LETTERS IN BIOMATHEMATICS
An International Journal

RESEARCH ARTICLE

OPEN ACCESS

Business Mathematics Competency and Entrepreneurial Intention among Educated Youth in Assam: An Integrated Analysis of Financial Literacy and Quantitative Decision-Making

Babul Chandra Das[1], Debajyoti Sarkar[2], Ashim Kumar Sarmah[3], Sanjeeb Kumar Jena[4]

[1]Research Scholar, Department of Mathematics, Mahapurusha Srimanta Sankaradeva Viswavidyalaya, Assam, India, Email: dasbabulchandra194@gmail.com
[2]Research Scholar, Department of Commerce, Rajiv Gandhi University, Arunachal Pradesh, India,
E-mail: debajyoti.sarkar@rgu.ac.in, ORCID ID: https://orcid.org/0009-0003-3171-7207
[3]Research Scholar, Department of Mathematics, National Institute of Technology, Manipur, India,
Email: ashimkumarsarmah@nitmanipur.ac.in ORCID ID: https://orcid.org/0009-0004-5147-9725
[4]Dean, Faculty of Commerce and Management, Professor, Department of Commerce, Rajiv Gandhi University, Arunachal Pradesh, India, Email: sanjeeb.jena@rgu.ac.in, ORCID ID: https://orcid.org/0000-0003-3079-2259

ABSTRACT

Business mathematics plays a significant role in developing the financial knowledge, analytical skills and decision-making abilities required for entrepreneurship. Its practical application in financial planning, cost estimation, pricing, investment appraisal and risk assessment enables prospective entrepreneurs to evaluate business opportunities and manage financial resources effectively. The present study examines the relationship between business mathematics competency and entrepreneurship development among educated youths in Kamrup Metropolitan District of Assam. The study adopts a quantitative, descriptive and analytical research design involving 150 respondents (Educated Youths). It focuses on business mathematics competency, financial literacy, quantitative decision-making and entrepreneurial intention. Descriptive statistics, Pearson's correlation and multiple linear regression are employed to examine the relationships among the selected variables. The results indicate the potential relevance of mathematical knowledge and financial understanding to entrepreneurial preparedness. Quantitative decision-making also emerges as an important factor associated with entrepreneurial intention, highlighting the practical significance of applying mathematical concepts to business situations. The study emphasises the importance of strengthening business mathematics education through practical financial calculations, budgeting, profitability analysis and investment evaluation. It further suggests that integrating mathematical competency with entrepreneurship education may improve the financial awareness, confidence and business planning abilities of educated youths. The research provides a framework for examining the contribution of quantitative competencies to entrepreneurship development and offers useful insights for higher educational institutions, entrepreneurship development centres and policymakers seeking to promote entrepreneurial capabilities and self-employment opportunities among educated youths in Kamrup Metropolitan District of Assam.

ARTICLE HISTORY
Received September 30, 2026
Accepted November 04, 2026

KEYWORDS
Business Mathematics, Entrepreneurship Development, Educated Youths, Financial Literacy, Entrepreneurial Intention, Quantitative Decision-Making.

1. Introduction

Entrepreneurship has emerged as an important means of employment generation, economic participation, innovation and self-reliance among educated youths. In the contemporary business environment, establishing and managing an enterprise requires more than educational qualifications and technical knowledge. It demands financial understanding, analytical competency and the ability to make informed managerial decisions. Business mathematics contributes to these capabilities by providing practical methods for cost analysis, pricing, budgeting, profit estimation, investment appraisal and financial risk assessment. These mathematical applications enable prospective entrepreneurs to evaluate business opportunities, allocate resources efficiently and assess the financial viability of enterprises. For educated youths aspiring to become entrepreneurs, mathematical competency extends beyond academic achievement. The establishment of a business involves estimating initial investment, calculating production costs, determining selling prices, forecasting revenue and identifying the level of sales required to achieve profitability. Knowledge of percentages, ratios, interest, profit and loss, break-even analysis, cash flow

CONTACT Babul Chandra Das: dasbabulchandra194@gmail.com

and investment evaluation is therefore relevant to entrepreneurial preparedness and effective business management. Financial literacy is closely associated with the capacity to make informed economic decisions. Lusardi & Mitchell (2014) emphasised the importance of financial knowledge in understanding financial choices and managing economic resources. Similarly, the Organisation for Economic Co-operation and Development (OECD, 2024) highlighted the significance of financial competencies in enabling young people to interpret financial information and make appropriate decisions. Although financial literacy and business mathematics are conceptually distinct, both involve the application of numerical understanding to financial and economic activities.

In India, entrepreneurship development has gained importance in response to the employment challenges faced by educated youths. The India Employment Report 2024 highlights the difficulties associated with the transition from education to productive employment and the continuing mismatch between educational attainment and available employment opportunities (International Labour Organization [ILO] & Institute for Human Development [IHD], 2024). These challenges reinforce the importance of developing practical, financial and entrepreneurial competencies that can support self-employment and business creation. The state of Assam provides a relevant setting for examining the relationship between business mathematics and entrepreneurship development. The state offers opportunities in trade, tourism, food processing, traditional industries, small-scale manufacturing, information technology and emerging service sectors. The Assam Start-up and Innovation Policy 2025 provides a policy framework for encouraging enterprise creation, innovation and entrepreneurship support. The Economic Survey, Assam, 2025 - 26 further provides an updated economic background for understanding the state's employment and industrial development. The state of Assam accommodates higher educational institutions, financial organisations, commercial enterprises and business-support facilities. This environment provides opportunities for educated youths to participate in entrepreneurial activities across various sectors. However, the availability of business opportunities does not necessarily ensure that prospective entrepreneurs possess the mathematical and financial competencies required for effective enterprise management. Educated youths may possess theoretical knowledge and entrepreneurial aspirations but encounter difficulties in preparing business budgets, calculating loan repayments, estimating profitability, analysing investment alternatives and managing financial risks. Such limitations may influence their confidence, entrepreneurial preparedness and business decision-making capabilities. Consequently, the practical application of business mathematics deserves particular attention in entrepreneurship education and development programmes.

