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ORIGINAL

Attitude Towards Research in Formative Research Among University Students: An Analysis from the Perspective of Autonomous Investigative Learning

Actitud hacia la investigación en la investigación formativa en estudiantes universitarios: Un análisis de la perspectiva del aprendizaje investigativo autónomo

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ABSTRACT

Introduction: research attitudes and autonomous investigative learning are crucial for the development of scientific competencies in higher education. This study explored the relationship between university students' attitudes toward research and their perspective on autonomous investigative learning within the framework of formative investigation. The aim was to determine the extent to which positive research attitudes contribute to students' perceived ability to engage in independent research activities.
Method: a quantitative, cross-sectional, correlational design was employed with a sample of 350 university students from various faculties. Data was collected using a validated questionnaire measuring three dimensions of research attitude (affective, cognitive, behavioral) and a scale assessing the autonomous investigative learning perspective. Descriptive statistics, Spearman's rho correlation, and linear regression analyses were conducted to examine relationships between variables. Ethical principles, including informed consent, voluntary participation, and confidentiality, were strictly observed.
Results: findings indicated moderately favorable attitudes toward research, with higher scores in the affective (M = 3,92) and cognitive (M = 3,85) dimensions, and slightly lower behavioral scores (M = 3,56). A strong, positive correlation was found between attitudes toward research and autonomous investigative learning (ρ = 0,642, $p < 0,001$). Regression analysis showed that attitudes toward research explained 57,1 % of the variance in autonomous learning (R^2 = 0,571, $p < 0,001$), with each one-point increase in attitude score predicting a 0,58-point increase in autonomy score. Health sciences students reported higher scores compared to social sciences and engineering students.
Conclusions: the results confirm that favorable research attitudes significantly enhance students' perceived capacity for autonomous investigative learning. To close the gap between positive perception and active engagement, higher education institutions should integrate research experiences early in the curriculum, provide structured mentorship, and ensure equitable access to research opportunities across faculties.

Keywords: Attitude Toward Research; Formative Research; Autonomous Investigative Learning; Higher Education; Correlational Analysis.

RESUMEN

Introducción: la actitud hacia la investigación y el aprendizaje investigativo autónomo son elementos esenciales para el desarrollo de competencias científicas en la educación superior. Este estudio exploró la relación entre la actitud de los estudiantes universitarios hacia la investigación y su perspectiva sobre.

el aprendizaje investigativo autónomo, dentro del marco de la investigación formativa. El objetivo fue determinar en qué medida las actitudes positivas hacia la investigación contribuyen a la capacidad percibida de los estudiantes para realizar actividades de investigación de manera independiente.
Método: se empleó un diseño cuantitativo, transversal y correlacional con una muestra de 350 estudiantes universitarios de distintas facultades. Los datos se recopilaron mediante un cuestionario validado que midió tres dimensiones de la actitud hacia la investigación (afectiva, cognitiva y conductual) y una escala que evaluó la perspectiva del aprendizaje investigativo autónomo. Se aplicaron estadísticas descriptivas, correlación de Spearman y análisis de regresión lineal para examinar la relación entre las variables. Se cumplieron estrictamente los principios éticos de consentimiento informado, participación voluntaria y confidencialidad.
Resultados: los resultados mostraron actitudes moderadamente favorables hacia la investigación, con mayores puntuaciones en la dimensión afectiva (M = 3,92) y cognitiva (M = 3,85), y puntuaciones ligeramente menores en la dimensión conductual (M = 3,56). Se encontró una correlación positiva fuerte entre la actitud hacia la investigación y el aprendizaje investigativo autónomo ($\rho = 0,642$, $p < 0,001$). El análisis de regresión mostró que la actitud hacia la investigación explicó el 57,1 % de la varianza en el aprendizaje autónomo ($R^2 = 0,571$, $p < 0,001$), con un incremento de 0,58 puntos en el puntaje de autonomía por cada punto adicional en actitud. Los estudiantes de ciencias de la salud reportaron puntajes más altos en comparación con los de ciencias sociales e ingeniería.
Conclusiones: los resultados confirman que las actitudes favorables hacia la investigación fortalecen significativamente la capacidad percibida de los estudiantes para desarrollar aprendizaje investigativo autónomo. Para cerrar la brecha entre percepción positiva y participación activa, las instituciones de educación superior deben integrar experiencias de investigación desde etapas tempranas del currículo, ofrecer mentorías estructuradas y garantizar igualdad de acceso a oportunidades investigativas entre facultades.

