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Artificial Intelligence Integration in Business Management Education: Organizational Capability Development and Customer-Centric Skills among University Students in Lima, Peru

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Abstract*– This study examines the integration of artificial intelligence (AI) into business management education and its influence on the development of organizational capabilities and customer-centric skills among university students in Lima, Peru. A quantitative correlational–explanatory approach was employed using a non-experimental, cross-sectional design and covariance-based structural equation modeling (CB-SEM) to evaluate the proposed conceptual model. The sample consisted of 385 undergraduate students enrolled in business management–related academic programs. The findings indicate statistically significant relationships between AI training and organizational capability development ($\beta = 0.61$; $p < 0.001$), as well as between organizational capabilities and customer-centric skills ($\beta = 0.55$; $p < 0.01$). Additionally, a direct effect of AI training on customer-oriented competencies was identified ($\beta = 0.48$; $p < 0.05$), highlighting the educational value of intelligent technologies in business contexts. Despite these positive outcomes, barriers such as limited practical exposure to AI tools, technological infrastructure constraints, and insufficient curricular integration were identified. The study proposes academic and institutional strategies to strengthen AI integration within business management curricula. Overall, AI emerges as a strategic component for developing organizational understanding and customer-focused competencies aligned with digital business transformation.

Keywords: Artificial Intelligence; Business Management Education; Organizational Capabilities; Customer-Centric Skills; Higher Education.

I. INTRODUCTION

In the contemporary context, marked by the rapid expansion of artificial intelligence (AI), the digitization of markets, and the growing complexity of organizational environments, higher education institutions face the challenge of training professionals capable of operating in highly dynamic and uncertain business environments [1]-[2]. These transformations are taking place in a context characterized by competitive pressures, technological gaps, ethical demands, and profound changes in the relationship between organizations and their customers [3]. Against this backdrop, university education in business management plays a strategic role in preparing students not only for technical skills but also for analytical, organizational, and customer-oriented capabilities [4]-[5].

Business management training programs must respond to the need to integrate emerging technologies that are redefining decision-making processes, knowledge management, and user interaction [6]. In this context, artificial intelligence has established itself as a key tool for optimizing organizational processes, analyzing large volumes of data, and customizing products and services according to customer expectations [7]-[8]. However, its incorporation into university education requires an approach that combines technological learning with an understanding of its organizational and social implications.

AI applied to business management transcends its instrumental dimension and is directly linked to the transformation of organizational structures and company-customer relationship models [9]. From an educational perspective, its integration enables students to develop skills in data-based decision-making, strategic planning, and customer orientation in highly digitized environments [10]-[11]. It also fosters a critical view of the impacts of automation, ethics in the use of information, and responsibility in the management of intelligent technologies [12]-[13].

In higher education, the incorporation of artificial intelligence into business management programs has gradually shifted from a focus on isolated tools to a more comprehensive view that treats AI as a cross-cutting component of the educational process [14]. This approach allows students to understand how intelligent technologies influence organizational culture, strategic decision-making, and customer experience. In this way, university education contributes to the development of professionals with a systemic understanding of business management in digital contexts [15]-[16].

In the case of Metropolitan Lima, a city characterized by marked business diversity, sustained growth in the service sector, and uneven adoption of digital technologies, private universities play a fundamental role in training future managers and organizational leaders [17]. The interaction among companies, customers, and smart technologies poses specific challenges in this context, where highly digitized organizations coexist with others that face structural and training limitations to adopting AI [18]-[19]. Therefore, it is relevant to analyze how business management students perceive the use of artificial intelligence in organizational processes and customer orientation.

Recent research has shown that training in artificial intelligence within management programs strengthens students' ability to analyze complex information, improve decision-making, and understand the dynamics of customer behavior

[20]. Likewise, it has been shown that learning linked to intelligent technologies contributes to the development of strategic skills, such as adaptation to change, innovation in business models, and improvement of the customer experience [21]-[22]. Personalization is highly valued in today's labor markets, where data-driven management and service personalization have become critical factors for competitiveness [23].

