

# Factors Affecting the Improvement of Cassava Cracker Business

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## ABSTRACT

In the dynamic landscape of the cassava cracker business, staying informed about the ever-evolving factors influencing its improvement is crucial for sustainable success. The purpose of this study was to determine the effect of the implementation of KKN-T MBKM activities carried out by students of the Mathematics Education Study Program on increasing the business of cassava crackers SMEs. KKN-T is a nonformal education but provides an important role not only for students but also for the community. The method used in this study is binary logistic regression analysis. The data used is primary data by distributing questionnaires to 20 respondents who are partners in KKN-T activities. The technique used in this data collection is to use a purposive sample technique. The results of the study indicate that the influencing factors are quality of information analysis according to partner needs; student contributions to partners; the contribution between the contribution and the needs of partners; student contributions provide benefits for partners; and student contributions can motivate an increase in value/quality of life. Meanwhile, based on the simulation of utility variables, it can be seen that the variables that have a significant effect on increasing SME business will provide an opportunity for an increase in the business of 99.68%. This research contributes knowledge related to the implementation of binary logistic regression in analyzing the influence of implementing KKN-T MBKM activities carried out by Mathematics Education Study Program students on increasing the cassava cracker UKM business.

**Keyword:** MBKM, Nonformal Education, Binary Logistic Regression.

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## INTRODUCTION

In accordance with Regulation Of The Minister Of Ministry of Education and Culture Of The Republic Of Indonesia concerning National Standards for Higher Education, Merdeka Belajar – Kampus Merdeka provides opportunities for students to take 1 (one) semester of learning or the equivalent of 20 (twenty) credits outside the study program at the same university; and study for a maximum of 2 (two) semesters or equivalent to 40 (forty) credits in the same study program at different universities, study in different study programs at different universities; and/or learning outside of Higher Education. The higher education sector in Indonesia is very diverse, so the implementation of the program has been designed by the government to take place gradually under a tiered system (Shak, 2021). Therefore, Merdeka Belajar – Kampus Merdeka is the answer to the expectations of the world of work for the competence of graduates (Maisyaroh et al., 2021).

The Innovation is an educational target Merdeka Belajar Policy – Kampus Merdeka provides space for universities to be able to design and implement innovative learning processes so that students can achieve optimal learning outcomes that are relevant to the needs of the whose achievements must be pursued (Crosscombe, 2018). Innovation can arise from high curiosity. Curiosity makes the mind always generate ideas, look for facts, make interpretations of learning experiences, and gather information (Mukhalalati &

Taylor, 2019; Shofwan et al., 2023). In this 21st century, students must be able to determine for themselves the learning they are participating in (Papaioannou et al., 2023). Students must have a positive attitude in learning activities (Tanti et al., 2020). In the concept of independent learning, students need to understand the meaning of freedom to determine what they have to learn (Hendri, 2020). This independence in learning will lead students to learning to learn where freedom of thought and the development of interests are the central point in the learning process (Hanson et al., 2023; Padhi & Mishra, 2020; Mulyana et al., 2021; Rea et al., 2022). Thus, universities must prepare students to become real learners who are skilled, flexible and tenacious (agile learners). Students understand what they are learning and gain new knowledge that is believed to be true (Kodelja, 2019). This means that the biggest global challenge for the education system is to prepare students to succeed in life (Khan et al., 2019).

The forms of learning activities for Merdeka Belajar – Kampus Merdeka include: Student Exchange, Internships/Work Practices, Teaching Assistance and Education Units, Research/Research, Humanitarian Projects, Entrepreneurial Activities, Independent Studies/Projects, and Building Villages/Thematic Real Work Lectures. Thematic Community Service Program (KKN-T) is a form of education that provides a learning experience for students to live with the community outside the campus. Some of the benefits of studying outside campus include: increasing abilities, expanding networks, learning culture outside campus, and building experiences (Su, 2018). In addition, the off-campus learning environment has a positive effect on students' cognitive, social, and emotional abilities (Closs et al., 2022). Learning with partners outside of campus can increase learning motivation and develop student skills (Arantes do Amaral et al., 2018). Students together with the community identify and develop village/regional potential and provide solutions to problems that exist in the village. Students must be able to learn to live together and develop projects in the community in the community (Camayang & Bautista, 2021). Learning to live with the community provides character experiences such as mutual respect, tolerance, good cooperation, and mutual cooperation (Figueredo-Canosa et al., 2020). Students are given the freedom to develop all abilities according to their competencies (Joseph et al., 2020). The benefits of KKN-T for universities include: Providing feedback to universities about science and technology that is really needed by the community, Being a means of developing the tri dharma of higher education, and Being a means of actualizing lecturers in the development of science.