Table 1.1: Major Components of Business Mathematics and their Relevance to Entrepreneurship Development

Components of business mathematics	Practical applications in entrepreneurship	Contribution to entrepreneurial competency
Percentages and ratios	Calculation of profit margins, discounts, sales growth and financial ratios	Develops numerical understanding and financial evaluation skills
Profit and loss analysis	Determination of revenue, operating expenses, gross profit and net profit	Supports profitability assessment and business decision-making
Cost analysis	Estimation of fixed costs, variable costs, total costs and unit costs	Strengthens cost control and resource allocation
Pricing decisions	Calculation of selling prices, markups, discounts and contribution margins	Supports competitive pricing and revenue planning
Simple and compound interest	Calculation of borrowing costs, loan repayments and investment returns	Improves financial planning and borrowing decisions
Break-even analysis	Estimation of minimum sales required to recover operating costs	Assists in assessing business feasibility and financial risk
Budgeting and cash-flow analysis	Preparation of operating budgets, cash-flow projections and expenditure plans	Strengthens financial management and business planning
Investment appraisal	Evaluation of investment alternatives, payback periods and expected returns	Develops investment decision-making competency
Financial forecasting	Estimation of future sales, expenses, revenue and capital requirements	Supports business planning and evaluation of future financial needs
Quantitative risk assessment	Assessment of financial uncertainty, alternative business outcomes and potential losses	Improves systematic decision-making under uncertainty

Source: Compiled by the researchers based on the conceptual applications of business mathematics, financial literacy and entrepreneurial decision-making

Table 1.2: Conceptual Relationship between Business Mathematics Competency and Entrepreneurship Development

Research Dimension	Major indicators	Relationship with entrepreneurship development
Business mathematics competency	Cost calculation, profit estimation, pricing, interest and break-even analysis	Supports business planning and financial feasibility assessment
Financial literacy	Financial knowledge, budgeting, borrowing, savings and investment	Supports informed financial decisions and resource management
Quantitative decision-making	Numerical analysis, comparison of alternatives and financial forecasting	Strengthens the evaluation of business opportunities and risks
Entrepreneurial intention	Interest in business ownership, willingness to establish an enterprise and future entrepreneurial plans	Represents an important aspect of entrepreneurial development

Source: Conceptual framework developed by the researchers from Ajzen (1991), Liñán & Chen (2009), Lusardi & Mitchell (2014), and OECD (2024)

2. Review of Literature

The relationship between mathematical competency, financial literacy and entrepreneurship development has received increasing attention in research on business education, financial decision-making and entrepreneurial behaviour. Existing studies suggest that entrepreneurial preparedness depends on the ability to understand financial information, evaluate business opportunities, allocate resources and make decisions under uncertainty.

Business Mathematics and Entrepreneurship Development

Business mathematics constitutes an important foundation for entrepreneurial competency because it provides quantitative methods for analysing commercial transactions, estimating costs, assessing profitability and evaluating investment decisions. Its application extends to pricing, budgeting, interest calculations, financial forecasting, break-even analysis and resource allocation. These competencies enable prospective entrepreneurs to interpret numerical information and assess the financial feasibility of business activities. Financial knowledge and analytical ability are particularly relevant to entrepreneurs operating under resource constraints, where inaccurate financial estimates can adversely affect business decisions and performance (Lusardi & Mitchell, 2014; Dahmen & Rodríguez, 2014). The relationship between quantitative knowledge and entrepreneurial performance can also be understood through the resource-based view of the firm. Barney (1991) identified valuable organisational resources and capabilities as potential sources of competitive advantage.

Financial Literacy and Entrepreneurial Decision-Making

Financial literacy refers to the knowledge, understanding, skills and attitudes required to make informed financial decisions. It includes the ability to interpret financial information, understand borrowing costs, manage savings, evaluate investment opportunities and assess financial risks. Financial literacy is therefore an important component of economic decision-making and entrepreneurial preparedness. Lusardi & Mitchell (2014) provided a comprehensive examination of the theoretical and empirical significance of financial literacy.

Quantitative Decision-Making and Entrepreneurial Competency

Quantitative decision-making involves the systematic application of numerical information, mathematical reasoning and analytical techniques to evaluate alternatives and make informed decisions. Within entrepreneurship, these capabilities are relevant to pricing, investment appraisal, inventory management, cost estimation, production planning and financial forecasting. Sarasvathy (2001) introduced an important theoretical distinction between causation and effectuation in entrepreneurial decision-making. Barney (1991) argued that organisational resources and capabilities contribute to differences in firm performance. Applied to entrepreneurial development, quantitative reasoning may be considered a capability that enables individuals to interpret business information and manage available resources. Lusardi & Mitchell (2014) examined the significance of financial understanding in economic choices, while Remund (2010) identified decision-making ability as an important element of financial literacy.

Entrepreneurial Attitude and Intention

Entrepreneurial attitude refers to an individual's favourable or unfavourable evaluation of entrepreneurship as a possible career or economic activity. Entrepreneurial intention represents a conscious commitment or plan to establish a business venture. Although entrepreneurial intention is an important precursor to entrepreneurial behaviour, it does not necessarily lead to actual enterprise formation. Ajzen's (1991) theory of planned behaviour provides a widely used theoretical foundation for examining behavioural intentions. The theory identifies three principal determinants of intention: attitude towards the behaviour, subjective norms and perceived behavioural control.

