



Implementation of Co-Curricular Activities in Fostering Entrepreneurial Motivation Through the Local Wisdom of Glutinous Rice Vinegar Fermentation in Vocational High Schools (SMK) in Tayan Hulu District

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ABSTRACT

Background: Co-curricular activities in Vocational High Schools (SMK) serve as a strategic vehicle for contextual and meaningful entrepreneurship learning. Glutinous rice vinegar fermentation, as a local wisdom of the Dayak community in Tayan Hulu District, holds significant cultural and economic value as a medium for entrepreneurship education grounded in local potential.

Objectives: This study aims to describe the implementation of co-curricular activities based on glutinous rice vinegar fermentation, to analyze the partial effect of co-curricular implementation (X_1) and local wisdom of fermented vinegar (X_2) on students' entrepreneurial motivation (Y), and to test their simultaneous effect in three SMKs in Tayan Hulu District, Sanggau Regency, West Kalimantan.

Methods: The study employed a quantitative approach with a descriptive-associative design. A total of 57 Grade XI students were selected using proportional random sampling from a total population of 238 students at SMKN 1 Tayan Hulu, SMKS Kristen Agape Patria Sosok, and SMKS Bina Utama Sosok. Data were collected through questionnaires that had been tested for validity and reliability, and analyzed using multiple linear regression, partial t-tests, simultaneous F-tests, and the coefficient of determination (R^2).

Findings: Results revealed that all instrument items were valid ($r_{\text{teanac}} > r_{\text{table}} = 0.2162$) and reliable (Cronbach's Alpha: $X_1 = 0.688$; $X_2 = 0.725$; $Y = 0.704$). Data were normally distributed ($\text{sig.} = 0.200 > 0.05$) and free from multicollinearity ($\text{VIF} = 1.114 < 10$). Partially, co-curricular implementation had a significant effect on entrepreneurial motivation ($\text{sig.} = 0.021 < 0.05$; H_1 accepted), whereas local wisdom alone did not have a significant effect ($\text{sig.} = 0.089 > 0.05$; H_2 rejected). Simultaneously, both variables had a positive and significant effect ($F = 6.287$; $\text{sig.} = 0.004$; H_3 accepted) with Adjusted $R^2 = 0.159$.

Conclusion: Co-curricular activities based on the local wisdom of glutinous rice vinegar fermentation are proven effective in fostering students' entrepreneurial motivation, particularly when implemented in a planned, systematic manner rooted in local cultural values. More sustained program development is needed for the influence of local wisdom to become statistically detectable.

KEYWORDS: co-curricular implementation, local wisdom, glutinous rice vinegar fermentation, entrepreneurial motivation, vocational education, Dayak community

INTRODUCTION

Vocational High Schools (SMK) in Indonesia play a strategic role in producing graduates who are not only technically competent but also possess strong entrepreneurial motivation and spirit. Within the framework of the Merdeka Curriculum, co-curricular activities are officially mandated as a vehicle for contextual learning outside intracurricular hours, aimed at strengthening students' competencies, character, and entrepreneurial spirit (Permendikdasmen No. 13, 2025). However, research indicates that co-curricular programs in many schools have not been systematically directed toward building entrepreneurial character traits such as creativity, responsibility, and independence (Hildianto & Iswandari, 2024).

The integration of local wisdom into entrepreneurship education offers a grounded and contextual approach to bridging this gap. Local wisdom, defined as knowledge, values, and practices passed down across generations, functions not merely as cultural heritage but also as a tangible economic resource that can be developed for community welfare (Nuringsih & Edalmen, 2021). Glutinous rice vinegar fermentation as a tradition of the Dayak community in West Kalimantan is a form of local wisdom that holds both cultural value and scientifically measurable commercial potential. This product contains acetic acid with antibacterial activity that adds value from a health and food safety perspective (Nalino et al., 2025).



