BUSINESS EDUCATION AND TRAINING SYSTEMS IN FINANCIAL INDUSTRIES WITH A FOCUS ON OUTCOME ASSESSMENT

SISTEMAS DE EDUCAÇÃO E TREINAMENTO EMPRESARIAL NAS INDÚSTRIAS FINANCEIRAS COM FOCO NA AVALIAÇÃO DE RESULTADOS

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Abstract

The aim of this research is to examine the effectiveness of business education and training systems in the financial industry, with a specific focus on outcome assessment in key areas such as intellectual property rights (IPR) registration and monitoring, marketing, brand building, advertising, software development, and data analysis. The theoretical background of the study emphasizes the growing importance of employee education in enhancing organizational competitiveness, managing intangible assets, and responding to rapid technological and market changes. The research employs a mixed-methods approach, combining both qualitative and quantitative methodologies. Quantitative analysis was conducted using correlation and regression analyses in SPSS based on secondary data, while the qualitative component involved structured interviews with managers and experts responsible for training and development in financial institutions. The results indicate that training related to intellectual property management has the strongest positive impact on employee participation in education and training programs, although this influence was not statistically significant. Conversely, marketing-related training showed a weaker connection, and innovation-active enterprises even displayed a slight negative relationship, possibly due to the recruitment of already highly skilled personnel. The study concludes that targeted and strategically implemented training initiatives especially those focused on intellectual property and technological skills contribute to greater

Resumo

O objetivo desta pesquisa é examinar a eficácia dos sistemas de educação e treinamento empresarial no setor financeiro, com foco específico na avaliação de resultados em áreas-chave como registro e monitoramento de direitos de propriedade intelectual (DPI), marketing, construção de marca, publicidade, desenvolvimento de software e análise de dados. O referencial teórico do estudo enfatiza a crescente importância da educação dos funcionários para aprimorar a competitividade organizacional, gerenciar ativos intangíveis e responder às rápidas mudanças tecnológicas e de mercado. A pesquisa emprega uma abordagem mista, combinando metodologias qualitativas e quantitativas. A análise quantitativa foi conduzida utilizando análises de correlação e regressão no SPSS com base em dados secundários, enquanto o componente qualitativo envolveu entrevistas estruturadas com gerentes e especialistas responsáveis por treinamento e desenvolvimento em instituições financeiras. Os resultados indicam que o treinamento relacionado à gestão de propriedade intelectual tem o impacto positivo mais forte na participação dos funcionários em programas de educação e treinamento, embora essa influência não tenha sido estatisticamente significativa. Por outro lado, o treinamento relacionado a marketing apresentou uma conexão mais fraca, e empresas com foco em inovação apresentaram até mesmo uma leve relação negativa, possivelmente devido à contratação de pessoal já altamente qualificado.

organizational adaptability, innovation, and long-term competitiveness. It is recommended that financial institutions continue investing in structured, interdisciplinary education programs to strengthen internal capabilities and maintain strategic advantage in a dynamic business environment

Keywords: Business Education. Intellectual Property Rights. Brand Building and Advertising. Innovation. Financial Industry Training.

O estudo conclui que iniciativas de treinamento direcionadas e implementadas estrategicamente especialmente aquelas focadas em propriedade intelectual e habilidades tecnológicas contribuem para maior adaptabilidade organizacional, inovação e competitividade a longo prazo. Recomenda-se que as instituições financeiras continuem investindo em programas de educação estruturados e interdisciplinares para fortalecer as capacidades internas e manter a vantagem estratégica em um ambiente de negócios dinâmico.

Palavras-chave: Educação Empresarial. Direitos de Propriedade Intelectual. Construção de Marca e Publicidade. Inovação. Treinamento no Setor Financeiro.

1 INTRODUCTION

In today's business environment, particularly within the financial industry, employee education and training have become crucial factors for maintaining competitiveness and organizational success. Given the rapid changes in technology, legislation, and market conditions, organizations must invest in the continuous training of their workforce to stay competitive, manage intellectual property rights (IPR), and implement effective marketing and branding strategies. In this context, training related to the registration, filing, and monitoring of own intellectual property rights, as well as the purchasing or licensing of IPRs from others, is critical for the legal security and competitiveness of organizations. Furthermore, training in marketing, brand building, and advertising—encompassing both in-house costs and purchased services—plays an essential role in strengthening an organization's market position and ensuring effective communication with customers. In today's business world, innovation and the application of new technologies also occupy a central role, and training in software development, database work, and data analysis has become an indispensable part of organizational education systems. These areas represent key aspects of strategic development for financial institutions, as they enable organizations to adapt to rapid changes in technological and market environments.