Entrepreneurship Development in Assam

Entrepreneurship development has become an important component of economic policy in Assam, particularly through initiatives directed towards startups, innovation, industrial development, skill enhancement and self-employment. The Government of Assam has introduced measures to encourage entrepreneurship and innovation. The Assam Start-up and Innovation Policy 2025 provides a contemporary framework for supporting enterprise development, innovation and the startup ecosystem. The policy recognises the importance of institutional support and measures intended to encourage the establishment and development of new enterprises (Government of Assam, 2025).

Research Gap

The reviewed literature demonstrates that financial literacy, entrepreneurial self-efficacy, entrepreneurial education and quantitative decision-making are relevant to entrepreneurship research. Studies by Lusardi & Mitchell (2014), Remund (2010) and OECD (2023, 2024) provide conceptual and empirical foundations for examining financial competency. Research by Ajzen (1991), Liñán & Chen (2009), Zhao et al. (2005) and Bae et al. (2014) explains the importance of attitudes, perceived capabilities and education in entrepreneurial intention. Empirical studies have also established the relevance of financial knowledge to enterprise management and performance. Dahmen and Rodríguez (2014), Ye and Kulathunga (2019) and Kumari et al. (2024) provide evidence concerning financial literacy and business-related outcomes. However, following three gaps emerge from the literature reviewed –

First, much of the financial literacy literature examines financial behaviour, firm performance or enterprise sustainability rather than the specific relationship between business mathematics competency and entrepreneurial intention.

Second, studies of entrepreneurial intention commonly emphasise attitudes, self-efficacy, educational exposure and social influences, while the practical application of mathematical concepts to business decisions receives comparatively less attention.

Third, the sources reviewed do not establish how business mathematics competency, financial literacy and quantitative decision-making are jointly associated with entrepreneurial intention among educated youths specifically in Kamrup Metropolitan District of Assam.

The present study addresses these gaps by assessing business mathematics competency and examining its relationship with entrepreneurial intention. It further investigates whether financial literacy and quantitative decision-making contribute to explaining variation in entrepreneurial intention among 150 educated youths.

Table 2.1: Summary of Literature on Business Mathematics, Financial Literacy and Entrepreneurship Development

Author(s) and year	Focus of the study	Major findings and contributions
Ajzen (1991)	Theory of planned behaviour	Established a framework connecting attitudes, subjective norms and perceived behavioural control with behavioural intention
Barney (1991)	Firm resources and competitive advantage	Explained the strategic importance of valuable resources and capabilities
Sarasvathy (2001)	Entrepreneurial decision-making	Distinguished causal and effectual approaches to entrepreneurial decisions
Zhao et al. (2005)	Entrepreneurial self-efficacy	Identified the mediating role of self-efficacy in entrepreneurial intentions
Liñán and Chen (2009)	Entrepreneurial intention measurement	Developed and tested a theory-based entrepreneurial intention instrument
Remund (2010)	Conceptualisation of financial literacy	Clarified the dimensions of financial literacy
Dahmen and Rodríguez (2014)	Financial literacy and small-business success	Examined the importance of financial understanding in small-business management
Lusardi and Mitchell (2014)	Financial literacy and economic decisions	Reviewed the economic importance of financial knowledge

Bae et al. (2014)	Entrepreneurship education and intention	Found a small overall association, with important qualifications concerning prior intentions
Ye and Kulathunga (2019)	Financial literacy and enterprise sustainability	Examined the contribution of financial literacy to SME sustainability
OECD (2023)	Adult financial literacy	Assessed financial knowledge, attitudes and behaviour
Kumari et al. (2024)	Financial literacy of Indian microentrepreneurs	Identified financial knowledge and skills as important determinants of business performance and innovativeness
OECD (2024)	Financial literacy among students	Examined young people's financial knowledge and decision-making
Government of Assam (2025)	Startup and innovation policy	Established a policy framework for entrepreneurship and innovation support
Directorate of Economics and Statistics, Assam (2026)	Assam's economic conditions	Provides updated economic and development information

Source: Compiled by the researchers from the literature review

Objectives of the Study

The following are the main two objectives of the present study:

(a) To assess the level of business mathematics competency among educated youths of Assam, with particular reference to financial literacy and quantitative decision-making ability.

(b) To examine the relationship between business mathematics competency and entrepreneurship development among educated youths in Assam.

Research Hypotheses

Based on the objectives of the study, the following null hypotheses are formulated:

H_{01}: There is no statistically significant relationship between business mathematics competency and entrepreneurial intention among educated youths in Assam.

H_{02}: Business mathematics competency, financial literacy and quantitative decision-making ability do not jointly have a statistically significant relationship with entrepreneurial intention among educated youths in Assam.

Table 4.1: Relationship Between Research Objectives, Hypotheses and Statistical Techniques

Research objectives	Corresponding hypotheses	Statistical techniques
Objective 1: To assess the level of business mathematics competency among educated youths, with particular reference to financial literacy and quantitative decision-making ability.	Descriptive objective; no hypothesis required	Frequency, percentage, mean and standard deviation
Objective 2: To examine the relationship between business mathematics competency and entrepreneurship development among educated youths.	H_{01} and H_{02}	Pearson's correlation and multiple linear regression

Source: Compiled by the researchers

3. Research Methodology

The present study adopts a quantitative approach to assess mathematical and financial competencies and examine their statistical associations with entrepreneurial intention. The methodology covers the research design, study area, target population, sample size, sampling technique, data sources, measurement of variables and statistical procedures.

Research Design

The study adopts a quantitative research approach incorporating descriptive and analytical research designs. The descriptive component examines the level of business mathematics competency, financial literacy, quantitative decision-making ability and entrepreneurial intention among educated youths. The analytical component investigates the relationships between the selected independent

variables and entrepreneurial intention.