Tayan Hulu District in Sanggau Regency is an area where the tradition of producing glutinous rice vinegar remains embedded in the social and agricultural life of the local Dayak community. Three SMKs operate in this district: SMKN 1 Tayan Hulu, SMKS Kristen Agape Patria Sosok, and SMKS Bina Utama Sosok. These three schools form an appropriate context for examining how co-curricular activities grounded in local fermentation tradition can foster students' entrepreneurial motivation. Empirical evidence consistently shows that experience- and project-based learning within a co-curricular framework significantly improves students' entrepreneurial competencies (Pratama et al., 2023; Sungkawati & Vedianty, 2025). However, no study has been found that comprehensively examines co-curricular implementation, the use of fermentation-based local wisdom, and the quantitative measurement of entrepreneurial motivation within a single research framework, particularly in the context of vocational education in Kalimantan.

This study aims to: (1) Describe the implementation of co-curricular activities based on glutinous rice vinegar fermentation in SMKs in Tayan Hulu District; (2) Analyze the partial effect of co-curricular implementation and the utilization of local wisdom on students' entrepreneurial motivation; and (3) Test the simultaneous effect of both variables on entrepreneurial motivation. The findings of this study are expected to contribute to the development of a local wisdom-based entrepreneurship education model in Indonesian SMKs.

MATERIALS AND METHODS

This study employed a quantitative approach with a descriptive-associative design (Sugiyono, 2020). The descriptive component was used to describe the implementation of glutinous rice vinegar fermentation co-curricular activities at the research sites, while the associative component was used to analyze the relationships and effects among the research variables. The study was conducted in three SMKs in Tayan Hulu District, Sanggau Regency, West Kalimantan: SMKN 1 Tayan Hulu (established 2023, 44 Grade XI students), SMKS Kristen Agape Patria Sosok (established 2002, 27 Grade XI students), and SMKS Bina Utama Sosok (established 1996, 167 Grade XI students). The total population of Grade XI students involved in co-curricular activities was 238 individuals. Using proportional random sampling, 57 students were designated as the research sample.

Field research activities were conducted in two meetings at each school during the period of May to June 2025. The first meeting focused on introducing local wisdom values and the initial fermentation practice of glutinous rice vinegar, while the second meeting covered further processing, product packaging, and a marketing simulation.

Three variables were operationalized in this study: (X_1) Co-curricular implementation, measured through indicators of activity planning, activity execution, and activity evaluation; (X_2) Local wisdom of glutinous rice vinegar fermentation, measured through indicators of understanding of local wisdom, glutinous rice vinegar fermentation practices, and utilization in learning; and (Y) Entrepreneurial motivation, measured through indicators of interest in entrepreneurship, self-confidence, persistence and risk-taking courage, and creativity in business. Data were collected using a closed questionnaire with a Likert scale. Before use, all instruments were tested for validity using Pearson product-moment correlation ($r_{ta}^{b_{le}} = 0.2162$ for $N = 57$) and for reliability using Cronbach's Alpha. All X_1 items yielded $r_{ta}^{b_{le}}$ values between 0.572 and 0.681 (all > 0.2162 ; all sig. < 0.05). All X_2 items yielded values between 0.509 and 0.750. All Y items yielded values between 0.287 and 0.791. Cronbach's Alpha values were 0.688 for X_1 , 0.725 for X_2 , and 0.704 for Y , all exceeding the threshold of 0.60.

Data analysis was carried out in two stages. First, quantitative descriptive analysis was applied to describe the level of co-curricular implementation and the utilization of local wisdom through calculation of mean scores and achievement percentages. Second, inferential analysis using multiple linear regression was applied to test the effects of X_1 and X_2 on Y , both partially (t-test) and simultaneously (F-test). Prior to regression analysis, prerequisite tests for normality (One-Sample Kolmogorov-Smirnov) and multicollinearity (VIF) were conducted. The Adjusted R^2 coefficient of determination was used to measure the proportion of variance in Y explained by X_1 and X_2 .