Universities are not only required to involve students in off-campus activities, but also encourage lecturers to be active outside the campus. Lecturers must have strategies to face the challenges of learning outside of campus (Webber & Nickel, 2021). Lecturers must be able to make arrangements for conducive learning activities for students, so that students are able to create innovations in their learning (Heredia et al., 2019). One form of off-campus lecturer activity is research that produces prototypes for the benefit of the community. KKN-T's feedback on science and technology needed by the community can be an accommodative research material. Lecturers develop knowledge through research by associating it based on student activity feedback (Solfema & Wahid, 2018). Lecturers bridge the sharing of experiences, ideas, and innovations between students and the business world according to their knowledge and the needs of the business world (Schleicher, 2018).

This research activity is intended to determine the effectiveness of MBKM implementation in order to sharpen MBKM programs in the future. In addition, this research also facilitates the impact of MBKM implementation that occurs. Research on the impact of MBKM implementation is focused on the impact of KKN-T implementation in Bandungrejo Village, Bantur District, Malang Regency. Most of the residents of Bandungrejo village are farmers, including entrepreneurs who make snacks, such as cassava crackers. Based on the results of field observations and interviews with KKN-T students with UKM (Small and Medium Enterprises) partners of cassava crackers, that the manufacture of cassava crackers still uses production equipment that uses human power. This results in the production process taking a long time and requiring extra energy. Therefore, it is necessary to apply technology in the form of chopping and grating machines to increase the production of cassava crackers. In line with the demands of the MBKM education system, namely technological literacy (Christanti & Sukoco, 2022). Learning requires technology and knowledge to understand the use of these technologies (Carvalho & Yeoman, 2021).

KKN-T is a learning program that is not formal but provides an important role not only for students but also for the community. The non-formal education in question includes providing skills for economic and social development and meeting basic needs (Islahi & Nasrin, 2022; Kim, 2020; Mulyadi, 2020). Non-formal education can be an opportunity for the community to provide in and increase knowledge and through learning technology provided (Kisworo, et al., 2022; Rahma et al., 2019).



**Figure 1.** Traditional Tools for Making Cassava Chips

With reference to the problem analysis, this study aims: (1) to analyze the impact of the implementation of KKN-T MBKM Mathematics Education Study Program, and (2) to facilitate the innovation-based economy of UKM Krupuk Cassava Bandungrejo through the manufacture of chopping and grating machines for cassava crackers. This research is important to do to bridge the impact of the implementation of KKN-T MBKM on SME partners in the village. Thus the implementation of KKN-T MBKM is in accordance with the competencies possessed by students and can be in line with the needs of partners.

The importance of this research is to determine the effect of implementing KKN-T MBKM activities carried out by students of the Mathematics Education Study Program on increasing the cassava cracker UKM business through the application of binary logistic regression.

## METHOD

This study aims to determine the factors that influence the improvement of partner businesses in the implementation of MBKM activities for KKN-T students of the Mathematics Education Study Program. The data used in this study is primary data related to increasing partner businesses in the implementation of MBKM for KKN-T activities. Data collection technique is by using purposive sampling method. The sample selection based on this technique was carried out by considering that the respondents were partners in the MBKM KKN-T activity engaged in the production of cassava crackers located in Bandungrejo Village, Bantur District, Malang Regency. This technique was carried out with the aim of determining the sample size through a questionnaire to obtain primary data (Rahmayanti, et al., 2021). Meanwhile (Moreno-Gómez et al., 2023) state that the selection of respondents as research samples using purposive sampling techniques must be adjusted to the criteria so that research results can be more accurate.

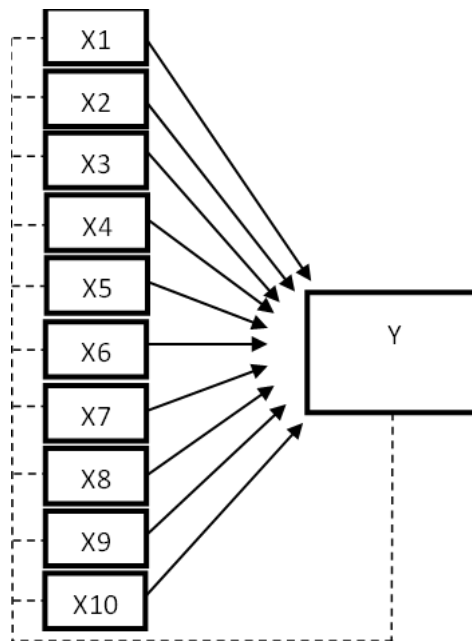
Furthermore, the research instrument in the form of a questionnaire distributed to 20 partner respondents in the program. Questionnaire is an instrument to generate data which can be in the form of statistical data (McCrudden et al., 2021). The list of questions in the questionnaire is given in table 1.