However, the effective integration of artificial intelligence into business management education faces several barriers. Among the most relevant are limited digital literacy, lack of practical experience with AI tools, resistance to change in traditional pedagogical approaches, and the perception of ethical risks associated with the use of intelligent technologies [24]. These limitations highlight the need to analyze AI training from the perspective of the students themselves, considering both their learning and the perceived difficulties in applying it in real business management contexts [25]-[26].

Despite these advances, there remains an empirical gap in the Latin American context regarding how artificial intelligence training within business management programs translates into organizational perceptions and customer orientation from students' perspectives, especially in private institutions located in urban environments with heterogeneous technology adoption, such as Metropolitan Lima. This study contributes to closing that gap by evaluating an explanatory model linking AI training, organizational perceptions, and customer orientation, and by providing quantitative evidence for curriculum design and academic management [27].

Given this scenario, the present study aims to analyze how training in artificial intelligence applied to business management is associated with organizational perceptions and customer orientation among students at a private university in Lima, Peru [28]. From a quantitative and explanatory perspective, the relationships among AI training, understanding of organizational processes, and customer-oriented decision-making are examined based on students' training experience [29].

General objective

To analyze how training in artificial intelligence applied to business management influences the organizational perceptions and customer orientation of students at a private university in Lima, Peru.

Specific objectives

To identify the main business management skills that students develop from their training in artificial intelligence applied to organizational contexts.

To examine the relationship between training in artificial intelligence and customer-oriented decision-making from the perspective of business management students.

To analyze students' perceptions of the impact of artificial intelligence on organizational processes, knowledge management, and the company-customer relationship.

To identify the main educational, technological, and organizational barriers perceived by students to the practical application of artificial intelligence in business management.

Propose academic guidelines aimed at strengthening the integration of artificial intelligence in business management programs, with an emphasis on organizational training and customer orientation.

Two complementary approaches support the theoretical basis of the study. On the one hand, dynamic capabilities theory helps us understand how training in artificial intelligence contributes to the development of organizational skills for adaptation, learning, and innovation in changing environments [30]-[31]. On the other hand, the customer orientation approach in business management emphasizes aligning organizational decisions and the use of intelligent technologies with customers' needs, expectations, and experiences [32]-[33].

This study provides empirical evidence on the role of artificial intelligence in the training of business management students, with an emphasis on its organizational implications and customer orientation, based on the analysis of an explanatory model that integrates latent constructs and complex structural relationships [34]-[35]. In this context, the use of covariance-based structural equation modeling is methodologically relevant, as it allows simultaneous evaluation of the measurement model and the proposed causal relationships, ensuring theoretical consistency and statistical robustness in accordance with the guidelines established in the specialized literature [36]. In the Latin American context, research of this nature is key to guiding curriculum design, strengthening the link between universities and the productive environment, and contributing to the training of professionals capable of leading digital transformation processes in an ethical, strategic, and socially responsible manner [37]-[38].

II.METHODOLOGY

Study approach

This study adopts a correlational–explanatory quantitative approach to analyze the relationship between training in artificial intelligence applied to business management and perceptions of organizational and customer orientation among university students. The quantitative approach allows for the objective measurement of the constructs under analysis and the identification of significant relationships among latent variables using reliable, replicable statistical procedures. This methodological approach is relevant for evaluating the educational impact of artificial intelligence in educational contexts related to business management, decision-making, and the company-customer relationship [1]-[3].

Research design

The research design is non-experimental, explanatory, and cross-sectional. This design involves observing variables in their natural context, without deliberate manipulation, to identify significant associations among training in artificial intelligence, perceptions of organizational processes, and customer orientation. Data collection is conducted at a single point in time, enabling the analysis of relevant relational patterns in a real university educational environment, consistent with the study's explanatory objectives [13].

Population and sample

The target population consisted of undergraduate students enrolled in academic programs related to business management, administration, or related areas at a private university in Metropolitan Lima. The inclusion criteria considered were as follows:

Students enrolled in undergraduate programs related to business management.

Having received basic academic training in artificial intelligence, data analytics, or digital technologies applied to management.

Participation in courses or academic activities related to organizational processes, decision-making, or customer management.

Residence in Metropolitan Lima.

The sample size (n = 385) was defined as an adequate threshold for estimating CB-SEM models and achieving stability in the measurement of latent constructs. Non-probability convenience sampling was used, prioritizing accessibility, voluntary participation, and the academic relevance of the students to the phenomenon under study. Consequently, the findings are interpreted as evidence applied to the group analyzed, and their generalization should be done with caution.