Palabras clave: Actitud hacia la Investigación; Investigación Formativa; Aprendizaje Investigativo Autónomo; Educación Superior; Análisis Correlacional.

INTRODUCTION

Global studies indicate that participation in undergraduate research programs has grown across many regions, including the Americas, Europe, Asia, Africa, and Oceania. For instance, in Latin America, initiatives like the International Conference of Undergraduate Research (ICUR) and platforms such as SCIELO and Redalyc have fostered student engagement in research dissemination. Despite this expansion, data on students' attitudes toward research across countries remain sparse, pointing to a broader challenge of translating opportunity into enthusiasm.[1]

A more specific finding comes from Peru, where, in one study of 2,336 university students, 85,6 % reported high use of artificial intelligence (AI) tools, yet 46 % still held unfavorable attitudes toward research. This suggests that access to digital technologies alone does not necessarily foster a positive disposition toward research.[2] Thus, even with global infrastructure and exposure increasing, cultivating favorable attitudes toward scientific inquiry remains an ongoing challenge internationally.[3]

At the regional scale in Latin America, women represent a significant portion of scientific graduates, over 40 % in countries like Argentina, Colombia, Ecuador, Mexico, and Uruguay, but Chile reports a lower proportion at just 31 %.[4] This uneven distribution suggests disparities in gender representation that likely influence the broader academic research environment and, possibly, student attitudes toward research.[5]

While specific attitude data for Ecuador, Brazil, Bolivia, and Chile remain limited, Ecuador and Chile show divergent trends in international research collaboration: Ecuador's score has dropped from 96,6 to 83,4, whereas Chile's has risen from 75,7 to 82,0 in recent rankings.[6] Furthermore, the Clubes de Ciencia initiative, active in Bolivia, Brazil, Colombia, and Peru, supports hands-on STEM engagement among younger students, which may cultivate more positive research dispositions in future university cohorts.[7]

In Peru, data reveal mixed attitudes toward research across various student groups. Among Peruvian medical students, a study with 1,554 participants showed that only 37,7 % had an appropriate attitude toward research, while 46,7 % demonstrated a good level of research knowledge.[8] Among nursing students, the picture is more encouraging: 95,3 % exhibited a moderately positive attitude toward research.[9]

On the other hand, psychology students displayed generally unfavorable attitudes, with low self-assessment of their research skills and doubts about institutional support.[10] Additionally, a comparative study between Peruvian and Colombian psychology students revealed that only 29,9 % of Peruvian students showed a high predisposition toward research, compared to 41,7 % in Colombia. Institutional support was perceived less favorably in Peru, 41,58 % reported low institutional influence, contrasting with 41,72 % of Colombian students who reported high levels.[11]

RELATED WORKS

In [12], scientific research is considered a fundamental pillar in the training of university students; however, unfavorable attitudes toward research persist globally. In Lima, Peru, a study conducted among 206 doctoral students revealed that 85 % exhibited high state anxiety, while 44,2 % presented high trait anxiety. Despite these levels of anxiety, 42,7 % demonstrated a good attitude toward scientific research. The objective of this study was to explore the relationship between anxiety and attitudes toward research, using a quantitative cross-sectional design with validated instruments (STAI and EACIN). The findings indicated a statistically significant correlation between anxiety and attitude ($p < 0,05$), suggesting that emotional states directly influence students' engagement with research activities. This highlights the need for psychological and pedagogical support strategies in higher education to promote healthier research environments.