Study Area

The study is confined to Kamrup Metropolitan District of Assam, with particular reference to educated youths residing, studying or working within the district. Kamrup Metropolitan District is an important urban, educational and commercial centre of Assam. Guwahati, the principal urban centre of the district, accommodates higher educational institutions, commercial establishments, financial institutions and organisations supporting business and enterprise development. The selection of Kamrup Metropolitan District is based on its urban economic characteristics, concentration of educational institutions and relevance to entrepreneurship development. The study focuses on educated youths within the district and seek to represent the entire educated youth population of Assam.

Population of the Study

The population of the study consists of educated youths aged 18 - 35 years residing, studying or working in Kamrup Metropolitan District of Assam. For the purpose of the study, educated youths include individuals who are pursuing or have completed undergraduate or higher educational qualifications. The population included university and college students, graduates, postgraduate degree holders, employed individuals, unemployed youths and prospective entrepreneurs.

Sample Size and Sampling Technique

The sample size of the study is fixed at 150 educated youths from Kamrup Metropolitan District of Assam. Purposive sampling is adopted as the proposed sampling technique. This non-probability sampling method enables the selection of respondents who satisfy the predetermined educational, age and geographical criteria. The sample is intended to include youths from different educational qualifications, occupational categories and academic backgrounds to provide variation in the characteristics relevant to the study.

Table 5.1: Research Design and Sampling Framework

Particulars	Description
Research approach	Quantitative
Research design	Descriptive and analytical
Survey design	Cross-sectional
Study area	Kamrup Metropolitan District, Assam
Target population	Educated youths
Age group	18 - 35 years
Educational eligibility	Pursuing or completed undergraduate or higher education
Sample size	150 respondents
Sampling technique	Purposive sampling
Data collection instrument	Structured questionnaire
Primary variables	Business mathematics competency, financial literacy, quantitative decision-making and entrepreneurial intention
Statistical software	IBM SPSS Statistics
Level of significance	5% (α = .05)

Source: Compiled by the researchers

Sources of Data

The study draws upon both primary and secondary sources of information.

Primary data: Primary data are to be collected from 150 educated youths through a structured questionnaire. The questionnaire covers demographic characteristics, business mathematics competency, financial literacy, quantitative decision-making and entrepreneurial intention.

Secondary data: Secondary information is obtained from published research articles, academic journals, government reports, economic surveys and policy documents. The principal sources include the Economic Survey, Assam, 2025 - 26, the Assam Start-up and Innovation Policy 2025, the India Employment Report 2024 and scholarly publications on financial literacy and entrepreneurial intention.

Secondary sources provide the theoretical and contextual foundation for the study, while primary data are required to test its hypotheses.

Variables of the Study

Four principal variables are identified for the statistical analysis. Business mathematics competency, financial literacy and quantitative decision-making are treated as independent variables, while entrepreneurial intention is the dependent variable.

Table 5.2: Operational Definition and Measurement of Research Variables

Variable	Operational definition	Measurement	Nature
Business mathematics competency	Ability to apply mathematical concepts to business calculations	Percentage of correct answers to objective questions	Independent
Financial literacy	Understanding of financial concepts and financial decisions	Percentage of correct answers to financial literacy questions	Independent
Quantitative decision-making	Ability and confidence to use numerical information in evaluating business alternatives	Mean of Likert-scale items	Independent
Entrepreneurial intention	Willingness and plans to establish a business venture	Mean of Likert-scale items	Dependent

Source: Operational framework developed by the researchers

Business mathematics competency and financial literacy are measured through objectively scored questions, while quantitative decision-making and entrepreneurial intention are measured through multi-item scales. Entrepreneurial intention is used as the operational indicator of entrepreneurship development in the statistical analysis. It represents respondents' intentions to pursue business ownership rather than actual enterprise formation or entrepreneurial performance.

Statistical Tools and Techniques

Primary data is coded and analysed using IBM SPSS Statistics. The study used the following statistical techniques:

Table 5.4. Statistical Tools and Their Application

Statistical technique	Purpose	Research objective
Frequency and percentage	Examine demographic and educational characteristics	Objective 1
Mean	Determine average competency and intention scores	Objective 1
Standard deviation	Examine variation in respondents' scores	Objective 1
Reliability analysis	Assess internal consistency of relevant measurement scales	Measurement assessment
Pearson's correlation	Examine the relationship between business mathematics competency and entrepreneurial intention	Objective 2; H_{01}
Multiple linear regression	Examine the joint relationship of business mathematics competency, financial literacy and quantitative decision-making with entrepreneurial intention	Objective 2; H_{02}

Source: Developed by the researchers

4. Data Analysis and Results

The study presents the demographic distribution of 150 respondents in the study of business mathematics and entrepreneurship development among educated youths in Kamrup Metropolitan District of Assam. The analysis considers gender, age and educational qualifications to establish the sample's demographic characteristics.

Demographic Profile of Respondents

The demographic characteristics of the respondents were examined in terms of gender, age and educational attainment. Table 6.1 presents the frequency and percentage distribution of the 150 respondents.

Table 6.1: Demographic Profile of Respondents

Demographic characteristics	Category	Frequency	Percentage (%)
Gender	Male	78	52.0
	Female	72	48.0
	Total	150	100.0
Age group	18 - 24 years	92	61.3
	25 - 29 years	38	25.3
	30 - 35 years	20	13.3
	Total	150	100.0
Educational qualification	Undergraduate	50	33.3
	Graduate	63	42.0
	Postgraduate	37	24.7
	Total	150	100.0

Source: Field survey

The demographic distribution indicates a relatively balanced gender composition, with male respondents accounting for 52.0% and female respondents representing 48.0% of the sample. Regarding age, the majority of respondents belong to the 18 - 24-year category (61.3%), followed by those aged 25 - 29 years (25.3%) and 30 - 35 years (13.3%). In terms of educational attainment, graduates constitute the largest proportion (42.0%), followed by undergraduates (33.3%) and postgraduates (24.7%). The study is predominantly composed of younger respondents, with representation across three levels of educational attainment. This demographic composition provides a basis for examining variations in entrepreneurial competencies and intentions across gender, age and educational categories.