**Table 1.** The List of Questions in The Questionnaire

No	Item	Variable Code
1	Completeness of Information	X1

2	Student Consistency in MBKM Activity	X2
3	Student outlook in information fulfillment of completeness of partner	X3
4	Information analysis quality	X4
5	Contribution to partner	X5
6	Balancing of contribution and partner's need	X6
7	Students contribution give benefit to partner	X7
8	Student competence compared to contribution quality to partner	X8
9	Student contribution can motivate the improvement of life quality	X9
10	Supervision in activity of MBKM	X10
11	Did the MBKM program in this KKN-T activity provide improvement for your village/business/institution?	X11

Before the questionnaire is given to partners, validity and reliability tests are first carried out to ensure the validity of the data obtained. Research that has met the two tests provides a clear opportunity for questionnaire users in predicting the accuracy of the instruments used (Chetwynd, 2022; Peeters & Harpe, 2020). In addition, the final results of a credible instrument get appreciation and good understanding from respondents (Rahmat et al., 2023). The validity test was carried out with the significance value and Pearson's product moment, while the reliability test was carried out by analyzing Cronbach's Alpha. The variables in this study were divided into two, namely explanatory variables and response variables. Based on table 1 above, the relationship between these variables can be seen in figure 2.



**Figure 2.** The Relationship Between Explanatory Variables and Response Variables

The data analysis technique was carried out through statistical processing based on binary logistic regression analysis. The binary logistic regression model was used to analyze the relationship between one respondent variable and several predictor variables, with the response variable in the form of dichotomous qualitative data, with a value of 1 to indicate the presence of a characteristic and a value of 0 to indicate the absence of a characteristic. The binary logistic regression model is used if the variable produces two categorical values 0 and 1, so it follows the Bernoulli distribution.

Statistical tests on logistic regression analysis used the help of IBM SPSS Statistics 23 Software. The following statistical tests will be used in this study.

### The Partial Test of Parameter

This test is used to determine the effect of each predictor variable on the individual response variables. The test statistic used is the Wald test (Test-Wald). In this test, the null hypothesis used is the predictor variable has no effect on the response variable. With a significance level ( $\alpha$ ) of 0.05, the conclusion is drawn based on the value of  $\text{sig.} < 0.05$  atau  $W^2 > X^2(df; \alpha)$ , with the conclusion that the null hypothesis is rejected.

### The Simultaneous Test of Parameter

Simultaneous testing of parameters was carried out using the G test. The G statistic was spread according to a chi-square distribution. The G test shows that the overall logistic model can explain or predict the predictor variables to the response variables. In this test, the null hypothesis used is that the predictor variables together have no effect on the response variable. With a significance level ( $\alpha$ ) of 0.05, the conclusion is drawn based on the value of  $\text{sig.} < 0.05$  atau  $G > X^2(df; \alpha)$ , with the conclusion that the null hypothesis is rejected.

### Model Fit Test

The model suitability test is used to determine whether there is a difference between the observed results and the possible prediction results. The null hypothesis used is the appropriate model (there is no difference between the results of the observations and the probability prediction results). With a significance level ( $\alpha$ ) of 0.05, the conclusion is drawn based on the value of  $\text{sig.} > 0.05$  with the conclusion is accept the null hypothesis. Meanwhile, the formation of the logit model is based on the formation of the logistic regression function which is specified as follows:

$$P_i = \frac{1}{1 + e^{-z}} = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x_1 + \dots + \beta_p x_p)}}$$

where:

$P_i$  = Opportunity for an increase in partner business in the implementation of MBKM KKN-T

$\beta$  = Coefficient of the explanatory variable (predictor)

$x$  = Explanatory variable (predictor)

## RESULTS AND DISCUSSION

One of the MBKM activity is KKN-T. KKN-T activity in this research is done by 20 students from Mathematics Education Department in UNIKAMA. This activity give them off-campus study program to get personal experience in community-service activity. Through this KKN-T, student can applied their knowledge, innovation, and creativity in developing village.

Early observation is done by students by giving information of MBKM program to village apparatus and interviewing in problem identification in that village. From our interview, we have information that the biggest potential in that village is cassava. Surrounding community has use it as cassava chips, but they have no ability to manage their product. Our student use that problem as their main program in KKN-T.

Later observation is done by visiting to cassava chips factory and inform their MBKM program to the owner and employee. Next activity is interviewing about needs identification in cassava chips to their partner. This identification is important since it become the first step in constructing and developing product management. This statement is in line with the research from El-Fakhrany & Aboegela (2021) and Septiarti et al. (2020) which said that needs identification is done to find priority in needs and to decession making to acieve specific purpose. Beside that, need identification can be one of the method to find and evaluate need (Nimasari, 2018; Kasyulita et al., 2022).