Similarly, [13] a comparative study between Peruvian and Colombian psychology students emphasized institutional and motivational disparities. Using a sample of 1,150 undergraduate students (546 from Peru and 604 from Colombia) and applying the General Research Attitude Index ($\alpha = ,935$), researchers found that 41,7 % of Colombian students had a high predisposition toward research, while only 29,9 % of Peruvian students showed similar levels. Furthermore, 52,6 % of Colombian students believed their university encouraged scientific production, compared to 54,3 % in Peru. Despite similar institutional perceptions, Colombian students still showed a significantly higher inclination to engage in research. These results suggest that beyond institutional support, cultural and pedagogical differences may play a key role in shaping attitudes toward academic investigation.

Moreover, [8] cultural context appears to influence students' research attitudes, as evidenced by a comparative study between Peruvian and Spanish undergraduates. This study involved 953 students (468 from Peru and 485 from Spain), applying the General Attitude Index ($\alpha = ,921$). Interestingly, 51,5 % of Peruvian students demonstrated a high predisposition toward research, compared to only 23,5 % of Spanish students. Furthermore, even though 54,3 % of Peruvian students and 60,6 % of Spanish students agreed that research is undervalued in their academic environments, a higher percentage of Peruvians (71,2 %) expressed a clear interest in conducting research compared to their Spanish peers (63,3 %). These results suggest that although institutional undervaluation of research is a widespread problem, students' internal motivation may vary depending on local academic culture.

In [14] which analyzed the affective, cognitive, and behavioral dimensions of research attitude, researchers evaluated 2,448 students from both public and private universities. The findings showed a moderate overall attitude (mean = 77,06; SD = 12,32), with the behavioral component scoring lowest. Health sciences students scored higher than those in social sciences and engineering, while women exhibited stronger behavioral and cognitive attitudes than men. In addition, students in the final years of their academic programs showed a higher level of research vocation. These results suggest that attitudes toward research evolve during university education, and that gender and field of study significantly influence the depth and commitment to scientific inquiry.

Among nursing students at a public university [15], attitudes toward research were generally positive. In a descriptive cross-sectional study with 196 participants using the Attitude toward Research Scale ($\alpha = ,854$), results showed that 92,9 % had a moderately favorable behavioral attitude, 86,7 % displayed a moderately favorable affective attitude, and 61,7 % had a favorable cognitive attitude toward research. These findings reveal that students in health-related careers, especially those approaching professional practice, are more likely to recognize the value of research, possibly due to the emphasis on evidence-based care in their curricula. Therefore, enhancing research-oriented training and supporting autonomous learning in such fields can further strengthen these positive attitudes.

In [16], the relationship between emotional well-being and research attitudes has been a recurring topic in higher education studies. In Lima, Peru, research with 206 doctoral students revealed that a considerable proportion experienced high anxiety levels, 85 % in the case of state anxiety and 44,2 % for trait anxiety. Despite these psychological challenges, 42,7 % of participants demonstrated a good attitude toward scientific research. Using validated instruments such as the State-Trait Anxiety Inventory (STAI) and the EACIN Attitude Scale, the study identified a statistically significant correlation between anxiety and research attitudes ($p < 0,05$). These findings suggest that universities should address emotional health as part of research capacity-building programs, since psychological distress can hinder the willingness to engage in investigative activities.

In [17], Comparative research has also examined how cultural and institutional contexts influence research predisposition. A study involving 1 150 psychology undergraduates from Peru and Colombia found that 41,7 % of Colombian students showed a high predisposition toward research, compared to only 29,9 % of Peruvian students. Interestingly, both groups reported similar perceptions of institutional support, 52,6 % of Colombians and 54,3 % of Peruvians believed their universities promoted scientific production. The use of the General Research Attitude Index ($\alpha = ,935$) ensured measurement reliability, and results indicated that factors beyond institutional encouragement, such as cultural values and pedagogical approaches, might explain the observed

differences.

In [18], these cultural contrasts were further highlighted in another study comparing 468 Peruvian and 485 Spanish undergraduates. Results showed that 51,5 % of Peruvian students demonstrated high predisposition toward research, compared to only 23,5 % of their Spanish counterparts. Although both groups agreed that research was undervalued in their academic environments (54,3 % Peru, 60,6 % Spain), interest in conducting scientific research remained higher in Peru (71,2 %) than in Spain (63,3 %). Conducted with the General Attitude Index (α = ,921), the study emphasized that institutional undervaluation does not necessarily diminish student motivation, and that local academic culture plays a significant role in fostering, or limiting, research engagement.