Data collection instrument

The information was collected using a structured questionnaire with a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). The instrument was validated by experts in business management, higher education, and applied digital technologies. The questionnaire consisted of three main sections:

Training in artificial intelligence applied to management: use of AI tools, data analysis, process automation, and decision-making support.

Organizational perceptions: understanding of organizational processes, knowledge management, operational efficiency, and strategic decision-making.

Customer Orientation: service personalization, identification of customer needs, improvement of the user experience, and use of information for customer relationship management.

The AI training considered in this study includes exposure to tools such as data analytics platforms, predictive models, recommendation systems, and customer relationship management (CRM) systems supported by artificial intelligence.

Data collection

The survey was administered digitally through forms distributed via institutional virtual platforms. This method facilitated student participation from different academic programs and ensured adequate coverage across Metropolitan Lima. The data collection process took place over a period of approximately three weeks, ensuring voluntary participation, anonymity of respondents, and accessibility to the instrument.

Data analysis

The collected data were processed and analyzed using SPSS version 27 and AMOS statistical software, applying techniques consistent with the quantitative approach and the proposed theoretical model:

Descriptive analysis: calculation of means, standard deviations, and frequencies per item.

Reliability analysis: evaluation of internal consistency using Cronbach's alpha coefficient (values above 0.70) and composite reliability.

Convergent and discriminant validity: evaluated using the average extracted variance (AVE > 0.50) and the analysis of correlations between constructs.

Structural equation modeling using covariance (CB-SEM) is used to verify the statistical significance of the relationships between the latent variables in the model. In addition, the overall fit of the model was evaluated using standard CB-SEM indices (χ^2/gl, CFI, TLI, RMSEA, and SRMR). Standardized factor loadings, composite reliability (CR), and convergent validity (AVE) were used to assess the validity of the measurement model. Discriminant validity was verified using complementary criteria (Fornell–Larcker and the HTMT index) [38].

Measurement model (CFA): used to validate the factorial structure, verifying standardized loadings and consistency of the instrument prior to the evaluation of the structural model.

Standardized coefficients (β) and explained variance (R^2): used to determine the magnitude of the effects and the explanatory power of the model.

These techniques allowed the relationships proposed in the study to be empirically tested, ensuring statistical consistency and conceptual soundness.

Ethical considerations

The study was conducted in accordance with the ethical principles of social science and higher education research. The following were guaranteed:

Informed consent prior to student participation.

Anonymity and confidentiality in the processing of personal data.

Voluntary participation and the right to withdraw at any time without academic consequences.

Exclusive use of information for academic and research purposes.

The adopted methodological strategy ensures consistency among objectives, the theoretical framework, and analysis techniques. The quantitative, cross-sectional approach allows for the examination of associations between constructs, while CB-SEM facilitates the empirical evaluation of latent variables and their structural relationships, thereby strengthening the consistency of the proposed model.

III. RESULTS

Descriptive Analysis of the Sample

The sample consisted of 385 university students from a private university in Metropolitan Lima, Peru, who met the inclusion criteria established in the study methodology. In terms of gender distribution, 56% were women and 44% were men, indicating balanced participation across both groups. Regarding educational level, 100% of the participants were enrolled in undergraduate programs, mainly in fields related to business management, administration, and related areas.

Regarding academic and training experience in digital technologies, 62% of students reported receiving basic training in artificial intelligence applied to management, while 38% reported introductory or initial-level training. Likewise, the main areas in which students identified applications of artificial intelligence were business decision-making (45%), customer management and marketing (33%), and organizational process optimization (22%).

Among the main perceived limitations, the lack of practical experience in the use of artificial intelligence tools stood out, noted by 41% of respondents, suggesting the need to strengthen the applied components within business management training programs.

TABLE I
SAMPLE PROFILE

Characteristic	Percentage
Gender: Women	56%
Gender: Men	44%
Undergraduate students	100%
Basic training in AI applied to management	62%
Introductory training in AI	38%
Application in decision-making	45%
Application in customer management	33%
Application in organizational processes	22%

Validation of the Measurement Model

The measurement model demonstrated adequate reliability and validity, confirming the instrument's consistency. Cronbach's alpha values were above 0.70 in all constructs analyzed, indicating high internal consistency. Composite reliability ranged from 0.81 to 0.92, exceeding the minimum values recommended in the literature.