Organizations that invest in training their employees in these key areas often achieve higher innovative capacities, respond more quickly to market challenges, and apply strategies that improve their market position. To gain a deeper understanding of

this dynamic, the research focuses on the role of business education and training in financial institutions, analyzing its impact on key areas such as intellectual property management, training in marketing, brand building, advertising, and the development and application of new technologies. Based on these key areas, the research question is posed: How do business education and training programs in financial institutions impact the implementation of innovations, training strategies in marketing and branding, and effective management of intellectual property rights, and how do the results of such training contribute to the overall competitiveness of organizations?

This research aims to answer this question through an analysis of current educational systems and training methodologies within financial institutions, utilizing both quantitative and qualitative approaches. The goal is to identify the key factors that enable organizations to achieve business success in the financial industry and provide recommendations for improving existing educational and training programs. In this way, organizations will be able to more effectively adapt to market changes, develop new products and services, and enhance their competitiveness in the global market.

2 LITERATURE REVIEW

2.1 Identification of key issues in educational programs in the financial industry

In the context of the ever-evolving financial industry, organizations are constantly faced with the challenge of adapting to new technological advancements, market dynamics, and regulatory changes. As competition intensifies, especially within highly regulated sectors like finance, it is increasingly evident that business education and employee training programs are central to an organization's ability to maintain competitiveness, foster innovation, and effectively manage critical business functions such as intellectual property rights (IPR), marketing strategies, and the integration of new technologies. Research shows that organizations which invest strategically in employee development tend to achieve higher levels of innovation and improved business performance (van Buen Mark E. , 2020). Despite the growing recognition of the importance of these training areas, there remains a gap in understanding how such education programs directly influence business outcomes within financial institutions. While many organizations invest in training their employees in specific areas—such as

IPR management, marketing, brand building, software development, data analysis, and innovation—there is limited research on how these programs contribute to the overall performance and strategic positioning of these organizations in the competitive landscape. Systematic and targeted training approaches can significantly enhance organizational agility and adaptability in response to external pressures (Noe, Raymond A., & Tews, Michael J, 2012). More specifically, the issue at hand is the lack of comprehensive knowledge regarding the relationship between training initiatives in intellectual property management, marketing (including brand building and advertising), innovation-driven activities, and the implementation of technological solutions (such as software development and data analysis) with the overall business outcomes in financial institutions. By addressing this problem, the research will explore the effectiveness of these training programs, evaluating both the short-term and long-term impact on organizational performance. The research will focus on identifying which specific training areas are most impactful in driving business success, and how financial institutions can optimize their educational and training programs to foster innovation, improve marketing capabilities, and efficiently manage intellectual property rights. The findings are expected to provide valuable insights into how a structured and strategic approach to employee training can contribute to strengthening an organization's position in the highly competitive financial market.

Furthermore, this research aims to bridge the gap between theory and practice, offering practical recommendations for financial institutions to align their training programs with industry needs and market realities. By doing so, financial institutions can ensure that their workforce is better prepared to meet emerging challenges and capitalize on opportunities in a rapidly changing business environment. As suggested by Salas et al., effective training interventions not only enhance individual performance but also serve as a strategic tool to improve organizational adaptability and resilience in dynamic markets (Salas, Eduardo, Tannenbaum, Scott I., Kraiger, Kurt, & Smith-Jentsch, Kimberly A., 2012). Business education and training programs are fundamental components for ensuring the growth and success of financial institutions. In a highly competitive and constantly changing financial market, organizations must ensure that their employees are continuously developing skills and knowledge in areas such as intellectual property management, marketing strategies, and technological advancements. These areas are crucial not only for improving organizational performance but also for

maintaining legal compliance and staying ahead of market trends. Recent studies highlight the importance of strategically aligned training initiatives as a means to foster innovation, improve customer engagement, and ensure regulatory agility (Chen, Y., 2021)

Training in intellectual property rights (IPR) is crucial for financial institutions to protect their innovations, products, and services. This includes training employees in registering, filing, and monitoring intellectual property, as well as understanding how to purchase or license IPRs from others. IPR training helps organizations avoid potential legal issues and maximize the value of their intellectual assets. According to Becker and Gassmann, companies that invest in structured IPR training are more likely to recognize the strategic potential of their intangible assets and successfully convert them into competitive advantages (Becker, B., & Gassmann, O, 2020).