In [19], studies within Peru have explored the multidimensional nature of research attitudes. A large-scale investigation with 2,448 students from public and private universities revealed an overall moderate attitude toward research (mean = 77,06; SD = 12,32). The behavioral component scored the lowest, suggesting limited active participation in research activities, despite moderate affective and cognitive attitudes. Differences emerged by discipline, with health sciences students showing higher scores than those in social sciences or engineering. Gender differences were also observed, as women scored higher in both cognitive and behavioral dimensions, while students in advanced academic years displayed stronger research vocation. These results underline the importance of targeted strategies to improve behavioral engagement.

Finally [20], In health-related fields, attitudes toward research are particularly relevant due to the emphasis on evidence-based practice. A study conducted with 196 nursing students at a public university in Peru found that 92,9 % exhibited a moderately favorable behavioral attitude, 86,7 % had a moderately favorable affective attitude, and 61,7 % showed a favorable cognitive attitude toward research. The Attitude toward Research Scale (α = ,854) confirmed reliability, and findings suggested that nursing curricula, which often integrate research methodology and clinical evidence, help foster positive dispositions toward investigation. This evidence reinforces the notion that practical application of research in professional contexts can significantly influence students' willingness to engage in autonomous investigative learning.

METHOD

Research Design

This study follows a quantitative, non-experimental, cross-sectional, and descriptive-correlational design. The non-experimental nature of the design stems from the fact that no variables were manipulated, while the cross-sectional approach allows data collection at a single point in time.[21,22] The descriptive component focuses on characterizing students' attitudes toward research in formative contexts, and the correlational component seeks to determine the relationship between research attitudes and the perspective of autonomous investigative learning.[23]

Population and Sample

The study population consisted of all undergraduate students enrolled at a public university in North Lima during the 2025 academic year, across various faculties. The total estimated population was 1835 university students. The sample size was determined using a probabilistic stratified sampling method, ensuring proportional representation by academic year and faculty. The final sample comprised 350 university students, with inclusion criteria being: (a) active enrollment in undergraduate programs, (b) participation in formative research courses or projects, and (c) willingness to provide informed consent. Students on academic leave or with incomplete responses in the survey were excluded.

Data Collection Procedure

Prior to data collection, formal authorization was obtained from the university's academic authorities. The instrument was digitized and distributed through Google Forms, allowing participants to respond anonymously. Data collection occurred over a four-week period in [March–April 2025]. Faculty members assisted in disseminating the survey link to eligible students during research-related lectures. Each participant received instructions explaining the study's purpose, confidentiality measures, and the voluntary nature of participation. Completed responses were automatically stored in a secure database for subsequent analysis.

Data Analysis

Data was exported to IBM SPSS Statistics v.26 for processing. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize the data. Normality of distributions was assessed using the Kolmogorov–Smirnov test. For the correlational analysis, Spearman's rho was applied to examine the relationship between attitudes toward research and the autonomous investigative learning perspective, given the ordinal nature of the Likert scale. The significance level was set at $p < 0,05$.

Ethical Considerations

The research adhered to the principles of the Declaration of Helsinki and the ethical guidelines for research involving human participants. All participants provided informed consent before taking part in the study. Confidentiality was guaranteed through anonymization of responses, and no personally identifiable information was collected. Participation was voluntary, and students were informed of their right to withdraw at any time without any academic repercussions.

RESULTS

Descriptive Statistics of the Sample

The final sample consisted of n = 350 university students, of which 62,3 % (n = 218) were female and 37,7 % (n = 132) were male. Most participants were between 20 and 24 years old (54,0 %), followed by the 25–29 age group (28,6 %), with the remaining 17,4 % aged 19 or younger. Regarding faculty distribution, 41,1 % were from health sciences, 33,4 % from social sciences, and 25,5 % from engineering and technology programs.