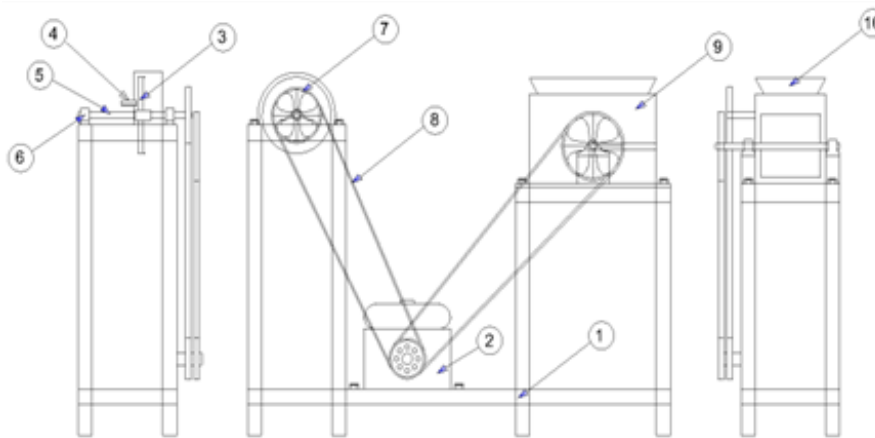
Based on observation done by students, we can find our partner's need as follows: a) Time, place, and energy for the production of cassava crackers to be more efficient, b) The volume of crackers increases, and c) The results of the grating are smoother. Students provide innovation by designing cassava cracker chopping

and grating machines in this KKN-T activity. The steps taken by these students in an effort to achieve program implementation include:

### Machinery Manufacturing

Machine manufacture is carried out in the workshop from December 13 to 20, 2021. The steps for making the machine are as follows: a) Machine design, Machine design is customized with partner's needs and use as reference in next activity. The purpose of this design, include developing cost estimation is to avoid error in fabrication process and loss, b) Material selection, Efficiency is applied in material and tools selection so that production time become effective and efficient. Material selection including selection in machine components and additional material list and its specification, c) Fabrication process, this process is completed as a network in task, starting from component as in material list, component is assembling step by step until it become industrial machine or construction. In fabrication process, cutting and splicing part is done by welding, bending, drilling, component making, and grinding, d) Assembling process, this process is the following step after fabrication, that is to assemble each component part to become one tools, e) Field testing, usually called FAT (Factory Acceptance Test) is a process where after this machine is assembled we test it to observe, f) Its performance or possibly of damage or unfunctional part. This process is tested in workshop and can be seen by our partner, and g) Performance and operational evaluation, is final process which tested machine is send to partner's location where trial is done without product (dry run). We use one of our partner's as operator. If another troubleshooting is found then we fix the problem. If there is no more trouble, then the machine is ready to handover to our partner.

The Description of cassava chopper and grate machine design: 1) Engine skeleton, 2) Diesel Engine, 3) Cassava Chopper Tool, 4) Place the Cassava into the Chopper, 5) Shaft, 6) Bearing, 7) Pulley, 8) V-Belt, 9) Cassava Grater Tool, and 10) Place the Cassava into the Grater.



**Figure 3.** Cassava Chopper and Grate Machine Design

The specification of chopper and grater is as follows.

- Dimension : 1000 x 40 x 1400 mm.
- Machine Frame : Equal angle iron 40 x 40 x 2 mm
- Machine : Liquid fuel 2 HP
- Fuel : Liquid
- Chopper and Grater Material : Stainless Steel
- Transmission System : Pulley – V-Belt.

This Chopper and Grater can work together (2 in 1), where this machine can be used together at the same time. Chopper machine workflow is as follows, cassava is push to input part like circle shaped and semicircle holder. Next, 4 chop that stick to plate chopping those cassava. The result is rounded-thin cassava.

The slice is out from output part. Cassave grater machine workflow is as follow, cassava is push into upper part of the machine, then grinder, part of the machine which function is to grind cassava to make a softer texture.

Chopper and Grater machine as appropriate technology alternative practical solution for efficiency and effectivity to replace manual workflow that needed labour and costing time. The construction of chopping and Grating cassava machine customizing the ergonomoy of worker so it can work as needed. We tested this machine in workshop as early activity, then we give training and operational assistance, including machine maintenance guide.

### Training and Operational Assistance

Training and operational assistance is held in December 21, 2021. This activity is attended by the owner of small and medium enterprises, his labour, and village head of Bandungrejo. The aim of this activity is to make a transfer of technology, strenghtening product management, including maintenance training. This training and operational assistance is addressed to partenr’s labour so that they have ability to operate the machine, that is chopping and grating machine. The focus of this activity is quality and quantity improvement to our partner.

### Evaluating and Monitoring

After training and assistance evaluating and monitoring is held in between 22 to 23 December 2021. This activity is implemented continuously as part of follow-up program. The aim of this activity is to find the improvement and problem that happened after the program ended and give solution. Coordination about this improvement and problem is done not only with the owner but also with village head.

