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ChatGPT in the university classroom: perceptions, perceived usefulness and use intentions among undergraduate students

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ABSTRACT

The objectives of the present study are to analyze university students' perceptions of and attitudes toward ChatGPT as a support tool for learning, as well as the user profiles derived from their technological acceptance, were analyzed. A quantitative, nonexperimental and cross-sectional design was applied to a non-probabilistic convenience sample of 438 undergraduate students, and a validated questionnaire composed of three dimensions compatibility with learning styles, ease of use and perceived usefulness, and continued use intentions was used. The data were analyzed with hierarchical cluster analysis (Ward method). The results reveal three groups of users: i) enthusiasts, with highly favorable perceptions and high use intentions; ii) moderate users, who exhibit partial acceptance; and iii) critical or disconnected users, who have a negative view of the tool. Taken together, the findings confirm that perceived usefulness, ease of use and trust are determining factors in the intention to use ChatGPT. This study provides empirical evidence on the diversity of attitudes toward generative artificial intelligence (GenAI) in university contexts and highlights the need to promote institutional strategies of critical digital literacy and teacher training for its ethical and pedagogical integration.

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1. INTRODUCTION

The emergence of generative artificial intelligence (GenAI) has rapidly transformed university ecosystems, and ChatGPT stands out as a tool that is being increasingly integrated into study routines, writing support, and task completion [1], [2]. Recent research has indicated that students' acceptance of these technologies depends on several psychological, technological and sociocultural factors [3], [4]. In addition, research has shown that the student body is not homogeneous; instead, it is distributed across segments or user profiles with different attitudes and motivations, such as "skeptics", "moderate users", "positive acceptors", and "AI innovators" [5], [6]. In this scenario, analyzing university students' perceptions of ChatGPT and identifying groups of users constitute a key step in guiding policies and practices of evidence-based pedagogical integration.

The most influential technology adoption frameworks in education, such as the technology acceptance model (TAM) and the unified theory of acceptance and use of technology (UTAUT/UTAUT2), explain the intention to use technology on the basis of perceived usefulness, ease of use, social influence and facilitating conditions, with extensions that include enjoyment/hedonism, habits, valued price and other antecedents [7]–[9]. These models are also relevant for understanding the student body's acceptance of

GenAI, particularly when combined with multivariate approaches that allow the description of user profiles [10]. In Generation Z populations, for example, a study that integrated the TAM and UTAUT and combined partial least squares structural equation modeling (PLS-SEM) with cluster analysis showed that "perceived enjoyment" is the strongest predictor of use intentions (β=0.605), followed by utility, and that there are four segments that are clearly distinguishable according to their technological openness and behavioral intentions [5], [6].

Moreover, expanded frameworks and integrated approaches reveal that in contexts where social architecture and institutional trust are more important, social determinants such as subjective norms and trust in AI are more important that purely individual or hedonic motivators [11]. The ThaiGAM model, which synthesizes the theory of planned behavior (TPB) and TAM2 and incorporates trust and privacy, reveals that the diffusion of GenAI depends mainly on social dynamics and trust at the institutional level rather than utilitarian calculations; in addition, it documents the coexistence of critical trust, where greater trust coexists with greater awareness of privacy [12]. Similar findings in an SEM/partial least squares (PLS) study with university students indicate that institutional support, social influence, trust–security, the characteristics of the task and technology, and individual traits drive use intentions (R^2=0.61), whereas hedonism and innovativeness are not significant in this context, highlighting the weight of external and normative factors in higher education [13].

Complementing the previous research, the literature on trust and privacy in educational environments suggests that concerns about data reduce use intentions but that trust (in the reliability, transparency and safeguarding of data) can mitigate these concerns and improve attitudes toward GenAI [14]–[16]. In summary, the TAM/UTAUT, the TPB and extensions involving trust–privacy frameworks provide robust scaffolding to examine perceptions of and behaviors toward ChatGPT, while multivariate methods (SEM, conglomeration) make it possible to profile groups of users with explanatory and practical value. Despite the progress described, at least three recently described and relevant gaps, such as the dependence on a single framework and the need for theoretical and contextual integration, justify the present study. Several studies indicate that studies on ChatGPT in higher education tend to rely on a single framework, such as the TAM or UTAUT, which can restrict the spectrum of variables and relationships examined. It is necessary to integrate perspectives and organizational variables such as institutional support, trust and security for a more complete understanding [17].