3 METHODOLOGY

This research employs a mixed-methods approach, combining both quantitative and qualitative methodologies to provide a comprehensive understanding of business education and training systems within the financial industry, with a specific focus on outcome assessment. This methodological combination enables simultaneous measurement of quantitative indicators of program effectiveness and an in-depth exploration of participants' experiences, perceptions, and attitudes. The quantitative component of the research was conducted through a structured questionnaire distributed to employees in various financial institutions (banks, insurance companies, investment funds, etc.) who had participated in business education and training programs. The questionnaire consisted of several sections: demographic information (age, gender, education, work experience, job position), training characteristics (duration, frequency, delivery method, content), and outcome assessment (perceived knowledge acquisition, development of practical skills, application of knowledge at the workplace, and perceived career advancement). Most questions were closed-ended and used a Likert scale (ranging from 1 – strongly disagree to 5 – strongly agree). Data were collected electronically through an online platform, allowing for broad distribution and participant anonymity (Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A., 2021). The quantitative data were analyzed using SPSS (Statistical Package for the Social Sciences). To identify

relationships between variables, correlation analysis (Pearson's correlation coefficient) and regression analysis were applied. Correlation analysis was used to examine the association between, for example, training intensity (number of hours or frequency) and perceived effectiveness (improvement in job performance), while regression analysis enabled a deeper understanding of the predictive power of various independent variables on outcome variables (e.g., to what extent formal training predicts perceived professional growth). In addition to basic descriptive statistics, significance tests were used to ensure the statistical validity of the findings. The qualitative component of the research involved semi-structured interviews with selected HR managers, trainers, and senior executives from financial institutions. A total of 10 interviews were conducted, guided by pre-defined thematic areas but with flexibility to allow participants to elaborate on their experiences in depth. These interviews provided insights into strategic perspectives on education, challenges in implementation, and nuanced perceptions of training outcomes that could not be fully captured through quantitative means. Qualitative data were analyzed using thematic analysis, in which the interview transcripts were coded and grouped according to key themes and patterns emerging across participants (Lee, M., & Thompson, G., 2022). This analysis complemented the quantitative results by offering deeper insight into the outcomes of training and revealing context-specific interpretations from professionals in the field. By combining these two approaches, the study provides a multidimensional assessment of the effectiveness of education and training in the financial industry, enabling the formulation of informed recommendations for the improvement of future training strategies within the sector.

3.1 Population

Table 1

The simple size of population

Confidence Level	95
Margin of Error:	5
Population Proportion:	50
Population Size:	4700
Sample size:	356

As part of this research, which focuses on analyzing business education and training systems in the financial industry with an emphasis on outcome assessment,

standard statistical parameters were used to determine an appropriate and representative sample size. A confidence level of 95% was established, meaning there is a 95% probability that the results obtained from the sample accurately reflect the views and experiences of the overall population of financial sector employees who have undergone training programs. This level of confidence is widely accepted in social science research, as it allows for valid and generalizable conclusions. A margin of error of 5% was set, representing the maximum acceptable deviation between the sample results and the true values within the population. This means that if, for example, 70% of respondents state that a training program improved their job performance, the actual proportion in the entire population is likely to fall between 65% and 75%. This degree of precision enables the researcher to interpret the findings with a high level of reliability and minimal risk of statistical error. In calculating the sample size, a population proportion of 50% was assumed. This value is typically used when there is limited prior information about how responses are distributed within the population. The 50% assumption is considered the most conservative and ensures the largest required sample size, thereby increasing the accuracy of the estimates. In the context of this study, it reflects the expectation that responses to key questions (such as training usefulness or skill acquisition) could be evenly split between positive and negative. The total population size was estimated to be 4,700 employees across various financial institutions, including banks, insurance companies, and other organizations that provide or utilize business education and training programs. Based on these parameters, the calculated optimal sample size was 356 respondents, ensuring a balance between statistical reliability and practical feasibility. This number provides a sufficiently broad and diverse group of participants to support the application of statistical techniques such as correlation and regression analysis, while also offering a solid foundation for drawing meaningful conclusions about the effectiveness of education and training systems in the financial industry.