**Table 2.** Validity Result of Questionnaire of The Impact of MBKM Implementation to Partner

No	Item	Variable Code	sign. (2-tailed)	Pearson Correlation	Decission
1	Completeness of Information	X1	0.031	0.837	Valid
2	Student Consistency in MBKM Activity	X2	0.011	0.813	Valid
3	Student outlook in information fulfillment of completeness of partner	X3	0.048	0.753	Valid
4	Information analysis quality	X4	0.021	0.825	Valid
5	Contribution to partner	X5	0.000	0.363	Valid
6	Balancing of contribution and partner’s need	X6	0.018	0.285	Valid
7	Students contribution give benefit to partner	X7	0.000	0.711	Valid
8	Student competence compared to contribution quality to partner	X8	0.037	0.620	Valid
9	Student contribution can motivate the improvement of life quality	X9	0.029	0.674	Valid
10	Supervision in activity of MBKM	X10	0.000	0.531	Valid
11	Did the MBKM program in this KKN-T activity provide improvement for your village/business/institution?	Y	0.005	0.624	Valid

Meanwhile, to better understand the impact of implementing MBKM on the improvement of partner businesses in this KKN-T, the department gave questionnaire to the village head, the owner of a small and medium enterprise and its employees. The result of questionnaire validity for partners is given in table 2. Since all of the questions have sign. (2-tailed) < 5% (0.05) and Pearson Correlation are positive, then it can be concluded that all of those questions are valid.

**Table 3.** Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
.861	10

Next, the result of questionnaire reliability is given in table 3. From this test, we found that Cronbach's Alpha = 0.861 > 0.6. This shows that all of questionnaire items are reliable (consistent). We give this questionnaire to 20 partners in this KKN-T activity.

Furthermore, researchers used a binary logistic regression test to determine the impact of the implementation of MBKM on KKN-T activities on partners. In accordance with research (Wiyono and Astuti, 2019) it is shown that for multinomial responses with data collected are nominal and ordinal data, the factors that influence a model can be analyzed by applying logistic regression. This study has 10 explanatory variables which are modeled using the binomial logit which has categories 1 and 0.

**Table 4.** Answer Category of Explanatory Variables

Variable Code	Answer Category
X1, X2, X3, X4, X5, X6,X7, X8, X9, dan X10	1 : Agree
	0 : Disagree
Y	1 : Yes
	0 : No

**The Binary Logistics Regression Model**

The results of the binary logistic regression coefficient test with SPSS are given in the table 5.

**Table 5.** Binary Logistic Regression Result  
Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 <sup>a</sup>	X1(1)	.394	.354	1.240	1	.265	.394
	X2(1)	.593	.395	2.252	1	.133	1.809
	X3(1)	-2.002	.947	.009	1	.081	.135
	X4(1)	.072	.746	4.470	1	.002	11.075
	X5(1)	1.914	.741	6.669	1	.014	6.778
	X6(1)	1.143	.903	1.604	1	.000	3.138
	X7(1)	.361	1.131	5.102	1	.035	12.435
	X8(1)	.453	.361	1.574	1	.210	1.573
	X9(1)	1.787	.828	4.658	1	.022	5.167
	X10(1)	-1.040	1.496	.483	1	.092	.336
	Constant	0.474	0.678	5.949	1	.015	2.829

a. Variable(s) entered on step 1: X1, X2, X3, X4, X5, X6, X7, X8, X9, X10.

The parameter coefficient of the regression model can be seen in the first column of table 5. By paying attention to the significant explanatory variable, the binary logistics regression model is given as follows

$$P_i = \frac{1}{1 + e^{-(0,474+0,072x_4+1,914x_5+1,143x_6+0,361x_7+1,787x_9)}}$$

The calculation of the opportunity to increase business partners is carried out based on the simulation of utility variables with the selection of variable values that provide the biggest opportunity, namely x4 = 1, x5 = 1, x6 = 1, x7 = 1, and x9 = 1. The results of the calculation of the variable simulation are obtained.



$$P_i = \frac{1}{1 + e^{-(0,474+0,072(1)+1,914(1)+1,143(1)+0,361(1)+1,787(1))}}$$

$$P_i = \frac{1}{1 + e^{-(5,751)}} = 0,9968$$

Based on simulation calculations in the equation 3, it can be seen that variables X4, X5, X6, X7, and X9, have a significant influence on the increase in the cassava cracker OKM business with the opportunity to increase the business of 99.68%.

### The Partial Test of Logistic Regression Parameters

The next step is to do a partial test of logistic regression parameters carried out based on the sig. value 0.05. Based on table 4, it can be seen that the explanatory variable which has a value of sig. value < 0.05 is X4 (quality analysis of information according to partner requirements), X5 (student contributions to partners), X6 (suitability between contributions to partners), X7 (student contributions to provide benefits for partners), and x9 (student contributions can motivate improvement Value/quality of life). The explanatory variable is a variable which has a significant influence on the increase in partner businesses. The variable coefficient value that is positively marked means that the explanatory variable has a relationship that is directly proportional to the response variable.

### The Simultaneous Test of Logistic Regression

The simultaneous test of logistic regression is carried out with the nul hypothesis used, the predictor variables together have no effect on the response variable. These simultaneous test results can be seen through the Omnibus Test of Coefficients model in the table 6.

**Table 6.** Omnibus Test of Coefficients

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	13.248	2	.002
	Block	13.248	2	.002
	Model	13.248	2	.002

The resulting G statistical value is 13.248, where this value is greater than the value  $X^2(2; 0,05) = 5.991$ , so the conclusion taken is reject the zero hypothesis. It can be interpreted that predictor variables that have a significant effect together with the same variable response.

