrepreneurship education and mathematics ability. Also, there is a positive relationship between entrepreneurial education ability and mathematics ability (Abdelhamid, 2022). Thus, entrepreneurial education ability is positively related to mathematics ability.

Study habits are a student’s behavior that is carried out repeatedly in the learning process and completing learning tasks. According to (Rohman MS, 2012), a study habit is a behavior that is formed because it is done repeatedly, and has a certain pattern. These are the learning actions most often carried out by students which are formed from their learning activities (Andhini, 2017). In learning mathematics, there is a habit of students learning through a local cultural approach (Herawaty et al., 2018). It is like the metacognition process of students in solving mathematical problems based on traditional housing ethnomathematics in Rejang Lebong. The mathematical understanding of students who study ethnomathematics-oriented material is higher than students who study non-ethnomathematics material (Widada et al., 2018). Playing dakon has become a local culture in Bengkulu. Since I was in kindergarten, dakon has been a fun game. It has the characteristic of dividing the fruit on each dakon which is convex (or hollow). This is the starting point for learning multiplication and division. Students can develop an understanding of multiplication and division operations, including verbal communication, writing and drawing based on real media from local culture, namely the dakon game (Widada et al., 2020). Therefore, the habit of learning mathematics through a local cultural approach (ethnomathematics) has a positive impact on students’ mathematical abilities. Thus, the habit of learning mathematics using an ethnomathematics approach is a mathematics learning activity that becomes a habit with the starting point of local culture as measured through indicators: having the habit of understanding local culture (X1), having the habit of making mathematical models based on local culture (X2), have the habit of completing mathematical models created (X3), and have the habit of compiling mathematical concepts/principles based on solving mathematical models (X4). The relationship diagram between the latent variable Mathematics Learning Habits through the Ethnomathematics Approach (KBM) and the indicator variables is shown in Figure 1.

**Figure 1. Conceptual model of the relationship between KBM variables and their indicators**

Entrepreneurial behavior education through mathematics learning habits includes interconnected elements, namely thinking power, skills, mental attitude, and prediction, anticipation, or intuition (Masduki & Kurniasih, 2019). Entrepreneurial behavior is an action to achieve
a certain goal through taking initiative, innovating, and taking calculated risks: entrepreneurs take risks that can be managed, the need for achievement: entrepreneurs are driven by the need to achieve goals and self-confidence, namely entrepreneurs believe in their abilities (Susilo, 2014; Adirakasiwi et al. 2021; Nursiah et al., 2017). Therefore, entrepreneurial behavior is defined as an entrepreneurial action that is measured through the indicators: taking the initiative to become an entrepreneur (Y1); innovating to develop business (Y2); dare to take calculated risks to develop entrepreneurship (Y3); feel the need to achieve (Y4); and have self-confidence in every entrepreneurial activity (Y5). Thus, the relationship diagram between the latent variable Entrepreneurial Behavior (PWU) and the indicator variables is as shown in Figure 2.

Figure 2. Conceptual model of the relationship between PWU variables and their indicators

Based on the research results of Gularso (2023); Susilo, 2014; Adirakasiwi(2021); Nursiah et al. (2017); Summer (2019) states that learning habits are correlated with entrepreneurial behavior. Therefore, there is a big tendency that the habit of learning mathematics through an ethnomathematics approach is positively correlated with entrepreneurial behavior. Thus, this study discusses the research problem: "Are mathematics learning habits through an ethnomathematics approach positively correlated with entrepreneurial behavior?"

METHODS

To determine empirical conclusions we conducted survey research. The sample was randomly selected from as many as 70 students, from all Education students in Mathematics in the Bengkulu and Lubuklinggau its population. There are two latent variables, namely habits Study mathematics through approach ethnomathematics (KBM), and behavior entrepreneurship (PWU). The research instrument is a fruit questionnaire. That is the habits questionnaire Study mathematics through approach ethnomathematics and questionnaires behavior entrepreneurship. Both of them have a valid and reliable standard, with Cronbach’s alphas of 0.87 and 0.85 respectively (Dynawati et al., 2023; Hidayati et al., 2022; Efriyani, 2023). Technique data collection is carried out via Google Forms online. Data were analyzed using Structural Equation Modeling with the help application Lisrel 8.8.