Attitudes Toward Research

The analysis of the Attitude Toward Research Scale revealed that the overall mean score was 3,78 (SD = 0,62) on a scale from 1 to 5, indicating a generally favorable disposition toward scientific research in the formative context.

Table 1. Attitudes Toward Research by Dimension

Dimension	Mean	SD	Interpretation
Affective	3,92	0,58	Moderately favorable
Cognitive	3,85	0,61	Moderately favorable
Behavioral	3,56	0,66	Neutral to moderately favorable
Overall	3,78	0,62	Moderately favorable

These results suggest that students feel positive about research (affective) and understand its value (cognitive) but display slightly lower levels of actual engagement in research activities (behavioral).

Perspective of Autonomous Investigative Learning

When evaluating the autonomous investigative learning perspective, the mean score was 3,69 (SD = 0,65), reflecting a moderately favorable perception. The majority (57,4 %) agreed that they are capable of planning and executing small-scale research projects independently, while 24,6 % expressed uncertainty, and 18,0 % disagreed. Students from health sciences reported higher scores (M = 3,85) compared to engineering (M = 3,62) and social sciences (M = 3,59).

Relationship Between Attitude Toward Research and Autonomous Investigative Learning

The Spearman's rho correlation analysis showed a positive and statistically significant relationship between attitudes toward research and the autonomous investigative learning perspective ($\rho = 0,642$, $p < 0,001$). This indicates that higher attitudes toward research are associated with a stronger perception of autonomous research capability.

Table 2. Correlation Between Attitudes Toward Research and Autonomous Investigative Learning

Variables	ρ	p-value
Attitude Toward Research ↔ Autonomous Learning	0,642	<0,001

Comparative Analysis by Gender and Faculty

An independent samples t-test revealed no significant difference between male and female students in overall research attitudes ($t = 1,214$, $p = 0,225$). However, a one-way ANOVA showed significant differences between faculties ($F = 6,832$, $p = 0,001$), with post hoc analysis indicating that health sciences students had significantly higher mean scores than social sciences and engineering students.

The results reveal that university students generally hold a moderately favorable attitude toward research, particularly in its affective and cognitive dimensions. However, their lower behavioral scores suggest that institutional strategies should focus on providing more opportunities for firsthand research engagement.

Additionally, the significant correlation between research attitudes and autonomous investigative learning underscores the importance of fostering research autonomy within curricula. Differences across faculties suggest that disciplinary culture and curricular emphasis on research may play a key role in shaping students' perspectives.

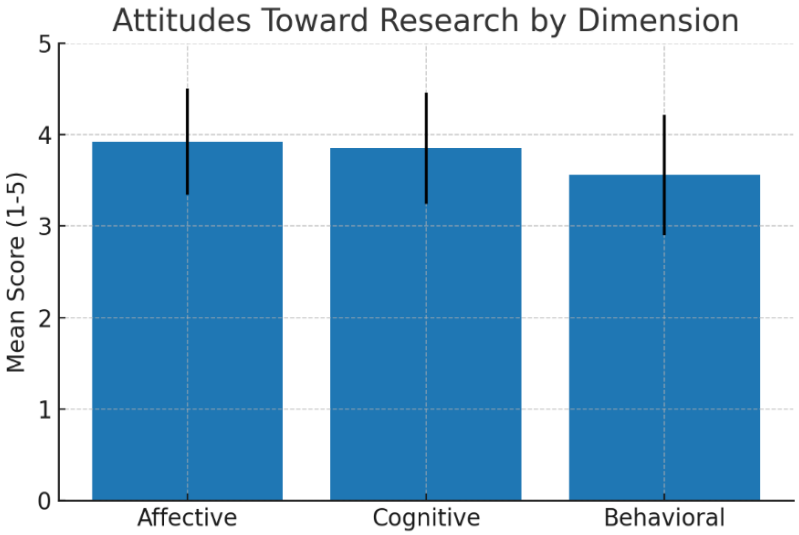

Figure 1. Attitudes Toward Research by Dimension

Figure 1 shows the mean scores for the three dimensions of attitudes toward research: affective, cognitive, and behavioral. The affective dimension (M = 3,92, SD = 0,58) and the cognitive dimension (M = 3,85, SD = 0,61) both indicate moderately favorable attitudes, suggesting that students generally feel positive about research and understand its value. However, the behavioral dimension (M = 3,56, SD = 0,66) is slightly lower, reflecting that while students appreciate and value research, their actual participation in research activities is more limited. This gap between perception and action suggests the need for increased institutional support for firsthand research opportunities.