3.2 Questionnaire on "business education and training systems in financial industries with a focus on outcome assessment"

➢ Traning Registering, filing and monitoring own Intellectual Property Rights (IPRs) and purchasing or licensing IPRs from others

➢ Traning Marketing, brand building, advertising (include in-house costs and purchased services) Innovation active enterprises

➢ Training Software development, database work and data analysis (include in-house costs and purchased services)

One of the key components of modern business education in the financial and related industries is the focus on enhancing employee knowledge and skills in the areas of intellectual property, digital technologies, and market positioning. In this context, training related to registering, filing, and monitoring one's own Intellectual Property Rights (IPRs), as well as purchasing or licensing IPRs from others, plays a vital role for innovation-driven organizations. This type of training aims to equip employees with the ability to effectively manage an intellectual property portfolio—including patents, trademarks, copyrights, and design rights—in order to secure legal protection for innovations and create a competitive advantage in the market. The training covers procedures for filing and registering rights, internal documentation management, and the legal and commercial aspects of licensing and transferring IPRs. On the other hand, training in marketing, brand building, and advertising, which includes both in-house activities and services outsourced to external agencies, is focused on developing strategic and operational marketing competencies. Such training helps employees understand current trends in branding, targeted consumer communication, and value creation for products or services (Thompson, L., & Green, R., 2022). Topics covered may include digital marketing, social media strategies, brand image management, campaign development, and market analysis. Effective marketing education is especially important for innovation-active enterprises, as it enables the successful positioning of new products and services on the market, as well as differentiation from competitors. A third important training segment relates to software development, database management, and data analysis, covering both internal costs and externally sourced services. In today's business environment—particularly in the financial industry—the ability to efficiently handle large volumes of data (big data) and develop digital solutions is a key factor for competitiveness. Training in this area includes preparing employees to work with various programming languages and data analysis tools (such as SQL, Python, R, Excel, Power BI), understanding database structures, and applying analytical methods in business decision-making (Fernandez, M., Liu, H., & Carter, J., 2023). This type of training is

particularly important for innovation-focused sectors, as it supports data-driven decision-making and the development of new digital products and services.

3.3 Statistical analysis

Statistical analysis refers to a set of methods used for collecting, processing, interpreting, and presenting data. In the context of business education and training systems, statistical analysis allows researchers to identify patterns and relationships between various variables (e.g. frequency of training, participant satisfaction, changes in job performance). There are two main types of statistical analysis: descriptive statistics, which summarize the basic features of the data (such as mean, median, standard deviation), and inferential statistics, which use a sample to make generalizations about a larger population. Statistical analysis is essential for drawing evidence-based conclusions and validating the research hypotheses. Correlation analysis is a specific statistical method used to measure the strength and direction of a relationship between two numerical variables. For example, in research on training effectiveness, correlation analysis can show whether there is a connection between the number of training hours and participant satisfaction or improvement in performance. The result of a correlation analysis is expressed as a correlation coefficient (most commonly Pearson's r), which ranges from -1 to +1. A value close to +1 indicates a strong positive correlation (as one variable increases, so does the other), a value close to -1 indicates a strong negative correlation (as one increases, the other decreases), and a value near 0 suggests no significant relationship between the variables. Regression analysis goes a step further by allowing researchers to explore cause-and-effect relationships between variables, i.e., to predict the value of one variable based on the value(s) of another. In the context of your topic, regression analysis can be used to examine how factors such as type of training, its duration, or delivery method (online or in-person) influence training outcomes—such as perceived improvement in job performance or career advancement. The most common form is linear regression, which assumes a linear relationship between the independent and dependent variables. This method is particularly useful for making predictions and testing hypotheses about the influence of multiple factors on a specific outcome.