### The Model Fit Test

The Model Fit Test is used to test whether the resulting model is feasible or not. The zero hypothesis used for this test is the appropriate model (there is no difference between observation results and the possibility of prediction results). The results of the Goodness of Fit Test can be seen based on table 7.

**Table 7.** Hosmer and Lemeshow Test

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	4.952	2	.666

Based on table 7, the sig. value is 0.666, where this value is greater than 0.05, so the zero hypothesis is accepted. This means that the model is appropriate or there is no difference between the results of observation with the prediction results. Thus, the binary logistic regression model obtained is suitable for explaining how much opportunity for an increase in the SME business of Mitra cassava chips.

### **Interpretation of The Significant Variable**

The variable coefficient value that is positively marked means that the explanatory variable has a relationship that is directly proportional to the response variable. Based on the value of  $\beta$  in table 5, the interpretation of each explanatory variable that has an impact is given as follows.

Quality Analysis of information that is in accordance with the needs of partners will increase partner businesses 11 times better than information analysis that is not right with partner needs. Observation activities carried out by students on the KKN-T program function to find out what partner needs in the development of production. In addition, the suitability of identification needs has been directed to provide solutions to existing problems. Identification of this need is also a procedure in determining priority and decision making.

The contribution of students to partners given optimally will be able to increase partner businesses 6 times better than students who are less in contributing to partners. In the completion of partner problems, the student's contribution has a considerable contribution. The contributions carried out by students are designing and designing cassava crackers and griping machines as an effort in improving the quality and quantity of cassava crackers partners and providing training and operational assistance to the machine.

The suitability between contributions to the needs of partners will provide an increase in partner business 3 times better than contributions that are not in accordance with partners. Based on the needs of the partners that have been described earlier, students have provided the right solution in meeting partner needs, especially on problems in the field of production.

The contribution of students directed to provide benefits for partners is able to increase business partners 12 times better than students who do not provide benefits for partners. Seeing the various contributions that have been given by the students, then of course this will have a positive impact on partners. Based on the results of interviews and observations that have been carried out after the KKN-T program is known that there is an increase in production capacity of 75%, the quality of cassava crackers is increasingly hygienic, partners also have knowledge related to the technology used to crack and grate cassava crackers. In addition, partners also have skills in operating and maintenance on machines provided.

Contributions of students who can motivate the increase in value / quality of life will be able to increase business partners 5 times better than partner contributions that do not provide motivation to increase value/quality of life. The design of chopper machines and cassava crackers, strongly has a significant impact, especially in the well-being of these businesses. This can be seen from the increase in production which also affected the increase in sales and turnover obtained by partners. The partner said that marketing would be more expanded again not only around Malang Regency, but was planned to be marketed outside the city like Sidoarjo and Kediri.

### **CONCLUSION**

Based on the results of this study, it can be concluded that the factors of the implementation of the KKN-T MBKM which have a significant influence on the increase in the business of the cassava cracker business partner are a) quality analysis of information according to partner requirements, b) student contributions to partners, c) suitability between contributions to partners, d) student contributions to provide benefits for partners, and e) student contributions can motivate improvement Value/quality of life. Meanwhile, the simulation calculations show that the explanatory variable has the opportunity to increase the partner's business of 99.68%. The novelty of this research is the implementation of binary logistic regression in analyzing the

influence of implementing KKN-T MBKM activities carried out by Mathematics Education Study Program students on increasing the cassava cracker UKM business.