Likewise, the average extracted variance (AVE) was above 0.50 across all dimensions, confirming the model's convergent validity. These results indicate that the items used adequately represent the theoretical constructs related to training in artificial intelligence, organizational perceptions, and customer orientation.

TABLE II
PSYCHOMETRIC INDICATORS

Indicator	Standard value	Result
Cronbach's alpha	> 0.70	Achieved
Composite reliability	0.81–0.92	Met
AVE (Convergent validity)	> 0.50	Met

Likewise, the overall fit of the model was evaluated using standard CB-SEM indices (χ^2/df, CFI, TLI, RMSEA, and SRMR), which allowed us to continue with the interpretation of the structural model.

Structural Relationships of the Model

The structural model results are summarized in Table III. The findings indicate statistically significant relationships among the analyzed constructs, confirming the proposed relationships between artificial intelligence training, organizational perceptions, and customer orientation.

TABLE III
PATH COEFFICIENTS (β)

Relationship	β	p-value
AI training → Organizational perceptions	0.61	< 0.001
Organizational perceptions → Customer orientation	0.55	< 0.01
AI training → Customer orientation	0.48	< 0.05

Explained variance (R^2)

The explained variance values for the endogenous constructs are presented in Table IV, indicating moderate predictive power of the model.

TABLE IV
EXPLAINED VARIANCE (R^2)

Construct	R^2
Organizational perceptions	0.57
Customer orientation	0.52

Identification of barriers to implementation

Students identified several barriers that limit the effective integration of artificial intelligence into their business management training. The main barriers reported were:

Lack of practical experience with AI tools (41%)
Limitations in technological infrastructure (34%)
Poor integration of AI content into the curriculum (27%)
Perception of ethical risks and misuse of data (21%)

TABLE V
BARRIERS TO AI IMPLEMENTATION

Barrier	Percentage
Lack of practical experience	41%
Limited technological infrastructure	34%
Insufficient curriculum integration	27%
Perceived ethical risks	21%

General interpretation of results

The results indicate that training in artificial intelligence applied to business management is significantly associated with organizational perceptions and customer orientation among university students. These findings support the relevance of integrating intelligent technologies into management education and confirm their role in strengthening organizational understanding and customer-oriented decision-making.

Likewise, the significant association between organizational perceptions and customer orientation suggests that a systemic understanding of AI uses favors more strategic, customer-centric management.

However, the barriers identified reflect the need to strengthen the practical components, technological infrastructure, and curricular integration of artificial intelligence in academic programs.

In summary, this chapter demonstrates, based on solid empirical evidence, that artificial intelligence is a key element in the training of business management students. The results support its strategic incorporation into higher education, aimed at developing organizational and customer management skills, aligned with the demands of the contemporary business environment.

IV. DISCUSSION

The incorporation of artificial intelligence (AI) into business management education has become a strategic focus for training professionals to respond to organizational environments characterized by high complexity, dynamism, and customer orientation. In this context, the present study, conducted with students from a private university in Lima, Peru, provides consistent empirical evidence demonstrating that training in AI applied to management is significantly associated with both organizational perceptions and customer orientation. Likewise, the results allow us to identify training and structural barriers that condition the effective integration of artificial intelligence into business management academic programs [24]-[26].

These findings can be further interpreted through the lens of organizational learning and capability development theories, which suggest that the integration of technological knowledge enhances the ability of individuals and organizations to adapt, reconfigure resources, and respond to dynamic market conditions. In this sense, artificial intelligence training not only contributes to technical skill development but also strengthens higher-order organizational capabilities related to learning, innovation, and customer value creation.

Training in artificial intelligence and organizational perceptions

The results of the structural model indicate a positive, highly significant relationship between training in artificial intelligence applied to business management and students' organizational perceptions ($\beta = 0.61$; $p < 0.001$). This finding supports the dynamic capabilities theory, which holds that the development of technological skills strengthens the ability to adapt, learn, and reconfigure resources in the face of changing environments. From an educational perspective, AI training enables students to gain a deeper understanding of organizational processes, knowledge management, and data-driven decision-making, which are fundamental to contemporary business management [12].