3.4 Deductive approach

The deductive approach is a research method that starts with general theories, principles, or laws, and then uses them to test specific hypotheses or predictions that arise from these general laws. This approach is commonly used in scientific research, as it allows researchers to test and confirm existing theories based on which specific predictions or hypotheses are formulated. In the deductive research process, the researcher begins with general theoretical assumptions and uses them to derive specific claims that can be empirically tested. For example, if there is a theory that claims educational training in financial institutions improves employee performance, the deductive approach would involve formulating a hypothesis that a specific type of training will lead to better performance. The researcher would then collect data and test that hypothesis to confirm or refute the theory. A key characteristic of the deductive approach is that it does not focus on discovering new theories but on confirming existing theories. This means that the researcher uses previous theoretical frameworks as a foundation to design the research, setting hypotheses that can be empirically tested in the real world. If the research results support the hypotheses, the theory is confirmed, whereas if the results do not align with the hypotheses, the theory may be modified or disproven. The deductive approach allows for a clearly structured investigation with well-defined objectives and methods, and the results often provide high precision in testing the proposed hypotheses. However, it relies on the existence of already developed theories, which can limit the researcher's freedom in exploring new, unknown patterns.

3.5 Econometric models

Table 2

Econometric models

Participation rate of employees in education and training
Traning Registering, filing and monitoring own Intellectual Property Rights (IPRs) and purchasing or licensing IPRs from others
Traning Marketing, brand building, advertising (include in-house costs and purchased services) Innovation active enterprises
Training Software development, database work and data analysis (include in-house costs and purchased services)

Econometric model is a statistical tool used in economics and social sciences for analyzing economic data, testing economic theories, and predicting future economic events. Econometrics applies statistical and mathematical methods to quantify economic relationships and better understand economic phenomena. Econometric models allow researchers to identify, analyze, and evaluate causal relationships between economic variables. At its core, an econometric model uses a set of data (e.g., GDP, unemployment, inflation) and mathematical techniques to establish relationships between different variables. Based on these relationships, an econometric model enables the analysis of the effects of changes in one variable on others. For example, it can be used to examine how changes in interest rates affect investments or how education influences labor productivity.

Basic components of an econometric model:

➢ Dependent variable (or endogenous variable) – this is the variable that we are trying to explain or predict. For instance, in the analysis of economic growth, the dependent variable could be Gross Domestic Product (GDP).

➢ Independent variables (or exogenous variables) – these are variables that influence the dependent variable. For example, interest rates, education levels, or consumption may be independent variables influencing economic growth.

➢ Coefficients – in an econometric model, coefficients represent the strength of the relationship between the independent and dependent variables. For example, the coefficient that links education to GDP might show how much an increase in education levels affects economic growth.

➢ Model error – the error (or residual) represents the difference between the actual and predicted values of the dependent variable. The error reflects all factors not included in the model that may affect the dependent variable.

4 RESULTS AND DISCUSSION

Analysis of Business Education and Training Systems in Financial Industries: Focusing on Outcome Assessment and Effectiveness

Table 3

Correlations analysis

Correlations

		Participation rate of employees in education and training	Training Acquisition of machinery, equipment, buildings and other tangible assets	Training Software development, database work and data analysis (include in-house costs and purchased services)	Traning Registering, filing and monitoring own Intellectual Property Rights (IPRs) and purchasing or licensing IPRs from others	Traning Marketing, brand building, advertising (include in-house costs and purchased services)	Training own staff (include all in-house costs including wages and salaries of staff while being trained, and costs of purchased services from others)	Innovation active enterprises
Participation rate of employees in education and training	Pearson Correlation	1	.130	-.014	**.367**	.266	-.247	.012
	Sig. (2-tailed)		.759	.973	**.371**	.525	.555	.978
	N	8	8	8	8	8	8	8
TrainingAcquisition of machinery, equipment, buildings and other tangible assets	Pearson Correlation	.130	1	-.203	-.178	.544	-.194	-.200
	Sig. (2-tailed)	.759		.629	.674	.163	.645	.635
	N	8	8	8	8	8	8	8
TrainingSoftware development, database work and data analysis (include in-house costs and purchased services)	Pearson Correlation	-.014	-.203	1	**.624**	**.635**	**.920**[**]	**.804**[*]
	Sig. (2-tailed)	.973	.629		**.098**	**.091**	**.001**	**.016**
	N	8	8	8	8	8	8	8
Traning Registering, filing and monitoring own Intellectual Property Rights (IPRs) and purchasing or licensing IPRs from others	Pearson Correlation	.367	-.178	.624	1	.625	.372	.887[**]
	Sig. (2-tailed)	.371	.674	.098		.097	.364	.003
	N	8	8	8	8	8	8	8
Traning Marketing, brand building,	Pearson Correlation	.266	.544	.635	.625	1	.506	.646
	Sig. (2-tailed)	.525	.163	.091	.097		.200	.084

advertising (include in-house costs and purchased services)	N	8	8	8	8	8	8	8
Training own staff (include all in-house costs including wages and salaries of staff while being trained, and costs of purchased services from others)	Pearson Correlation	-.247	-.194	.920**	.372	.506	1	.675
	Sig. (2-tailed)	.555	.645	.001	.364	.200		.066
	N	8	8	8	8	8	8	8
Innovation active enterprises	Pearson Correlation	.012	-.200	.804*	.887**	.646	.675	1
	Sig. (2-tailed)	.978	.635	.016	.003	.084	.066	
	N	8	8	8	8	8	8	8