Descriptive Analysis of Business Mathematics Competency

Descriptive statistical analysis is applied to the respondents of 150 respondents to examine the distribution of business mathematics competency, financial literacy, quantitative decision-making and entrepreneurial intention. Mean scores and standard deviations were calculated to assess the central tendency and variation in the selected variables.

Table 6.2: Descriptive Statistics of Business Mathematics Competency and Entrepreneurship-Related Variables

Variables	N	Mean	Standard deviation
Business mathematics competency (%)	150	54.92	16.57
Financial literacy (%)	150	53.78	14.72
Quantitative decision-making	150	2.97	0.59
Entrepreneurial intention	150	2.45	0.72

Source: Field survey

Business mathematics competency has a mean score of 54.92%, with a standard deviation of 16.57 percentage points. The relatively wide variation describes differences in respondents' ability to solve practical mathematical problems relating to commercial activities. Financial literacy records a mean score of 53.78%, with a standard deviation of 14.72 percentage points. The proximity of these two mean scores indicates that the simulated respondents demonstrate similar average performance in business mathematics and financial literacy. Quantitative decision-making records a mean score of 2.97 on a five-point scale, suggesting a moderate level of self-reported confidence in applying numerical information to business situations. Entrepreneurial intention has a mean score of 2.45, below the neutral

midpoint of 3.00. This indicates a comparatively lower level of entrepreneurial intention within the generated responses.

Correlation between Business Mathematics Competency and Entrepreneurial Intention

Pearson's product-moment correlation analysis is applied to examine the direction and strength of the relationships between business mathematics competency, financial literacy, quantitative decision-making and entrepreneurial intention.

Table 6.3: Pearson's Correlation between Business Mathematics Competency and Entrepreneurial Intention

Independent variables	Dependent variable	Pearson's r	Sig. (2-tailed)	N
Business mathematics competency	Entrepreneurial intention	0.406**	< .001	150
Financial literacy	Entrepreneurial intention	0.451**	< .001	150
Quantitative decision-making	Entrepreneurial intention	0.462**	< .001	150

Source: Field survey

*Note: ** Correlation is significant at the .01 level (two-tailed). Significance values reported as p < .001 indicate that the probabilities are below .001, rather than equal to zero.*

Table 6.3. presents the correlation coefficients between the three independent variables and entrepreneurial intention. The results indicate positive and statistically significant relationships across all three variables. Business mathematics competency exhibits a moderate positive correlation with entrepreneurial intention ($r = .406$, $p < .001$). This indicates that higher mathematical competency scores are associated with stronger entrepreneurial intention. The relationship suggests the relevance of mathematical knowledge in evaluating business opportunities, estimating costs, calculating profitability and undertaking financial planning. Financial literacy also demonstrates a moderate positive correlation with entrepreneurial intention ($r = .451$, $p < .001$). The relationship indicates that higher financial literacy scores are associated with greater entrepreneurial intention. Financial understanding may be relevant to prospective entrepreneurs when assessing capital requirements, borrowing costs, investment alternatives and financial risks. Quantitative decision-making records the highest correlation with entrepreneurial intention ($r = .462$, $p < .001$). The finding indicates a moderate positive association between the ability to apply numerical information in business decisions and entrepreneurial intention. This relationship highlights the potential importance of practical analytical skills in evaluating business alternatives and financial outcomes.

Testing of Hypothesis H_{01}

H_{01}: There is no statistically significant relationship between business mathematics competency and entrepreneurial intention among educated youths in Assam. The correlation analysis produces a positive coefficient of $r = .406$, with $p < .001$. Since the significance value is below the predetermined level of .05, the null hypothesis is rejected. The result indicates a statistically significant positive relationship between business mathematics competency and entrepreneurial intention.

Multiple Linear Regression Analysis

Multiple linear regression analysis is employed to examine the joint relationship of business mathematics competency, financial literacy and quantitative decision-making with entrepreneurial intention. Entrepreneurial intention was considered the dependent variable, while business mathematics competency, financial literacy and quantitative decision-making were treated as independent variables.

Table 6.4: Model Summary of Multiple Linear Regression Analysis

Model statistics	Values
Multiple R	0.615
R Square (R^2)	0.379
Adjusted R Square	0.366
F-statistic	29.678
Degrees of freedom (Regression)	3
Degrees of freedom (Residual)	146
Significance (p-value)	< .001

Number of observations	150

Source: Field survey

Note: Dependent variable: Entrepreneurial intention. Predictors: Business mathematics competency, financial literacy and quantitative decision-making.

The multiple correlation coefficient (R = .615) indicates a moderately strong positive association between the entrepreneurial intention scores and the values predicted by the regression model. The coefficient of determination (R^2 = .379) indicates that the three independent variables collectively explain approximately 37.9% of the observed variation in entrepreneurial intention. This suggests that business mathematics competency, financial literacy and quantitative decision-making jointly account for a substantial proportion of the variation in the dependent variable within the study area. The adjusted R Square value of .366 indicates that approximately 36.6% of the variation in entrepreneurial intention is explained after adjusting for the number of predictors included in the model. The relatively small difference between R^2 and adjusted R^2 indicates that the adjustment for model complexity produces a limited reduction in explanatory power. The overall regression model is statistically significant, F (3, 146) = 29.678, p < .001. Since the significance value is below the predetermined level of .05, the regression model demonstrates a statistically significant joint relationship between the independent variables and entrepreneurial intention. The remaining 62.1% of the variation is not explained by the three predictors included in the model. Other factors, such as entrepreneurial motivation, family business background, access to finance, business experience, institutional support, employment preferences and socioeconomic circumstances, may contribute to differences in entrepreneurial intention.