## REFERENCES

- Arantes do Amaral, J. A., Araujo, C. R. M., & Lino dos Santos, R. J. R. (2018). Lessons learned implementing project-based learning in a multi-campus blended learning environment. *Journal of Problem Based Learning in Higher Education*, 6(2), 1–31. <https://doi.org/10.5278/ojs.jpblhe.v6i2.1928>
- Camayang, J. G., & Bautista, R. G. (2021). Learning together, learning deeper: A little teacher assisted learning engagement. *International Journal of Evaluation and Research in Education*, 10(2), 412–420. <https://doi.org/10.11591/ijere.v10i2.21070>
- Carvalho, L. & Yeoman, P. (2021). Performativity of materials in learning: the learning-whole in action. *Journal of New Approaches in Educational Research*, 10(1), 28–42. <https://doi.org/10.7821/NAER.2021.1.627>
- Chetwynd, E. (2022). Critical Analysis of Reliability and Validity in Literature Reviews. *Journal of Human Lactation*, 38(3), 392–396. <https://doi.org/10.1177/0890334422110020>
- Christanti, R. & Sukoco, A. A. (2022). Freedom to learn–independent campus policy: Do we really find our freedom?. *Journal of Education and Learning (EduLearn)*, 16(2), 189–198. <https://doi.org/10.11591/edulearn.v16i2.20477>
- Closs, L., Mahat, M., & Imms, W. (2022). Learning environments' influence on students' learning experience in an Australian Faculty of Business and Economics. *Learning Environments Research*, 25(1), 271–285. <https://doi.org/10.1007/s10984-021-09361-2>
- Crosscombe, N. (2018). Innovation. *Brock Education Journal*, 27(2), 48–52. <https://doi.org/10.26522/brocked.v27i2.576>
- El-Fakhrany, W. B. & Aboegela, M. A. (2021). Manufacture and Development of a Small Threshing Machine. *J. of Soil Sciences and Agricultural Engineering*, 12(3), 117–122. <https://doi.org/10.21608/jssae.2021.157375>
- Figueredo-Canosa, V., Jiménez, L. O., Romero, C. S., & Berlanga, M. C. L. (2020). Teacher training in intercultural education: teacher perceptions. *Education Sciences*, 10(3), 81. <https://doi.org/10.3390/educsci10030081>
- Hanson, R., Shapiro, S., Hutton-Thamm, E., Hagerty, M. R., & Sullivan, K. P. (2023). Learning to learn from positive experiences. *The Journal of Positive Psychology*, 18(1), 142–153. <https://doi.org/10.1080/17439760.2021.2006759>
- Hendri, N. (2020). Merdeka belajar: antara retorika dan aplikasi. *E-Tech*, 8(1), 1–29. <https://doi.org/10.1007/XXXXXX-XX-0000-00>
- Heredia, J. de M., Carvalho, L., & Vieira, E. M. F. (2019). Designing for distance learning in developing countries: a case study. *Journal of Open, Flexible and Distance Learning*, 23(1), 5–16. <https://doi.org/10.61468/jofdl.v23i1.346>
- Islahi, F. & Nasrin, N. (2022). Exploring The Potential of Non-Formal Education For The Development Of Human Capital In India. *Journal Of Nonformal Education*, 8(1), 1–11. <https://doi.org/10.15294/jone.v8i1>
- Joseph, S., Murphy, D., & Holford, J. (2020). Positive education: A new look at Freedom to Learn. *Oxford Review of Education*, 46(5), 549–562. <https://doi.org/10.1080/03054985.2020.1726310>
- Kasyulita, E., Donal, A., Antoni, R., Niati, B., & Eripuddin, E. (2022). Need Analysis of Management Students Towards the English Learning Material. *Academy of Education Journal*, 13(2), 359–368. <https://doi.org/10.47200/aoej.v13i2.1108>
- Khan, A., Yuster, A., Franco, A., Williams, C., Comini, D., Van Kalmthout, E., Cappelaere, G., Cron, H., Dutra, I., Fontaine, M., Poirier, M.-P., Perceval, M., Gilgan, M., Dahal, N., Dongen, R. Van, Singh, S., Hozumi, T., Taton, V., & Tauro, W. G. (2019). *Every child learns unicef education strategy 2019-2030*. New York: UNICEF.