Another aspect is sample/temporal limitations and limited generalizability. Research with solid methodologies, such as PLS-SEM + clusters, recognizes limitations related to being transversal, being self-contained in a single institution and culture, and omitting key psychosocial variables such as trust and ethical risks. Such research recommends increasing the number of factors and comparability and characterizing user segments with greater accuracy [18]. Additionally, profiles and configurations that connect individual and social factors are lacking. Although some studies already identify student segments, in these studies, little work has been done in linking perceptions (utility, ease, enjoyment, trust/privacy, institutional support) with user profiles constructed through multivariate analysis to generate segmentation approaches with implications for teaching and management strategies [13].

Addressing these gaps is pertinent since curricular, training and digital governance decisions such as responsible use guidelines require knowing not only which factors matter but also for whom and in what combination, which requires analysis that identifies groups of users and their differential traits. In line with the discussion, the objective of this study is to analyze university students' perceptions of the use of ChatGPT as a support tool for learning and to identify possible groupings or user profiles through multivariate analysis [6]. Additionally, the following hypotheses are proposed:

- Perceived usefulness, perceived ease of use, and compatibility with learning styles are positively associated with the continuous intention to use ChatGPT (H1).
- Distinct student profiles exist according to their levels of perception and attitude toward ChatGPT (H2).

2. METHOD

2.1. Approach and research design

The present research was developed under a quantitative, nonexperimental approach and with a descriptive–correlational cross-sectional design. The study was based on the application of hierarchical cluster analysis techniques, which made it possible to characterize different levels of perceptions of and intentions to use ChatGPT.

2.2. Population and sample

The population consisted of university students enrolled in undergraduate programs belonging to various areas of training at the National University of the Altiplano, Peru. Nonprobabilistic convenience

sampling was used, and participants who expressed interest and who were available to complete the questionnaire voluntarily were included. Although this approach facilitated access to participants and ensured a sufficient sample size for multivariate analysis, it may introduce selection bias, as participants who voluntarily respond to surveys about educational technology could have more favorable attitudes toward digital tools. Therefore, the results should be interpreted with caution, and future studies are encouraged to employ probabilistic sampling methods or multi-institutional designs to enhance external validity.

The final sample consisted of 438 students majoring in early childhood education (21), primary education (247), and secondary education (170). The sample consisted of more women (327) than men (111). The average age of the participants was 21 years, with the minimum age being 17 years and the maximum age being 38 years. The students were in different cycles of study from first to ninth, with the sixth cycle (60), fourth cycle (85) and third cycle (101) being the most common. The area of residence was mostly urban (314), with some rural (124). Regarding their employment situation, the students mostly worked part-time (254), and some only studied and did not work (184).

2.3. Data collection instrument

To obtain data, a structured questionnaire, called perception and use of ChatGPT in university learning (PUC-AU), was designed and developed ad hoc on the basis of the recent literature on the technological acceptance and educational perception of artificial intelligence [6]. The instrument consisted of two sections.

- Sociodemographic section: this section collected information on gender, age, area of residence, cycle of study, major and employment situation.
- Perception section: this section included 12 items distributed in three dimensions: compatibility with learning styles (CLS), with 3 items; ease of use and perceived usefulness (PU), with 6 items; and continued use intentions (CUI), with 3 items. Each item was scored using a five-point Likert scale ranging from 1=strongly disagree to 5=strongly agree. The selection of the three dimensions is grounded in the theoretical frameworks of TAM and UTAUT. The CLS dimension was included because the adoption of an educational tool depends not only on its functional attributes, but also on its perceived fit with students' cognitive preferences and study strategies; technology is more readily accepted when aligned with users' needs and practices. Furthermore, the PU dimension is based on the core explanatory model of TAM, which posits that perceived usefulness and perceived ease of use are central determinants of technology acceptance, particularly in university settings where efficiency, comprehension, and time optimization are key variables. Finally, the CUI dimension was incorporated based on continuous intention models, which suggest that true adoption is consolidated when users demonstrate a sustained willingness to continue using the tool in the future.

The content validity of the questionnaire was reviewed by three experts in education and emerging technologies, who evaluated the relevance, clarity and coherence of the items. Similarly, a pilot test was conducted with a small group of students to verify the clarity and reliability of the instrument, yielding a Cronbach's α reliability coefficient of 0.91, which indicates adequate internal consistency.

2.4. Procedure

The questionnaire was administered virtually through Google Forms, accompanied by an informed consent form that guaranteed voluntary participation and confidentiality of the data. The students received the link for the form through institutional WhatsApp groups or by email. Data collection was carried out during the first semester of the 2025 academic year, from May to July. Once data collection was completed, the data were exported and refined in Microsoft Excel and subsequently analyzed in SPSS (version 26).