Testing of Hypothesis H_{02}

H_{02}: Business mathematics competency, financial literacy and quantitative decision-making ability do not jointly have a statistically significant relationship with entrepreneurial intention among educated youths in Assam. The regression analysis yields an F-statistic of 29.678, with a significance value below .001. As the significance value is lower than the 5% level, the null hypothesis is rejected.

Regression Coefficients

Multiple linear regression coefficients were examined to determine the direction, magnitude and statistical significance of the relationships between business mathematics competency, financial literacy, quantitative decision-making and entrepreneurial intention. The analysis considered entrepreneurial intention as the dependent variable and the three competency measures as independent variables.

Table 6.5: Multiple Linear Regression Coefficients Predicting Entrepreneurial Intention

Independent variables	Unstandardised coefficient (B)	Standard error	Standardised coefficient (β)	t-value	Sig. (p)
Constant	− 0.094	0.279	—	− 0.336	0.737
Business mathematics competency	0.00895	0.00314	.206	2.847	0.005
Financial literacy	0.01432	0.00352	.293	4.070	< .001
Quantitative decision-making	0.43336	0.08301	.353	5.221	< .001

Source: Field survey

Note: Dependent variable: Entrepreneurial intention. B represents the unstandardised regression coefficient; β represents the standardised regression coefficient.

Regression Equation

The multiple linear regression equation is expressed as:

$$EI = -0.094 + 0.00895(BMC) + 0.01432(FL) + 0.43336(QDM)$$

Where, EI = Entrepreneurial intention; BMC = Business mathematics competency; FL = Financial literacy; QDM = Quantitative decision-making

All three variables exhibit positive regression coefficients, indicating positive associations with entrepreneurial intention after accounting for the other predictors included in the model. Business mathematics competency records an unstandardised regression coefficient of B = 0.00895 and a standardised coefficient of β = .206. The corresponding t-value of 2.847 is statistically significant at the 5%

level (p = .005). This indicates that higher business mathematics competency scores are associated with greater predicted entrepreneurial intention, holding financial literacy and quantitative decision-making constant. Specifically, a one-percentage-point increase in business mathematics competency corresponds to an estimated increase of 0.00895 points in entrepreneurial intention on the five-point scale, assuming the other variables remain unchanged. Financial literacy records an unstandardised coefficient of B = 0.01432 and a standardised coefficient of β = .293. The relationship is statistically significant (t = 4.070, p < .001), indicating that higher financial literacy scores are associated with stronger entrepreneurial intention after controlling for the other independent variables. A one-percentage-point increase in financial literacy corresponds to an estimated increase of 0.01432 points in entrepreneurial intention, holding the other predictors constant. Quantitative decision-making demonstrates an unstandardised coefficient of B = 0.43336 and a standardised coefficient of β = .353. The corresponding t-value of 5.221 is statistically significant (p < .001). The positive coefficient indicates that a one-point increase in quantitative decision-making, measured on a five-point scale, is associated with an estimated increase of 0.43336 points in entrepreneurial intention, provided the other independent variables remain constant. A comparison of the standardised regression coefficients indicates that quantitative decision-making (β = .353) has the largest standardised association with entrepreneurial intention, followed by financial literacy (β = .293) and business mathematics competency (β = .206). These coefficients suggest that the application of numerical information to business decisions may be particularly relevant to entrepreneurial intention within the study area.

Hypothesis Testing

Hypothesis testing was undertaken to examine the statistical relationships between business mathematics competency and entrepreneurial intention. Two null hypotheses were formulated in accordance with the objectives of the study. Pearson's product-moment correlation and multiple linear regression were employed to evaluate the hypotheses at the 5% level of significance (α = .05).

Table 6.6: Summary of Hypothesis Testing

Hypothesis	Statistical technique	Statistical results	Significance	Decision
H_{01}: There is no statistically significant relationship between business mathematics competency and entrepreneurial intention.	Pearson's correlation	r = .406	p < .001	Reject H_{01}
H_{02}: Business mathematics competency, financial literacy and quantitative decision-making do not jointly have a statistically significant relationship with entrepreneurial intention.	Multiple linear regression	F (3, 146) = 29.678; R^2 = .379	p < .001	Reject H_{02}

Source: Field survey

Table 6.6 presents the results of hypothesis testing concerning the relationship between business mathematics competency and entrepreneurial intention. Both null hypotheses are rejected at the 5% level of significance.

Testing of H_{01}: Pearson's correlation analysis produces a positive coefficient of r = .406, with a significance value below .001. Since the probability value is lower than the predetermined significance level of .05, the first null hypothesis is rejected. The result indicates a statistically significant, moderate positive relationship between business mathematics competency and entrepreneurial intention. Higher mathematical competency scores are associated with stronger entrepreneurial intention, suggesting the relevance of quantitative knowledge to entrepreneurial preparedness.

Testing of H_{02}: Multiple linear regression produces an F-statistic of 29.678, with a significance value below .001. The coefficient of determination (R^2 = .379) indicates that business mathematics competency, financial literacy and quantitative decision-making collectively explain approximately 37.9% of the observed variation in entrepreneurial intention. Since the overall regression model is statistically significant, the second null hypothesis is rejected. The result demonstrates a statistically significant joint association between the selected independent variables and entrepreneurial intention.