RESULTS AND DISCUSSION

Results

The results of this research data analysis begin by determining the level of reliability and validity, and the structural equation model builds a relationship diagram between latent
variables, indicator variables and represents unexplained variants. Based on the Lisrel 8.8 output, a complete structural equation model fit test is presented in Table 1.

Table 1. Overall Model Fit Test Results

<table>
<thead>
<tr>
<th>Whole</th>
<th>Benchmark Values for Model Fit</th>
<th>Fit the Model to the Data Epic</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2_{hitung}$ = 16,76</td>
<td>P-value $\geq$ 0,05</td>
<td>Good Fit</td>
</tr>
<tr>
<td>P-value = 0,337</td>
<td>RMSEA = 0,063</td>
<td>$\leq$ 0,08</td>
</tr>
<tr>
<td>NFI = 0,90</td>
<td>$\geq$ 0,90</td>
<td>Good Fit</td>
</tr>
<tr>
<td>NNFI = 0,92</td>
<td>$\geq$ 0,90</td>
<td>Good Fit</td>
</tr>
<tr>
<td>CFI = 0,91</td>
<td>$\geq$ 0,90</td>
<td>Good Fit</td>
</tr>
<tr>
<td>IFI = 0,90</td>
<td>$\geq$ 0,90</td>
<td>Good Fit</td>
</tr>
<tr>
<td>RFI = 0,93</td>
<td>$\geq$ 0,90</td>
<td>Good Fit</td>
</tr>
<tr>
<td>RMR = 0,045</td>
<td>$\leq$ 0,05</td>
<td>Good Fit</td>
</tr>
<tr>
<td>SRMR = 0,047</td>
<td>$\leq$ 0,05</td>
<td>Good Fit</td>
</tr>
<tr>
<td>GFI = 0,91</td>
<td>$\geq$ 0,90</td>
<td>Good Fit</td>
</tr>
</tbody>
</table>

Based on Table 1, the complete structural equation model fit test is a good fit. This means that the structural equation model is empirical between KBM variables and The PWU variable is a good fit to the theoretical (conceptual) structural equation model.

Next, the results of data analysis are presented in Figure 3 and Figure 4. That is a connection between structural mathematics learning habits with an ethnomathematics approach with indicator $r$ - indicator ie have the habit of understanding local culture (X1), have the habit of making mathematical models based on local culture (X2), have the habit of completing the mathematical models created (X3), and have the habit of compiling mathematical concepts/principles based on solving mathematical models (X4). Also, relationships structural entrepreneurial behavior with indicators that taking the initiative to become an entrepreneur (Y1); innovating to develop business (Y2); daring to take calculated risks to develop entrepreneurship (Y3); feeling the need to achieve (Y4); and have self-confidence in every entrepreneurial activity (Y5). Figure 3 is a Confirmatory Factor Analysis (CFA) diagram for the Basic Model Standardized Solution, and Figure 4 is a CFA diagram for the Basic Model T-Values.
The diagrams in Figure 3 and Figure 4 are used to test the validity of each indicator variable and the reliability of the instrument. Meanwhile, the t value in the path diagram between latent variables is used to determine the significance of the direct and indirect influence between these latent variables. This is a statistical hypothesis test.

We have calculated the validity of each indicator variable and the reliability of each latent variable based on the Basic Model Standardized Solution and Basic T-Values Model (Figures 3 and 4). We have summarized these calculations in Table 2 (Validity & Reliability of KBM) and Table 3 (Validity & Reliability of PWU).