2.5. Data analysis techniques

First, descriptive statistics (means, standard deviations and frequencies) were applied to characterize the responses by item and dimension. Subsequently, principal component analysis (PCA) was conducted to reduce the dimensionality of the variables and to explore the underlying structure of the perceptions. Based on the factorial scores obtained, a hierarchical cluster analysis was performed via the Ward method, with the squared Euclidean distance used as a measure of similarity.

This procedure allowed the participants to be grouped into three different clusters, whose profiles were interpreted based on their means by item and dimension. Finally, the results were visualized via scatter plots to represent the differences between groups and to facilitate the multivariate interpretation of the perceptions studied. The study was conducted in accordance with the ethical principles of educational research established by the Declaration of Helsinki and institutional rules regarding confidentiality. All participants provided informed consent, and anonymization of the data and their exclusive use for scientific and academic purposes were guaranteed.

3. RESULTS AND DISCUSSION

Hierarchical cluster analysis, applied via the Ward method, made it possible to identify three different groups of students according to their perceptions of the use of ChatGPT in university learning. The dimensions analyzed were compatibility with learning styles, ease of use and perceived usefulness, and continued use intentions. Table 1 shows the means obtained for each cluster, and Figure 1 shows the graphical distribution of the groups based on the factorial scores.

Table 1. Means per item and group according to the Ward method

Questions	Cluster		
	1	2	3
ChatGPT adapts to my personal way of learning.	4.886	3.891	2.845
Using ChatGPT effectively complements my study methods.	4.909	3.859	2.822
I feel that ChatGPT responds adequately to my learning needs.	4.909	3.736	3.144
ChatGPT is easy to use even without advanced technical knowledge.	4.886	3.923	3.144
The design and operation of ChatGPT facilitate its use.	4.886	4.023	3.144
ChatGPT has helped me to better understand academic topics.	4.909	4.123	3.207
The information provided by ChatGPT is useful for my studies.	4.818	4.014	3.069
ChatGPT has allowed me to save time in my academic tasks.	4.977	4.059	3.247
I consider ChatGPT to be a valuable tool for supporting my learning.	4.932	4.114	3.144
I intend to continue using ChatGPT for my studies.	5.000	3.995	3.109
I would recommend ChatGPT to other students.	4.977	4.018	3.023
I would like to explore more functions of ChatGPT in my academic activities.	4.977	4.191	3.322

3.1. Descriptive analysis by cluster

Cluster 1 is characterized by the highest average values in all dimensions of the questionnaire, with scores close to 4.9 for most items. This group shows a high compatibility of ChatGPT with the learning styles of the students, a positive perception of its usefulness and ease of use, and a strong intention to continue using the tool. Therefore, the members of this cluster can be considered enthusiastic and competent users who integrate ChatGPT effectively into their learning process.

Cluster 2, with mean values between 3.9 and 4.1, has a moderately favorable perception. The students in this group recognize the usefulness of ChatGPT and its potential as a support tool, although its level of appropriation and frequency of use are lower. This group represents adaptive users, who use ChatGPT as a complement but still have certain reservations or limitations regarding its use in their studies.

Cluster 3 presents the lowest values (between 2.6 and 3.2), which indicates low compatibility, low perceived usefulness and low future use intentions. These results suggest a limited or negative perception of the use of ChatGPT, possibly associated with ignorance regarding its functionalities, technical difficulties or reticent attitudes toward tools based on artificial intelligence. This group could be considered critical or disconnected users who still do not integrate technology into their learning in a significant way. In global terms, the total average of the dimensions shows a favorable general assessment (3.7/5), which indicates that, as a whole, university students perceive ChatGPT as a useful resource and as adaptable to their training needs, although with notable differences between subgroups.

3.2. Graphic analysis and multivariate interpretation

Figure 1 presents the dispersion of the three clusters as a function of the first two factors obtained by PCA. Each point represents a student, and the color corresponds to the group assigned by the Ward method. In the factorial plane, a clear segmentation of the groups is observed:

- Cluster 1 (blue) is located in the upper right part of the graph and is associated with positive scores for both factors, representing students with very high perceptions of and proactive attitudes toward ChatGPT.
- Cluster 2 (green) occupies the central zone, showing intermediate scores and a position of equilibrium between acceptance and reserve.
- Cluster 3 (yellow) is concentrated in the lower left, with negative scores, reflecting low perceptions and less willingness to continue use.

The distribution confirms the heterogeneity of the student body, showing that the use of ChatGPT is not homogeneous but varies according to the level of technological compatibility and individual learning experiences with assistance from artificial intelligence.