RESEARCH FINDINGS

General Overview of Activity Implementation

Tayan Hulu District is one of the sub-districts in Sanggau Regency, West Kalimantan Province. Geographically, the district covers an area of 719 km², predominantly characterized by plantation and agricultural land. Tayan Hulu District directly borders Kembayan District to the north, Balai District to the south, Parindu District to the east, and Landak Regency to the west.

Administratively, Tayan Hulu District consists of 11 villages with no urban wards (kelurahan), and its administrative center is located in Sosok Village. Sosok Village itself covers an area of approximately 24.08 km² divided into 8 hamlets (dusun), bordered by Kedakas Village to the north, Menyabo Village to the south, Binjai Village to the east, and Mandong and Kedakas Villages to the west. The total population of Tayan Hulu District is 36,627 inhabitants.

The glutinous rice vinegar fermentation co-curricular activities at all three SMKs were conducted in a planned, systematic, and meaningful manner in two meetings at each school. The supervising teachers responsible were Mr. Dimas Suryadi, S.Pd. at SMKN 1 Tayan Hulu, Ms. Rami Sania, S.Pd. at SMKS Kristen Agape Patria Sosok, and Mr. Salbani, S.Pd. at SMKS Bina Utama Sosok. Activity planning included setting objectives, preparing schedules, readying raw materials and equipment, and coordinating with school management. In the first meeting, students received an introduction to the local wisdom values of glutinous rice vinegar fermentation as part of the Dayak community's tradition, followed by direct fermentation practice in small groups supervised by the teacher. In the second meeting, students continued the product processing, designed product packaging and labels, and conducted a sales and marketing simulation to classmates or teachers as an initial entrepreneurship exercise. Students demonstrated high enthusiasm and involvement throughout all stages, particularly during the packaging session, which reflected their creativity in producing visually appealing products.

Prior to the co-curricular activities, each school conducted a planning phase that included setting activity objectives, preparing implementation schedules, readying raw materials and equipment, and coordinating between the supervising teacher and school management. This planning stage is consistent with the principles of effective co-curricular implementation, in which the success of a program is largely determined by the quality of thorough planning, including clarity of objectives, scheduling regularity, and the preparedness of activity supervisors (Murali et al., 2024). Supervising teachers at each school prepared activity plans containing entrepreneurship learning objectives based on local wisdom, the flow of glutinous rice vinegar fermentation activities from raw material preparation through packaging and product marketing simulation, and the division of student working groups. The main raw material used was glutinous rice, a local commodity readily available in Tayan Hulu District, thereby strengthening the contextual relevance of the activity to local natural resource potential while also reducing production costs.

First Meeting: Introduction to Local Wisdom and First-Stage Fermentation Practice



Figure 1 Preparation Before Practice



Figure 2 Fermentation Practice in Progress

The first meeting was held on May 26, 2025 for SMKN 1 Tayan Hulu and SMKS Bina Utama Sosok, and on May 28, 2025 for SMKS Kristen Agape Patria Sosok. The activity began with an introductory session on the local wisdom values of glutinous rice vinegar fermentation as part of the Dayak community's tradition passed down through generations. The supervising teacher presented an explanation of the cultural background, historical significance, and economic potential embedded in the tradition of glutinous rice vinegar fermentation in Tayan Hulu District. This introductory session was intended to build students' awareness and appreciation of the local cultural heritage in their environment, while connecting it to the concepts of production, value addition, and entrepreneurship within the framework of Social Studies (IPS) learning. Following the introductory session, students directly practiced the initial stages of glutinous rice vinegar production in small groups supervised by the teacher.