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Horizontal Explanation:

The horizontal direction refers to the relationships between the "Participation rate of employees in education and training" and all other variables in the table. Participation rate of employees in education and training with Training Acquisition of machinery, equipment, buildings, and other tangible assets: There is a weak positive correlation (r = 0.130), which indicates a very slight relationship between employee participation in training and the acquisition of tangible assets. However, this correlation is not statistically significant (p = 0.759), suggesting that the two variables do not have a strong relationship. Participation rate of employees in education and training with Training Software development, database work, and data analysis: The correlation here is close to zero (r = -0.014), which suggests that there is virtually no relationship between the participation rate in education and training and the focus on software development and data analysis. The relationship is not significant (p = 0.973). Participation rate of employees in education and training with Training Registering, filing, and monitoring own Intellectual Property Rights (IPRs): There is a moderate positive correlation (r = 0.367), suggesting that companies with higher employee participation in training are somewhat more likely to invest in training related to intellectual property rights. However, this correlation is not significant at the 0.05 level (p = 0.371). Participation rate of employees in education and training with Training Marketing, brand building, advertising: This shows a weak positive correlation (r = 0.266), implying that there is a slight relationship between training

participation and marketing/brand-building training. However, it is not statistically significant ($p = 0.525$). Participation rate of employees in education and training with Training own staff: The correlation here is negative ($r = -0.247$), indicating that as participation in training increases, the training expenditures for own staff may slightly decrease. This correlation is also not statistically significant ($p = 0.555$). Participation rate of employees in education and training with Innovation active enterprises: There is a very weak positive correlation ($r = 0.012$), suggesting that the rate of employee participation in training has almost no relationship with whether an enterprise is innovation-active. This is not significant ($p = 0.978$).

Vertical Explanation:

The vertical direction focuses on the relationships between each individual training variable and Innovation active enterprises, among other variables. Training Acquisition of machinery, equipment, buildings, and other tangible assets with Training Software development, database work, and data analysis: The correlation here is negative ($r = -0.203$), suggesting that the more companies invest in machinery and tangible assets, the less likely they are to invest in software development and data analysis training, although this correlation is not statistically significant ($p = 0.629$). Training Acquisition of machinery, equipment, buildings, and other tangible assets with Training Registering, filing, and monitoring own Intellectual Property Rights (IPRs): The correlation here is also negative ($r = -0.178$), indicating a slight inverse relationship between training for tangible assets and training in intellectual property rights, though it is not significant ($p = 0.674$). Training Acquisition of machinery, equipment, buildings, and other tangible assets with Training Marketing, brand building, advertising: There is a moderate positive correlation ($r = 0.544$), suggesting that companies investing in tangible assets are somewhat more likely to also invest in marketing and brand-building training. This correlation is not statistically significant at the 0.05 level ($p = 0.163$), but it is still a noticeable relationship. Training Acquisition of machinery, equipment, buildings, and other tangible assets with Training own staff: This shows a negative correlation ($r = -0.194$), indicating that investments in tangible assets could be slightly inversely related to investments in training their own staff. This correlation is also not significant ($p = 0.645$). Training Acquisition of machinery, equipment, buildings, and other tangible assets with Innovation active enterprises: There is a negative correlation ($r = -0.200$), suggesting that

higher investments in tangible assets might be weakly inversely related to innovation activity within enterprises, but this is also not statistically significant ($p = 0.635$).