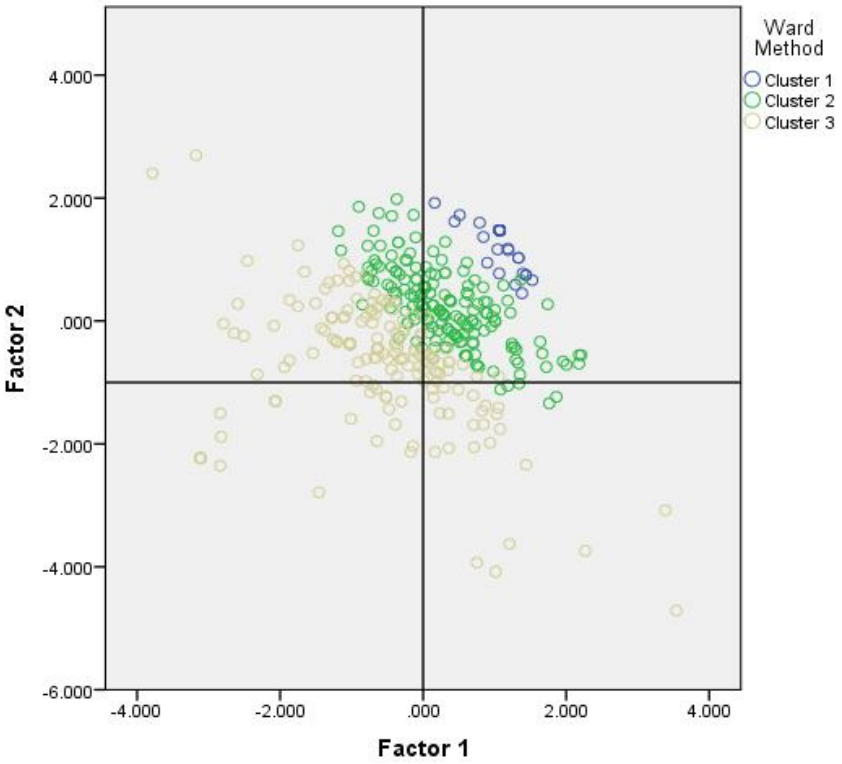

Figure 1. Distribution of students according to factorial scores (Ward's method)

3.3. Discussion

In this study, university students' perceptions of and attitudes toward ChatGPT as an educational tool were analyzed, and three different user profiles were identified: enthusiastic, moderate and critical. The results show that the majority of the participants have a positive perception of the compatibility of ChatGPT with their learning styles, as well as a high valuation of its usefulness and ease of use [19], [20]. These findings partially support the initial hypothesis and show that individual and contextual factors significantly influence continued use intentions. Taken together, the results confirm the relevance of student perceptions and attitudes as determinants of the effective adoption of artificial intelligence-based tools in the university environment [21], [22].

It was found that students from the enthusiastic group believe that ChatGPT adapts to their personal ways of learning and complements their study methods. This result coincides with the findings reported by [1], [2], who highlight that the perception of compatibility promotes the pedagogical integration of generative AI. The positive relationship between compatibility and acceptance suggests that students who perceive coherence between their learning strategies and the features of ChatGPT show greater willingness to continue to use ChatGPT [21]. The reason for this pattern could be that ChatGPT offers immediate feedback, promotes self-regulation and stimulates active learning, which are factors that have already been identified as promoters of academic engagement [7]. Taken together, the findings reinforce the need to design training strategies that align the functions of AI with the cognitive styles of students.

Another relevant finding is the high score assigned to ease of use and perceived usefulness. Students value the intuitive interface of ChatGPT and its ability to simplify complex tasks, which results in an increase in the perception of academic efficiency [23], [24]. This result coincides with the findings of previous studies showing that ease of use and perceived usefulness are the most robust predictors of intentions to use in the TAM and UTAUT, as applied to educational technologies [8], [9]. However, some authors warn that technological familiarity and the degree of digital literacy can modulate this relationship [18]. In this sense, the high valuation observed could be explained by the level of students' exposure to digital environments, which suggests that previous digital competences strengthen adoption and satisfaction with ChatGPT.

The results of the cluster analysis reveal three profiles of users, namely, enthusiastic, moderate and critical, which confirms the heterogeneity of the student body. These findings agree with those of [5], [6], who identify similar profiles of ChatGPT adoption in higher education. Enthusiastic users show high compatibility and perceived usefulness, whereas critics express distrust or little knowledge about the ethical

and responsible use of AI. This pattern suggests that use intentions do not depend exclusively on instrumental factors; rather, they also depend on institutional trust, the perception of security and social norms [12], [14]. Therefore, university management should consider different training and coaching strategies for each profile to promote both critical digital literacy and confidence in the educational use of AI.