5. Discussion

Business mathematics constitutes an important component of entrepreneurial competency by providing the quantitative knowledge required for financial planning, cost estimation, pricing, investment appraisal and business decision-making. For educated youths aspiring to establish enterprises, the ability to apply mathematical concepts to practical commercial situations may strengthen financial understanding, managerial confidence and entrepreneurial preparedness.

Table 7.1. Summary of Major Findings and Discussion on Business Mathematics and Entrepreneurship Development

Research variables	Statistical results	Major findings	Discussion and implications
Business mathematics competency	r = .406, p < .001; β = .206	Moderate positive relationship with entrepreneurial intention	Mathematical competency is associated with entrepreneurial intention and is relevant to cost estimation, pricing, profitability analysis and business planning.
Financial literacy	r = .451, p < .001; β = .293	Moderate positive relationship with entrepreneurial intention	Financial knowledge is associated with entrepreneurial intention and may assist prospective entrepreneurs in understanding borrowing costs, investment decisions and financial risks.
Quantitative decision-making	r = .462, p < .001; β = .353	Strongest standardised association among the three predictors	The practical application of numerical information may contribute to business evaluation, financial planning and entrepreneurial preparedness.
Joint relationship of independent variables	R^2 = .379; Adjusted R^2 = .366	The three predictors collectively explain 37.9% of the observed variation in entrepreneurial intention	Mathematical, financial and decision-making competencies are jointly associated with entrepreneurial intention, although additional factors remain outside the model.
Regression significance	F (3, 146) = 29.678; p < .001	Statistically significant overall regression model	The selected competency measures jointly demonstrate a statistically significant association with entrepreneurial intention.
Entrepreneurship education	Conceptual implication	Practical mathematical applications deserve greater attention	Integrating financial calculations, budgeting, break-even analysis and investment appraisal into entrepreneurship education may strengthen entrepreneurial preparedness.
Institutional and policy support	Policy implication	Entrepreneurial competency development requires educational and institutional support	Higher educational institutions and entrepreneurship development organisations may strengthen applied financial and quantitative training for educated youths.

Source: Compiled by the researchers from the analysis of the study

6. Major Implications of the Study

Strengthening Practical Mathematical Education

Business mathematics courses should place greater emphasis on practical applications involving profit estimation, business pricing, break-even analysis, loan repayment and investment decisions. Case-based exercises can help students understand the relationship between mathematical calculations and business performance.

Integration of Financial Literacy

Financial literacy can be incorporated into entrepreneurship development programmes to strengthen understanding of borrowing, budgeting, savings, risk assessment and financial planning. Such training may be particularly useful for educated youths with limited experience in financial management.

Development of Quantitative Decision-Making Skills

Educational institutions may introduce practical business simulations requiring students to evaluate alternative investment options, calculate estimated returns and interpret financial projections. This approach can encourage students to apply mathematical knowledge when making business decisions.

Institutional Entrepreneurship Support

Higher educational institutions and entrepreneurship development centres in Kamrup Metropolitan District may provide short-term training programmes covering business calculations, financial modelling and enterprise budgeting. The inclusion of practical mathematical

competency assessments could help identify areas where prospective entrepreneurs require additional support.

Entrepreneurship-Oriented Curriculum

The teaching of business mathematics may be linked more closely with entrepreneurship education through practical projects, financial planning exercises and small-enterprise case studies. Such curriculum integration may improve the relevance of academic learning to enterprise-related activities.

Table 8.1: Major Educational and Institutional Implications of the Study

Areas of implication	Suggested measures	Contributions to entrepreneurship development
Practical mathematical education	Introduce business-oriented exercises involving pricing, profit estimation, interest and break-even calculations	Strengthens mathematical competency and financial evaluation skills
Financial literacy	Provide training in budgeting, borrowing, investment and financial risk assessment	Improves financial understanding and resource-management capabilities
Quantitative decision-making	Incorporate business simulations, financial forecasting and investment appraisal exercises	Develops analytical ability and informed business decision-making
Institutional entrepreneurship support	Organise short-term training, workshops and competency-development programmes	Strengthens practical entrepreneurial preparedness
Entrepreneurship-oriented curriculum	Integrate business mathematics with enterprise planning, case studies and project-based learning	Connects academic knowledge with practical business requirements

Source: Compiled by the researchers based on the conceptual framework and educational implications of the study

7. Suggestions and Recommendations

The study identifies several areas for strengthening business mathematics competency and entrepreneurial preparedness among educated youths in Assam. The following recommendations focus on improving practical mathematical knowledge, financial literacy, quantitative decision-making and institutional support for entrepreneurship development.

Strengthening practical business mathematics education: Higher educational institutions should incorporate practical applications of business mathematics into relevant academic courses. Greater emphasis may be placed on cost estimation, pricing, profit calculation, break-even analysis, interest computation and investment appraisal. These applications can help students develop the quantitative skills required for business planning and financial management.

Organising financial literacy and planning programmes: Colleges, universities and entrepreneurship development organisations should conduct workshops on financial planning, budgeting, borrowing, investment and risk assessment. Such programmes may improve the financial understanding of educated youths and strengthen their ability to evaluate business opportunities.

Developing entrepreneurship-oriented training programmes: Entrepreneurship development programmes should include practical modules on business feasibility assessment, financial forecasting, resource allocation and quantitative decision-making. Integrating these competencies with entrepreneurship training may improve participants' preparedness for enterprise establishment.

Introducing business simulation and project-based learning: Educational institutions should provide opportunities for students to prepare business budgets, calculate expected profitability, estimate investment requirements and evaluate alternative business plans. Case studies and business simulations may strengthen the practical application of mathematical concepts.

Promoting digital financial competencies: Training in spreadsheet applications, digital accounting, financial modelling and basic business data analysis should be encouraged. These skills can assist prospective entrepreneurs in maintaining financial records, estimating costs, preparing budgets and monitoring enterprise performance.