Likewise, this result suggests that incorporating artificial intelligence into university education should not be limited to

teaching isolated tools but should be conceived as a cross-cutting component of the curriculum. By integrating AI in a structured way, students develop a systemic view of the organization, recognizing the strategic role that intelligent technologies play in operational efficiency and business competitiveness [13].

Organizational perceptions and customer orientation

The analysis also revealed a significant relationship between organizational perceptions and customer orientation ($\beta = 0.55$; $p < 0.01$). This result indicates that students who better understand the impact of artificial intelligence on organizational processes tend to adopt a more customer-centric perspective. From a customer orientation perspective, this finding reinforces the idea that organizational and strategic decisions must be aligned with the creation of value for the end user [7]-[19].

Artificial intelligence facilitates the analysis of information on customer preferences, behaviors, and needs, which contributes to the personalization of products and services. In the educational field, understanding these processes enables students to integrate organizational efficiency with customer experience-oriented management, an aspect particularly relevant in highly competitive markets such as Lima [3].

Direct effect of AI training on customer orientation

In addition to the indirect effect mediated by organizational perceptions, the results show a direct effect of artificial intelligence training on customer orientation ($\beta = 0.48$; $p < 0.05$). This finding suggests that exposure to AI content and applications can immediately influence how students conceive of customer management, even before they have fully consolidated a deep understanding of organizational processes [13].

From an educational perspective, this result highlights that learning practical AI applications (such as recommendation systems, predictive analytics, or customer relationship management tools) directly contributes to developing a more customer-oriented vision. However, this effect also highlights the importance of accompanying technological training with content on ethical and social responsibility to promote the appropriate and transparent use of information [5].

Interpretation of explained variance and model robustness

The explained variance values obtained in the structural model ($R^2 = 57\%$ for organizational perceptions and $R^2 = 52\%$ for customer orientation) show moderate explanatory power, consistent with research in the social sciences and education. These results confirm that training in artificial intelligence is a relevant predictor of the development of organizational and customer-orientation competencies in business management students [5].

The model's robustness supports the relevance of the adopted methodological approach. It reinforces the empirical validity of the proposed relationships, providing consistent evidence for the design of academic programs that strategically integrate intelligent technologies [6].

Barriers to the integration of artificial intelligence in training

Despite the identified positive effects, the results reveal significant barriers that limit the effective integration of artificial intelligence into business management education. The lack of practical experience with AI tools is the main difficulty, followed by limitations in technological infrastructure, poor curriculum integration, and ethical concerns about data use. These barriers reflect a gap between theoretical teaching and the practical application of artificial intelligence in real management contexts [21].

From an institutional perspective, these findings suggest strengthening the practical components of the curriculum, improving access to technological resources, and promoting the progressive, coordinated integration of AI across academic training. Likewise, there is evidence of the importance of incorporating content related to ethics, privacy, and data governance as an integral part of business management training [24].

Academic implications and future projections

The study's findings have significant implications for academic management and curriculum design in higher education. First, it is recommended to promote teacher training in artificial intelligence applied to management, as well as the development of training spaces that facilitate experiential learning. The creation of data analytics laboratories applied projects with companies, and decision-making simulations could help reduce the barriers identified and strengthen customer orientation [12].

In terms of curriculum, it is recommended to incorporate applied AI modules focused on management (analytics for decision-making, process automation, and customer analytics/CRM), as well as assessment activities based on real projects and cases. These actions would allow technological learning to be translated into observable organizational management and customer orientation skills [18].

Regarding future lines of research, it is suggested that longitudinal studies be developed to analyze the sustained impact of artificial intelligence training on students' professional trajectories. Likewise, comparative research between different institutions or regions could provide a broader understanding of the contextual factors that influence the adoption of AI in business management education. Finally, integrating artificial intelligence with active learning methodologies represents a promising avenue for enhancing the development of organizational and customer-centric

competencies [11]. Future research could also explore cross-country comparisons to identify contextual differences in AI adoption and its educational impact.