Among the main strengths of this study is the application of multivariate analyses (PCA and hierarchical clustering), which allowed us to characterize user profiles with greater precision and to overcome the limitations of unidimensional approaches that are focused only on perceived usefulness. Similarly, the instrument used showed adequate internal consistency (α=0.91) and a theoretically validated structure. However, the study has limitations inherent to cross-sectional designs and nonprobabilistic sampling, which restrict the generalizability of the results. In addition, variables such as AI literacy, previous experience and ethical perceptions of the use of ChatGPT, which could enrich the analysis of profiles in future research, were not considered. However, these limitations were mitigated through the use of robust statistical techniques and validation by experts in the instrument construction process.

These findings also have important practical implications for teaching practice in higher education. The identification of differentiated user profiles suggests that a uniform strategy for integrating generative AI tools such as ChatGPT may not be effective for all students [25], [26]. Enthusiastic users may benefit from advanced pedagogical activities that encourage critical dialogue with AI-generated content, such as reflective writing, problem-based learning, and collaborative knowledge construction [27]. In contrast, moderate and critical users may require structured guidance to develop confidence in the technology and to understand its academic potential and limitations. Consequently, instructors should design learning activities that promote AI-assisted inquiry, critical evaluation of AI-generated information, and metacognitive reflection, thereby transforming ChatGPT from a simple productivity tool into a resource that supports deeper learning processes [28], [29].

From a policy and institutional perspective, the results highlight the need for universities to establish clear frameworks for the responsible integration of generative AI in teaching and learning. Institutional policies should include guidelines for ethical use, data privacy protection, and academic integrity, while also providing professional development opportunities that help faculty integrate AI-based tools into their pedagogical practices [30], [31]. In addition, universities should promote initiatives aimed at strengthening AI literacy and critical digital competence among students, enabling them to use these technologies in an informed and responsible manner. By recognizing the diversity of student perceptions and adoption patterns, educational institutions can design targeted support strategies that foster equitable access to AI-enhanced learning environments and ensure that the pedagogical potential of generative AI contributes to meaningful and sustainable educational innovation [32].

In summary, the results of this study provide empirical evidence of the diversity of perceptions of and attitudes toward ChatGPT as an educational tool, demonstrating that its acceptance depends on both individual (compatibility, ease, usefulness) factors and social and institutional (trust, support) factors. These findings contribute to the current debate on the ethical and pedagogical integration of artificial intelligence in higher education and suggest the need for teacher and student training programs aimed at developing critical digital skills and the responsible use of generative AI. Future research should incorporate longitudinal and comparative designs between institutions and disciplines to understand the evolution of attitudes toward ChatGPT and its real impact on teaching–learning processes.

4. CONCLUSION

The study shows that university students' perceptions of ChatGPT as an educational tool are predominantly positive, although heterogeneous, with three distinct profiles identified: enthusiastic, moderate, and critical users. This segmentation confirms that the adoption of artificial intelligence in education is shaped by a combination of personal, contextual, and institutional factors. From a theoretical perspective, the findings support the TAM and UTAUT models by highlighting perceived usefulness, ease of use, and enjoyment as key determinants of continuous intention to use, while also suggesting the need to expand these frameworks to incorporate variables such as trust, privacy, and institutional support. Practically, the results emphasize the importance of promoting critical digital literacy, faculty training, and ethical guidelines to ensure responsible integration of ChatGPT. Although the cross-sectional design limits generalizability, the multivariate approach enabled the identification of user profiles with explanatory value. Overall, the study provides relevant empirical evidence on the educational adoption of ChatGPT and reinforces its transformative potential when guided by principles of ethics and critical engagement. Future research should incorporate longitudinal and comparative designs, as well as variables related to technological trust, creativity, and digital ethics, in order to further examine the impact of GenAI on motivation, academic performance, and teaching–learning processes.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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Vidnay Noel Valero-Ancco	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

INFORMED CONSENT

All participants gave their consent to participate in this research and for data collection.

ETHICAL APPROVAL

Research involving the use of human beings has complied with all relevant national regulations and institutional policies in accordance with the principles of the Declaration of Helsinki. The project has been approved by the Research Project Review Committee of Faculty Researchers of the Research Institute of the National University of the Altiplano.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [VNV-A], upon reasonable request.

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