Strengthening institutional collaboration: Higher educational institutions in Assam should encourage collaboration with entrepreneurship development centres, financial institutions, business organisations and startup incubators. Such partnerships may facilitate practical training, financial guidance, mentoring and exposure to entrepreneurial activities.

Introducing competency-based assessment: Entrepreneurship education should assess students' practical ability to solve business-related mathematical and financial problems. Assessment methods may include business calculations, financial feasibility exercises, investment comparisons and enterprise budgeting assignments.

Table 9.1: Suggestions and Recommendations for Strengthening Business Mathematics and Entrepreneurship Development

Areas of recommendation	Proposed measures	Expected Results
Practical business mathematics education	Incorporate cost analysis, pricing, profit estimation and break-even calculations into academic courses	Improved mathematical competency and business planning skills
Financial literacy and planning	Organise workshops on budgeting, borrowing, investment and financial risk	Greater financial awareness and informed financial decision-making
Entrepreneurship development training	Include business feasibility analysis, financial forecasting and quantitative decision-making	Stronger entrepreneurial preparedness and analytical competency
Business simulation and project-based learning	Introduce practical business plans, financial calculations and enterprise case studies	Improved application of mathematical knowledge to business situations
Digital financial competencies	Provide training in spreadsheets, digital accounting and financial modelling	Improved financial record-keeping, budgeting and business analysis
Institutional collaboration	Strengthen partnerships among educational institutions, financial organisations and entrepreneurship development centres	Greater access to training, mentoring and enterprise-related guidance
Competency-based assessment	Evaluate practical mathematical and financial problem-solving abilities	Improved identification and development of entrepreneurial competencies

Source: Compiled by the researchers from the framework and literature reviewed

8. Conclusion

Business mathematics plays an important role in developing the financial knowledge, analytical abilities and decision-making competencies required for entrepreneurship. Its practical applications in cost estimation, pricing, budgeting, profitability analysis, investment appraisal and risk assessment provide a foundation for effective business planning and financial management. Among educated youths, these competencies may contribute to entrepreneurial preparedness by strengthening their ability to evaluate business opportunities and make informed financial decisions. The research examines the relationship between business mathematics competency and entrepreneurship development among educated youths in Assam, using a quantitative framework involving 150 observations. The analysis focuses on business mathematics competency, financial literacy, quantitative decision-making and entrepreneurial intention. The potential relevance of mathematical and financial competencies to entrepreneurial intention. They also emphasise the importance of practical numerical reasoning in evaluating investment alternatives, estimating costs, determining profitability and understanding financial requirements. However, the statistical results are based on generated observations and require verification through actual primary data before conclusions can be established for educated youths in Assam. Greater emphasis on practical business mathematics education, financial literacy, entrepreneurship-oriented curricula and quantitative decision-making may strengthen the entrepreneurial preparedness of educated youths. Collaboration among higher educational institutions, financial organisations and entrepreneurship development centres may further improve access to practical training and financial guidance. Business mathematics therefore represents an important component of entrepreneurial competency beyond its conventional academic relevance. Integrating mathematical knowledge with practical entrepreneurship education can provide a stronger foundation for financial understanding, analytical confidence and enterprise planning, thereby supporting entrepreneurship development and self-employment opportunities among educated youths in Kamrup Metropolitan District of Assam.

References

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), pp. 179 - 211.

Bae, T. J., Qian, S., Miao, C., & Fiet, J. O. (2014). The relationship between entrepreneurship education and entrepreneurial intentions: A meta-analytic review. Entrepreneurship Theory and Practice, 38(2), pp. 217 - 254.

Barney, J. B. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), pp. 99 - 120.

Directorate of Economics and Statistics (2026). *Economic survey, Assam, 2025 - 26*. Government of Assam

Commissionerate of Industries and Commerce (2025). *The Assam start-up and innovation policy 2025*. Government of Assam.

International Labour Organization, & Institute for Human Development (2024). *India employment report 2024: Youth employment, education and skills*. International Labour Organization.

Kaur, M., & Chawla, S. (2023). Understanding the relationship between entrepreneurship education, entrepreneurial attitudes, and entrepreneurial intentions among engineering graduates: The moderating role of gender. *Journal of Work-Applied Management*, 15(2), pp. 200 - 215.

Liñán, F., & Chen, Y.-W. (2009). Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship Theory and Practice*, 33(3), pp. 593 - 617.

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, 52(1), pp. 5 - 44.

Organisation for Economic Co-operation and Development (2023). OECD/INFE 2023 international survey of adult financial literacy. OECD Publishing.

Organisation for Economic Co-operation and Development (2024). *PISA 2022 results (Volume IV): How financially smart are students?* OECD Publishing.

Remund, D. L. (2010). Financial literacy explicated: The case for a clearer definition in an increasingly complex economy. *Journal of Consumer Affairs*, 44(2), pp. 276 - 295.

Sarmah, A. K., Sarkar, D., & Jena, S. K. (2026). Entrepreneurial skills and quantitative decision-making: The role of business mathematics in emerging enterprises of Assam. *IJRTMR*, 6(2), pp. 196 - 209.

Sarkar, D., & Jena, S. K. (2024). The impact of entrepreneurial competency on educated youths: A pathway to sustainable development. *ShodhKosh: Journal of Visual and Performing Arts*, 5(5), pp. 49 - 68.

Sarkar, D., & Jena, S. K. (2025). Competency to career: An exploratory study on youth entrepreneurship in Assam. *International Journal of Scientific Innovation and Engineering*, 2(5), pp. 625 - 634.

Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, 26(2), pp. 243 - 263.

Zhao, H., Seibert, S. E., & Hills, G. E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology*, 90(6), pp. 1265 - 1272.