In summary, this study's results confirm that training in artificial intelligence applied to business management plays a key role in strengthening organizational perceptions and developing customer orientation among university students. However, consolidating these benefits requires a comprehensive institutional approach that articulates curriculum, technological resources, training practices, and ethical principles, thereby enabling training aligned with the demands of the contemporary business environment and the challenges of digital transformation.

V. CONCLUSIONS

This study rigorously analyzed the impact of training in artificial intelligence applied to business management on students' organizational perceptions and customer orientation at a private university in Lima, Peru. Using an explanatory quantitative approach and structural equation modeling, solid empirical evidence was obtained, confirming the relevance of artificial intelligence as a strategic component in university business management training, as well as the challenges that persist in its effective integration into the academic curriculum.

Achievement of the study objectives

The overall objective of the research was fully achieved, as it was demonstrated that training in artificial intelligence applied to business management is significantly associated with both organizational perceptions and student customer orientation. In particular, the results showed a positive and significant relationship between AI training and organizational perceptions, as well as between these perceptions and customer orientation. Likewise, a direct effect of AI training on customer orientation was confirmed, highlighting the educational value of intelligent technologies from the early stages of professional training.

In relation to the specific objectives, the study made it possible to:

Identify key competencies strengthened by artificial intelligence training, highlighting understanding of organizational processes, data-driven decision-making, and customer-oriented strategic management.

Examine the relationship between AI training and customer-centric decision-making, demonstrating that the use of smart technologies supports more personalized, value-oriented management practices.

Analyze student perceptions of the impact of artificial intelligence on knowledge management, organizational processes, and the company-customer relationship, confirming a more systemic view of business management.

Identify relevant barriers to the effective integration of artificial intelligence, among which the lack of practical experience with AI tools, limitations in technological infrastructure, and insufficient curricular integration of these contents stood out.

Propose academic guidelines aimed at strengthening the incorporation of artificial intelligence in business management programs, with an emphasis on organizational training, customer orientation, and the ethical use of information.

Contribution of artificial intelligence to university education in business management

The findings confirm that artificial intelligence applied to business management is a highly valuable training resource for higher education. In the context of Metropolitan Lima, characterized by heterogeneous adoption of digital technologies and growing business competition, AI training prepares students for complex organizational environments where data analytics, automation, and service personalization are determining factors.

Likewise, it was evident that training in artificial intelligence not only contributes to the development of technical skills but also strengthens a strategic understanding of the organization and promotes a more consistent customer focus. In this way, university education in business management is positioned as a key space for training professionals capable of leading digital transformation processes in an informed, strategic, and responsible manner.

Barriers, opportunities, and practical implications

Despite the positive results, the study identified barriers that limit the effective integration of artificial intelligence into university education. Insufficient practical experience, technological infrastructure constraints, curricular fragmentation, and ethical concerns associated with data use represent challenges that must be addressed institutionally.

However, these limitations also reveal opportunities for improvement. The creation of business analytics and simulation laboratories, teacher training in emerging technologies, and the progressive integration of artificial intelligence content into the curriculum can help close the gap between theory and practice. Likewise, the cross-cutting incorporation of ethical and data governance principles is essential to ensure training is aligned with current social and organizational demands.

Implications and future lines of research

From an academic and educational management perspective, the study's results suggest the need to strengthen the strategic integration of artificial intelligence into business management programs, promoting applied learning experiences focused on decision-making and customer management. For

education policymakers, the findings support the importance of promoting initiatives that facilitate access to digital technologies and encourage curricular innovation in higher education. For the business sector, the value of establishing partnerships with universities to develop training projects aligned with real management challenges and customer orientation is highlighted.

In terms of future research, it is recommended to analyze the longitudinal impact of artificial intelligence training on graduates' professional trajectories and employability, as well as to conduct comparative studies across institutions and regions. Additionally, exploring the integration of artificial intelligence with active learning methodologies and other emerging technologies could broaden the understanding of its educational potential in business management education.

In summary, artificial intelligence applied to business management is positioned as an essential component of contemporary university education. Its strategic integration strengthens organizational perceptions, promotes a more solid customer focus, and prepares students to face the challenges of digital transformation. By overcoming the identified barriers and taking advantage of the opportunities in the environment, universities can consolidate their position as key agents in the training of professionals capable of generating organizational and social value from an innovative, ethical, and sustainable perspective.

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