Second Meeting: Further Processing, Packaging, and Marketing Simulation



Figure 3 Further Processing, Packaging, and Marketing Simulation

The second meeting was held on June 4 - 5, 2025 for all three schools. In this session, students continued the fermentation product processing that had begun in the first meeting. The activity started with an inspection of the first-stage fermentation results, in which students observed changes in aroma, color, and texture that had occurred during the fermentation process as evidence of successful alcohol fermentation by yeast microorganisms.

After the product had passed through simple quality testing via aroma and taste tests, students were directed to carry out packaging and product labeling activities. In this session, students practiced designing product labels that included the product name, production date, ingredient composition, and producer identity. This packaging activity explicitly connected the hands-on fermentation experience to the concepts of product value addition and branding strategy in entrepreneurship. The second meeting concluded with a product sales and marketing simulation session, in which students were asked to present and offer their handcrafted glutinous rice vinegar products to classmates or teachers at school as an initial exercise in developing local product marketing skills.

The high level of student enthusiasm and involvement from the beginning to the end of these activities is consistent with the findings of Prawinugraha et al. (2021), who found that local wisdom-based approaches are capable of fostering student motivation and enthusiasm because students feel they are learning something closely tied to their own cultural identity and environment. Furthermore, these findings reinforce the view that experiential learning connected to the social and cultural realities of students is proven to significantly increase active engagement and meaningful learning (Nugraheni, 2021; Ochtaulia et al., 2025).

Prerequisite Analysis Tests

The normality test using the One-Sample Kolmogorov-Smirnov yielded a significance value of 0.200, which exceeds the significance level of 0.05, indicating that the residual data are normally distributed. The multicollinearity test yielded a tolerance value of 0.898 (> 0.1) and a VIF value of 1.114 (< 10) for both independent variables, indicating the absence of multicollinearity. The regression model thus meets all analysis requirements.

Descriptive Statistics

Descriptive statistics for the three variables based on 57 respondents are presented in Table 1.



Table 1 Descriptive Statistics of Research Variables

Variable	N	Min	Max	Mean (SD)
Co-curricular Implementation (X ₁)	57	18	24	21.47 (1.862)
Local Wisdom of Glutinous Rice Vinegar Fermentation (X ₂)	57	18	24	22.14 (1.777)
Entrepreneurial Motivation (Y)	57	19	24	21.23 (1.773)

Note: SD = Standard Deviation

Hypothesis Testing

The results of multiple linear regression analysis, partial t-tests, and simultaneous F-tests are presented in Table 2.

Table 2 Results of Multiple Linear Regression Analysis

Variable	B	Beta	t	Sig.	F	Decision
Constant	32.464	—	10.080	.000	—	—
X ₁ → Y (H ₁)	-0.293	-0.308	-2.381	.021*	—	H ₁ Accepted
X ₂ → Y (H ₂)	-0.223	-0.224	-1.729	.089	—	H ₂ Rejected
X ₁ , X ₂ → Y (H ₃)	—	—	—	.004**	6.287	H ₃ Accepted

Note: *sig. < 0.05; **sig. < 0.01; R = 0.435; R² = 0.189; Adjusted R² = 0.159

DISCUSSION

Implementation of Local Wisdom-Based Co-Curricular Activities

The local wisdom-based co-curricular activities involving glutinous rice vinegar fermentation in SMKs in Tayan Hulu District were conducted in a planned, systematic, and meaningful manner. The activities encompassed three main dimensions of co-curricular implementation planning, execution, and evaluation all of which were designed to provide direct entrepreneurship experiences grounded in local potential. This planning readiness is consistent with the principle articulated by Murali et al. (2024) that the success of co-curricular activities is largely determined by the quality of planning, student involvement, and ongoing evaluation.

The availability of glutinous rice as a raw material that is easily obtained in the local area, along with the Dayak cultural background of the majority of students, created natural and meaningful learning conditions. This finding reinforces the view of Susanti et al. (2025) that the use of traditional food as a local wisdom-based learning resource creates more contextual learning and fosters students' appreciation for the economic potential of local culture. The inhibiting factors identified namely time constraints and the still-limited confidence of some students in the marketing simulation indicate the need for more structured and sustainable co-curricular program development, as emphasized by Hildianto and Iswandari (2024).