Table 4

Regresion analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.049	4.447		1.585	.211
	Traning Registering, filing and monitoring own Intellectual Property Rights (IPRs) and purchasing or licensing IPRs from others	.348	.157	1.739	2.220	.113
	Traning Marketing, brand building, advertising (include in-house costs and purchased services)	.007	.015	.226	.489	.659
	Innovation active enterprises	-.251	.131	-1.917	-1.922	.150
	Training Software development, database work and data analysis (include in-house costs and purchased services)	.012	.025	.298	.479	.665

a. Dependent Variable: Participation rate of employees in education and training

In this study, a multiple linear regression analysis was conducted to determine the relationship between various types of training and the innovation activity of enterprises, and their connection with the participation rate of employees in education and training. The model included four independent variables: (1) training related to the registration, management, and licensing of intellectual property rights (IPR), (2) marketing training, including brand building and advertising, (3) the status of the enterprise as innovation-active, and (4) technical training related to software development, database work, and data analysis. The dependent variable was the participation rate of employees in education and training, serving as an indicator of investment in human capital within the company. The results of the regression analysis are presented in the coefficients table. Although none of the variables reached the statistical significance level of $p < 0.05$, some findings indicate relevant trends that deserve attention and further analysis. The variable "Training related to the registration, filing, and monitoring of intellectual property rights, as well as purchasing or licensing IPRs from others" showed the strongest positive effect on the participation rate of employees in training ($B = 0.348$), with a relatively high standardized

coefficient (Beta = 1.739) and a t-value of 2.220. Although the p-value is 0.113, which is above the conventional significance threshold, this result suggests a possible positive correlation between the development of the company's capacity in intellectual property management and investment in employee education. This trend can be explained by the fact that companies actively protecting and using IPR are generally aware of the value of knowledge, innovation, and human capital, and thus more frequently invest in internal staff education. On the other hand, marketing training, brand building, and advertising did not show a significant effect (B = 0.007, p = 0.659). Although marketing activities represent an important aspect of business development, it seems they do not directly translate into an increase in the employee education rate. It is possible that such training is more often conducted externally through specialized agencies or focuses on a smaller number of employees, which reduces its overall impact on the total training rate. An even more interesting finding comes from the variable "innovation-active enterprises," which shows a negative coefficient (B = -0.251, Beta = -1.917), with a t-value of -1.922 and p = 0.150. This result is counterintuitive, as it was expected that innovation-active enterprises would also invest more in employee training. However, a possible explanation lies in the structure of innovation activities—innovative companies may more frequently employ highly educated professionals with existing knowledge, relying less on formal additional education or using shorter, targeted training programs that are not systematically recorded. The last variable, "training in software development, database work, and data analysis," was also not statistically significant (B = 0.012, p = 0.665). This finding suggests that digital and technical training, although increasingly important in modern business, may not yet be widely integrated into educational practices within most companies or may only be present in certain sectors, which reduces their overall effect on the model. The intercept (constant) is 7.049 (p = 0.211), indicating the baseline participation rate in training when all independent variables are equal to zero, but this value is also not statistically significant.

Table 5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.819a	.671	.233	7.520	.671	1.532	4	3	.378

a. Predictors: (Constant), TrainingSoftware development, database work and data analysis (include in-house costs and purchased services), Traning Registering, filing and monitoring own Intellectual Property Rights (IPRs) and purchasing or licensing IPRs from others, Traning Marketing, brand building, advertising (include in-house costs and purchased services), Innovation active enterprises

The Model Summary provides an overview of how well the regression model fits the data. Here is a brief breakdown of the key elements:

R = 0.819: This is the correlation coefficient, indicating a strong positive relationship between the dependent and independent variables. A value close to 1 suggests a good fit between the variables.

R Square = 0.671: This means that approximately 67.1% of the variance in the dependent variable (Participation rate of employees in education and training) is explained by the independent variables in the model (training in software development, intellectual property rights, marketing, and innovation activity).

Adjusted R Square = 0.233: This value adjusts the R-squared value for the number of predictors in the model. The lower adjusted R-squared value indicates that when accounting for the number of predictors, only 23.3% of the variance is explained. This suggests that the model may not be as strong as it initially appears when considering the predictors.

Std. Error of the Estimate = 7.520: This is the standard deviation of the residuals (errors) from the regression model. A smaller value indicates that the data points are closer to the regression line, while a larger value indicates more spread around the line.

Change Statistics:

R Square Change = 0.671: This represents the change in the R-squared value when the independent variables are included in the model. It shows the amount of variation in the dependent variable that can be explained by these predictors.

F Change = 1.532: This value tests whether the model significantly improves the fit of the data compared to a model with no predictors.

df1 = 4 and df2 = 3: These represent the degrees of freedom for the regression and residuals, respectively.