**Table 2. Validity & Reliability of KBM**

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Standardized Loading Factors (SLF) ≥ 0.50</th>
<th>Standard Errors</th>
<th>t-value &gt; 1.96</th>
<th>declaration</th>
<th>Construct Reliability (CR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>0.586</td>
<td>0.656</td>
<td>4.816</td>
<td>Good validity</td>
<td></td>
</tr>
<tr>
<td>X2</td>
<td>0.538</td>
<td>0.711</td>
<td>4.369</td>
<td>Good validity</td>
<td></td>
</tr>
<tr>
<td>X3</td>
<td>0.588</td>
<td>0.654</td>
<td>4.836</td>
<td>Good validity</td>
<td></td>
</tr>
<tr>
<td>X4</td>
<td>0.463</td>
<td>0.786</td>
<td>3.697</td>
<td>Good validity</td>
<td></td>
</tr>
<tr>
<td>X5</td>
<td>0.689</td>
<td>0.525</td>
<td>5.832</td>
<td>Good validity</td>
<td></td>
</tr>
<tr>
<td>X6</td>
<td>0.573</td>
<td>0.671</td>
<td>4.705</td>
<td>Good validity</td>
<td>0.63</td>
</tr>
<tr>
<td>X7</td>
<td>0.573</td>
<td>0.525</td>
<td>2.972</td>
<td>Good validity</td>
<td></td>
</tr>
<tr>
<td>X8</td>
<td>0.689</td>
<td>0.525</td>
<td>2.110</td>
<td>Good validity</td>
<td></td>
</tr>
<tr>
<td>X9</td>
<td>0.573</td>
<td>0.672</td>
<td>4.702</td>
<td>Good validity</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shows that there are four variables observed from the KBM latent variable (namely X1-X4). The KBM latent variable has passed the validity test because it meets the requirements, namely a loading factor value ≥ 0.50 and t-value ≥ 1.96. However, construct reliability (CR) was 0.63 in the category currently. This shows that the validity test of the KBM variable produces good values and moderate consistency.

Table 2 presents the calculation of the validity and reliability of the PWU indicator variable. This table confirms the validity of all observed variables (X5-X9) is valid. It is known that the loading factor value for each indicator variable is ≥ 0.50 and the t-value is 1.96. Because the
construct reliability (CR) value is 0.77, the reliability of the PWU variable produces a good value. Thus, the PWU variable has good consistency.

To answer the research problem, we tested statistical hypotheses. Look at the diagram in Figure 4. The path diagram shows the t value used to determine the statistical hypothesis test Ho. The alternative hypothesis is H1: there is a connection positive between KBM and PWU. Look at Figure 4, the calculated t value is 11.364 > 1.96, so the Ho area is rejected. This means there is a correlation positive between the habit Study of mathematics through approach ethnomathematics with behavioral entrepreneurship.

Discussion

The results of this research support the previous statement, such as research results which state that there is a correlation between habit Study with behavioral entrepreneurship (Adirakasiwi et al., 2024). Learning mathematics based on problems assisted by the mathematics E-Module-based entrepreneurship can be implemented with Good (Lidiana & Sukestiyarno, 2023). Learning mathematics based on higher-order thinking Skills can skyrocket soul entrepreneurship students (Muhuyani et al., 2020). Learning mathematics-based practice entrepreneurship increases satisfaction among students in studying mathematics (Adirakasiwi et al., 2021). That all shows that the habit of studying mathematics correlated with behavior entrepreneurship. Innovation in learning process strategy arithmetic social based businessman increase ability of mathematical student (Turmuzi et al., 2022). Results study Masduki and Kurniasih (2019) is below Entrepreneur-based learning mathematics can become the solution in embedding character entrepreneurship to the student through learning mathematics. Learning mathematics in a way No direct own values entrepreneurship Wrong One, for example, material arithmetic that can introduce the student to principles of buying and selling, profit and make a loss. Thereby Enough convincing to conclude results study that the habit Study mathematics through the approach of ethnomathematics correlated positively with behavior entrepreneurship.

CONCLUSION

Conclusion study This is that Empirical structural equation models between KBM variables and The PWU variable are a good fit for the theoretical (conceptual) structural equation model. Validity of every KBM indicator variable and PWU produces good grades and shows good consistency. Finally, the habit of studying mathematics through the approach to ethnomathematics correlated positively with behavior entrepreneurship. That recommended to educators mathematics for designing learning mathematics through projects or approach learning through culture local And based behavior businessman. That very possible for the participants to educate achievement in a way academic and entrepreneurship soft skills.

REFERENCES


Economics, 10 (1), 38.