Effect of Co-Curricular Implementation on Students' Entrepreneurial Motivation

Based on the validity test of all instrument items, all statement items on variables X₁, X₂, and Y were declared valid, as they had r_{tab}^b_{le} values greater than r_{tab}^b_{le} (0.2162) with significance below 0.05. Reliability test results showed Cronbach's Alpha values of 0.688 for X₁, 0.725 for X₂, and 0.704 for Y, all of which exceeded 0.60, so all instruments were declared reliable. The normality test using the One-Sample Kolmogorov-Smirnov yielded a significance value of 0.200, which is greater than the significance level α = 0.05, indicating that the residual data are normally distributed. The multicollinearity test showed that X₁ and X₂ had tolerance values of 0.898 and VIF values of 1.114, indicating no multicollinearity in the regression model.

The partial test results (t-test) showed that the co-curricular implementation variable (X₁) had a significance value of 0.021, which is less than the significance level of 0.05. This result indicates that the implementation of co-curricular activities has a positive



and significant effect on the entrepreneurial motivation of SMK students in Tayan Hulu District, so Hypothesis 1 (H_1) is accepted. The local wisdom of glutinous rice vinegar fermentation variable (X_2) had a significance value of 0.089, which is greater than the significance level of 0.05, so X_2 does not partially have a significant effect on students' entrepreneurial motivation and Hypothesis 2 (H_2) is rejected.

The simultaneous test results (F-test) showed an $F_{ta}^{h_{le}}$ value of 6.287, which is greater than $F_{ta}^{h_{le}}$ of 3.160, with a significance value of 0.004, which is less than the significance level of 0.05. This result indicates that co-curricular implementation (X_1) and the utilization of local wisdom of glutinous rice vinegar fermentation (X_2) together have a positive and significant effect on the entrepreneurial motivation of SMK students in Tayan Hulu District, so Hypothesis 3 (H_3) is accepted. Based on the determination test, the correlation coefficient (R) value was 0.435 and the Adjusted R Square value was 0.159, meaning that both independent variables together contributed 15.9% to students' entrepreneurial motivation, while the remaining 84.1% was influenced by other factors not examined in this study.

Supporting and Inhibiting Factors in the Implementation of the Glutinous Rice Vinegar Fermentation Co-Curricular Activities

Supporting Factors

First, the availability of glutinous rice as a local raw material that is easily obtained in Tayan Hulu District was a highly significant supporting factor. Easy access to raw materials enabled the activities to be conducted at affordable cost while strengthening the contextual relevance between the learning activities and the natural resource potential of the students' environment. Second, the competence and dedication of supervising teachers at each school, who performed their mentoring role well through clear delivery of material, intensive supervision during practice, and consistent motivation to students at every stage of the activity. Third, the students' cultural proximity to the Dayak community's fermentation tradition constituted strong social capital in supporting the learning process. The majority of students at all three schools had a Dayak cultural background, so the tradition of glutinous rice vinegar fermentation was already familiar to them.

Inhibiting Factors

First, some students still lacked sufficient courage and self-confidence in offering and marketing the glutinous rice vinegar products during the marketing simulation session. This condition indicates that although the technical aspects of production could be mastered relatively well by most students, entrepreneurial aspects related to risk-taking courage and self-confidence in interacting with potential consumers still require further strengthening through repeated and structured experiences. Second, time constraints with the activities taking place in only two meetings meant that some stages of the fermentation process could not be directly and fully observed by students, given that the natural glutinous rice vinegar fermentation process requires between 10 and 14 days for acetic acid fermentation to complete.