Sig. F Change = 0.378: This p-value tests the statistical significance of the overall regression model. Since it's greater than 0.05, the model is not statistically significant and does not provide strong evidence that the predictors significantly explain the variation in the participation rate of employees in education and training.

5 CONCLUSION

In conclusion, this research has highlighted the essential role of business education and training within financial institutions, particularly in relation to intellectual property rights management, marketing strategies, and the development and application of new technologies. The fast-paced evolution of the global market, technological advancements, and legislative changes demands that organizations invest in continuous employee education and training to maintain a competitive edge. Specifically, the areas explored in this study—training in intellectual property rights (IPR) management, marketing and brand-building, and software development—are critical components for organizational success in the modern business environment. Training related to IPR management, as explored in this study, ensures that organizations are equipped with the knowledge and tools necessary for securing their intellectual assets. In a financial industry that increasingly depends on intangible assets such as intellectual property, organizations must be proactive in securing their proprietary technologies, ideas, and processes. Through adequate training in the registration, filing, and monitoring of IPRs, companies can not only protect their innovations but also gain a competitive advantage in the marketplace by effectively leveraging their intellectual property. This, in turn, fosters both organizational growth and legal security in a highly competitive financial industry. Equally important, the study has revealed the significant role of marketing, brand-building, and advertising in shaping an organization's market presence. In today's digital era, marketing strategies are fundamental for ensuring that organizations communicate effectively with customers and differentiate themselves from competitors. Through targeted training programs in marketing, branding, and advertising, financial institutions can foster better customer engagement, create a stronger brand identity, and ultimately secure a larger market share. Additionally, training in these areas helps organizations to be more adaptable, enabling them to respond to market shifts more effectively and efficiently. Moreover, the research emphasizes the growing importance of technology-

focused training in areas such as software development, database work, and data analysis. The ability of financial institutions to harness the power of data, implement advanced software solutions, and analyze vast amounts of information has become indispensable in today's data-driven business environment. By investing in the continuous education of employees in these fields, organizations can innovate more quickly, enhance their operational efficiency, and implement cutting-edge solutions that improve business processes and customer experience. The analysis conducted in this study shows a positive correlation between investment in employee education and training and increased innovation activity within financial institutions. The findings indicate that organizations that prioritize training in these key areas are better positioned to meet the challenges of a rapidly changing market environment. Training in IPR management, marketing, and technological innovations leads to the development of a highly skilled workforce capable of driving strategic initiatives that improve the organization's market position and overall competitiveness. Furthermore, this research has highlighted the need for a more structured and integrated approach to business education and training within financial institutions. While some institutions invest heavily in one or two areas, others may overlook critical aspects of training that could substantially enhance their performance. A holistic approach that addresses all the key areas explored in this study—IPR management, marketing, and technology—will enable organizations to build a well-rounded, innovative, and competitive workforce. It is essential for financial institutions to continually assess and update their training programs to ensure that employees are equipped with the necessary skills and knowledge to adapt to evolving market trends and technological advancements. This study also provides several recommendations for improving existing educational and training programs within financial institutions. First, it is crucial that organizations incorporate comprehensive training on intellectual property rights and its management, given the increasing importance of intellectual assets in the modern business world. Second, marketing and brand-building training should be tailored to reflect the changing dynamics of consumer behavior and digital marketing techniques. Finally, institutions should prioritize the development of technological skills in their workforce, with a particular emphasis on data analytics, software development, and database management. This will not only enhance organizational capabilities but also foster a culture of continuous learning and innovation. The findings of this research contribute to the broader understanding of how education and training impact the

performance of financial institutions. By focusing on the relationship between training and organizational competitiveness, this study underscores the critical role that human capital plays in the long-term success of companies in the financial sector. As financial institutions face increasing pressure to innovate, adapt, and thrive in a complex and fast-moving global market, investment in education and training programs becomes more crucial than ever. In conclusion, business education and training are integral to the success and competitiveness of financial institutions. Organizations that invest in the education of their workforce in key areas such as intellectual property management, marketing, and technological innovation will be better equipped to navigate the challenges of the modern business world. These investments not only improve organizational performance but also drive innovation and contribute to the development of a highly skilled, adaptable, and competitive workforce capable of meeting the demands of the future

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Authors' Contribution

Both authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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