- Kim, D. (2020). The Correlation Analysis between Korean Middle School Students Emotional Level and Friendship in Science Learning. *Jurnal Pendidikan IPA Indonesia*, 9(1), 22–31. <https://doi.org/10.15294/jpii.v9i1.22744>
- Kisworo, B., Raharjo, T. J., Prasojo, L. D., & Sujarwo, S. (2022). Implementation Of Supply Chain Management Information System in Non-Formal Education Business. *Journal Of Nonformal Education*, 8(1), 81–88. <https://doi.org/10.15294/jone.v8i1>
- Kodelja, Z. (2019). Is machine learning real learning?. *Center for Educational Policy Studies Journal*, 9(3), 11–23. <https://doi.org/10.26529/cepsj.709>
- Maisyaroh, Juharyanto, Bafadal, I., Wiyono, B. B., Ariyanti, N. S., Adha, M. A., & Qureshi, M. I. (2021). The Principals' Efforts in Facilitating the Freedom to Learn By Enhancing Community Participation In Indonesia. *Cakrawala Pendidikan*, 40(1), 196–207. <https://doi:10.21831/cp.v40i1.36119>
- McCrudden, M. T., Marchand, G., & Schutz, P. A. (2021). Joint displays for mixed methods research in psychology. *Methods in Psychology*, 5, 100067. <https://doi.org/10.1016/j.metip.2021.100067>
- Moreno-Gómez, J., Londoño, J. C., & Zapata-Upegui, L. F. (2023). Marketing strategy and competitiveness: Evidence from Colombian SMEs. *Tec Empresarial*, 17(2), 48–64. <https://dx.doi.org/10.18845/te.v17i2.6701>
- Mukhalalati, B. A. & Taylor, A. (2019). Adult Learning Theories in Context: A Quick Guide for Healthcare Professional Educators. *Journal of Medical Education and Curricular Development*, 6, 1–10. <https://doi.org/10.1177/2382120519840332>
- Mulyadi, D., Suryadi, S., & Aliyyah, R. (2020). Life Skills Education Program: Is It Beneficial For The Society?. *Journal of Nonformal Education*, 6(2), 101–106. <https://doi.org/10.15294/jne.v6i2.24456>
- Mulyana, T., Kurniasih, S., & Ardianto, D. (2021). Assessment for Learning: Changes in the Role of Assessment in Learning. *IJORER: International Journal of Recent Educational Research*, 2(5), 580–589. <https://doi.org/10.46245/ijorer.v2i5.146>
- Nimasari, E. P. (2018). An esp needs analysis: addressing the needs of english for informatics engineering. *Journal of Educators Society*, 3(1), 23–40. <https://doi.org/10.21070/jees.v3i1.1085>
- Padhi, L. K. & Mishra, D. (2020). Learning How to Learn: An Analysis Through Styles and Strategies. *International Journal of Web-Based Learning and Teaching Technologies*, 15(3), 46–58. <https://doi.org/10.4018/IJWLTT.2020070104>
- Papaioannou, G., Volakaki, M. G., Kokolakis, S., & Vouyioukas, D. (2023). Learning Spaces in Higher Education: A State-of-the-Art Review. *Trends in Higher Education*, 2(3), 526–545. <https://doi.org/10.3390/higheredu2030032>
- Peeters, M. J. & Harpe, S. E. (2020). Updating conceptions of validity and reliability. *Research in Social and Administrative Pharmacy*, 16(8), 1127–1130. <https://doi.org/10.1016/j.sapharm.2019.11.017>
- Rahma, R.A., Zulkarnain, Desyanty, E.S., Wahyuni, S. (2019). The Role Of Community Learning Center (CLC) In Providing Nonformal Education Services Based On Entrepreneurship. *Journal Of Nonformal Education*, 5(2), 109–116. <https://doi.org/10.15294/jne.v5i2>
- Rahmat, A., Suharyati, H., Mulawarman, W. G., Rosmaladewi, O., Mirnawati, M., & Angelina, M. (2023). The Influence of Leadership Discipline on the Quality-of-Service Implementation of Nonformal Education Program. *Journal of Nonformal Education*, 9(2), 226–240. <https://doi.org/10.15294/jne.v9i2.43276>
- Rahmayanti, D., Wirdianto, E., Arief, I., Zahra, A.F., & Ahmad, H. (2021). Factors Affecting Customer Satisfaction in e-Commerce. *Jurnal Ilmiah Teknik Industri*, 20(2), 164–172. <https://doi.org/10.23917/jiti.v20i2.15635>
- Rea, S. D., Wang, L., Muenks, K., & Yan, V. X. (2022). Students Can (Mostly) Recognize Effective Learning, So Why Do They Not Do It?. *Journal of Intelligence*, 10(4), 127. <https://doi.org/10.3390/jintelligence10040127>
- Schleicher, A. (2018). Educating learners for their future, not our past1. *ECNU Review of Education*, 1(1), 58–75. <https://doi.org/10.30926/ecnuroe2018010104>

- Septiarti, S. W., Surjarwo, Santi, F. U., & Trisanti. (2020). Optimization of Community Reading Garden Management in Improving Reading Culture. *Journal of Nonformal Education*, 6(1), 85–91. <https://dx.doi.org/10.15294/jne.v6i1.23479>
- Shak, D. (2021). Mechanism, Implementation, and Challenges in Independent Campus Education Policy in Indonesia. *International Journal of Science and Society*, 3(4), 52–63. <https://doi.org/10.54783/ijssoc.v3i4.393>
- Shofwan, I., Sunardi, S., Gunarhadi, G., & Rahman, A.H. (2023). Entrepreneurship Education: Encouraging Entrepreneurial Intentions for Equality Education Students in Semarang. *International Journal of Learning, Teaching and Educational Research*. <https://doi.org/10.26803/ijlter.22.6.10>
- Solfema, S. & Wahid, S. (2018). Peer Group Learning Method to Improve the College Student Achievement. *Journal of Nonformal Education*, 4(2), 187–196. <https://doi.org/10.15294/jne.v4i2.16008>
- Su, M. (2018). Work a way out: breaking monoethnic isolation through on-campus employment. *Journal of International Students*, 8(3), 1363–1385. <https://doi.org/10.5281/zenodo.1254596>.
- Tanti, Maison, Syefrinando, B., Daryanto, M., & Salma, H. (2020). Students' self-regulation and motivation in learning science. *International Journal of Evaluation and Research in Education*, 9 (4), 865–873. <https://doi.org/10.11591/ijere.v9i4.20657>
- Webber, C. F. & Nickel, J. (2021). Sustainable teacher leadership. *Research in Educational Administration and Leadership*, 6(1), 277–311. <https://doi.org/10.30828/real/2021.1.9>
- Wiyono, A. S. & Astuti, S. P. (2019). Promoting Product Service System for Motorcycle: A Study of Ridesharing Program Intention for University Students. *Jurnal Ilmiah Teknik Industri*, 18(2), 142–152. <https://doi.org/10.23917/jiti.v18i2.8738>.