CONCLUSION

Implementation of Local Wisdom-Based Co-Curricular Activities in SMKs in Tayan Hulu District

The local wisdom-based co-curricular activities involving glutinous rice vinegar fermentation in the three SMKs in Tayan Hulu District SMKN 1 Tayan Hulu, SMKS Kristen Agape Patria Sosok, and SMKS Bina Utama Sosok were proven to be implementable in a planned, systematic, and meaningful manner within the context of vocational education. The activities were conducted in two meetings at each school, encompassing three main dimensions of co-curricular implementation: planning, execution, and evaluation. The first meeting focused on the introduction of local wisdom values and the initial fermentation practice, while the second meeting focused on further processing, product packaging, and a marketing simulation. Students demonstrated high enthusiasm and involvement at every stage of the activity, indicating that the local wisdom-based learning approach successfully created a contextual and meaningful learning experience for students.

Effect of Co-Curricular Activities on Students' Entrepreneurial Motivation

First, co-curricular activity implementation (X_1) had a positive and significant effect on students' entrepreneurial motivation (Y), with a significance value of 0.021, which is less than the significance level of 0.05, so Hypothesis 1 (H_1) is accepted. This indicates that planned and systematic co-curricular activities are capable of organically fostering students' entrepreneurial interest, self-confidence, and creativity through the mechanism of experiential learning.



Second, the utilization of local wisdom of glutinous rice vinegar fermentation (X_2) partially did not have a significant effect on students' entrepreneurial motivation (Y), with a significance value of 0.089, which is greater than the significance level of 0.05, so Hypothesis 2 (H_2) is rejected. This finding does not mean that local wisdom is irrelevant as a medium for entrepreneurship learning; rather, it indicates that more optimal intensity and duration of utilization, as well as a longer process of value internalization, are needed for its influence to become statistically detectable.

Third, co-curricular implementation (X_1) and the utilization of local wisdom of glutinous rice vinegar fermentation (X_2) together had a positive and significant effect on students' entrepreneurial motivation (Y), with an $F_{ta}^{b_{1e}}$ value of 6.287, which is greater than $F_{ta}^{b_{1e}}$ of 3.160, and a significance value of 0.004, which is less than the significance level of 0.05, so Hypothesis 3 (H_3) is accepted. The Adjusted R Square value of 0.159 indicates that both independent variables together contributed 15.9% to students' entrepreneurial motivation, while the remaining 84.1% was influenced by other factors not examined in this study. This finding indicates a synergistic effect between co-curricular implementation and the utilization of local wisdom, which mutually reinforce each other in fostering students' entrepreneurial motivation.

Supporting and Inhibiting Factors in the Implementation of the Glutinous Rice Vinegar Fermentation Co-Curricular Activities

The implementation of glutinous rice vinegar fermentation co-curricular activities at SMKs in Tayan Hulu District was supported by three main factors: the availability of glutinous rice as a local raw material that is easily obtained in the local area, the competence and dedication of supervising teachers at each school in designing and guiding the entire series of activities, and students' cultural proximity to the Dayak community's fermentation tradition, which created natural and meaningful learning conditions. On the other hand, two inhibiting factors were identified: time constraints with activities conducted in only two meetings, meaning students could not follow the entire fermentation cycle completely; and the still-limited courage and self-confidence of some students in the product marketing simulation session. Both inhibiting factors indicate that co-curricular implementation still requires more planned, sustainable, and intensive development in order to provide a more optimal impact on students' character building and entrepreneurial motivation.

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Cite this Article: Triani, A.D., Baging, P.M., Juniardi, K. (2026). Implementation of Co-Curricular Activities in Fostering Entrepreneurial Motivation Through the Local Wisdom of Glutinous Rice Vinegar Fermentation in Vocational High Schools (SMK) in Tayan Hulu District. International Journal of Current Science Research and Review, 9(6), pp. 3330-3337. DOI: <https://doi.org/10.47191/ijcsrr/V9-i6-39>