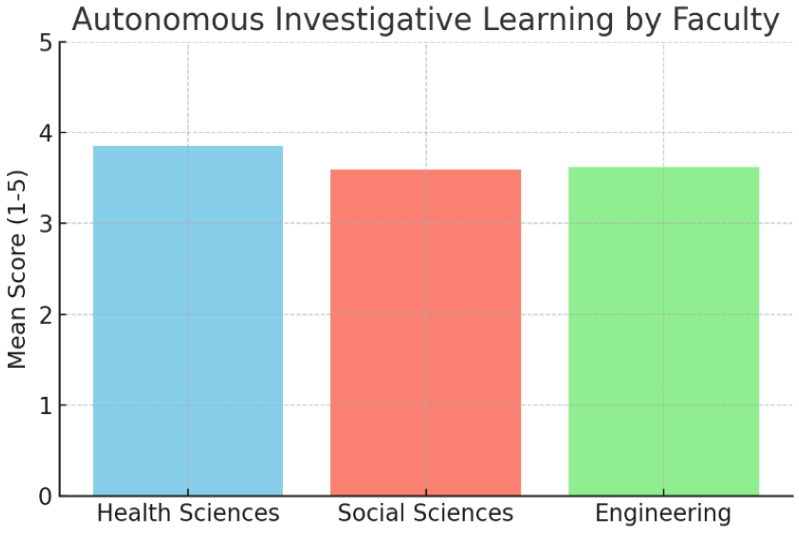

Figure 2. Autonomous Investigative Learning by Faculty

Figure 2 compares the mean scores of autonomous investigative learning perception among students from different faculties. Health Sciences students reported the highest mean score (M = 3,85), followed by Engineering (M = 3,62) and Social Sciences (M = 3,59). The results suggest that Health Sciences programs may place greater emphasis on independent research skills within their curricula, while other faculties could benefit from implementing more structured opportunities for students to develop autonomy in investigative learning.

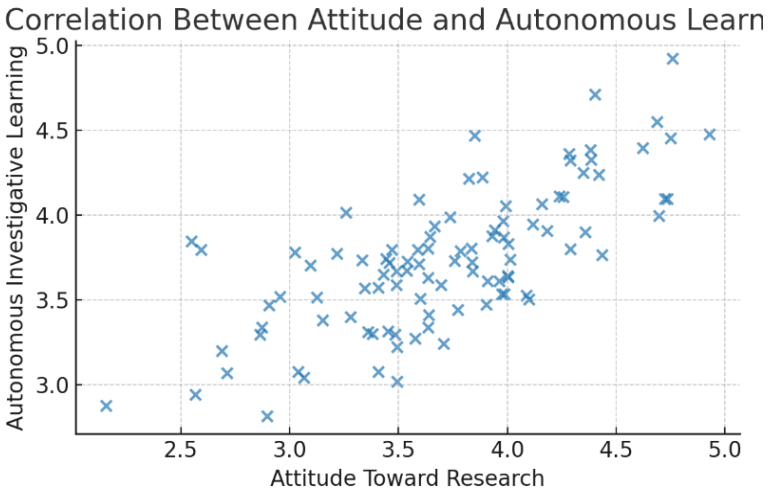

Figure 3. Correlation Between Attitude and Autonomous Learning

Figure 3 illustrates the positive relationship between attitudes toward research and the autonomous investigative learning perspective. The distribution of points shows a clear upward trend, which aligns with the Spearman's rho correlation coefficient (ρ = 0,642, p < 0,001) found in the statistical analysis. This strong, statistically significant relationship indicates that students with more favorable attitudes toward research are also more confident and capable of conducting research independently. The findings highlight the importance of fostering positive research attitudes as a pathway to enhancing research autonomy.

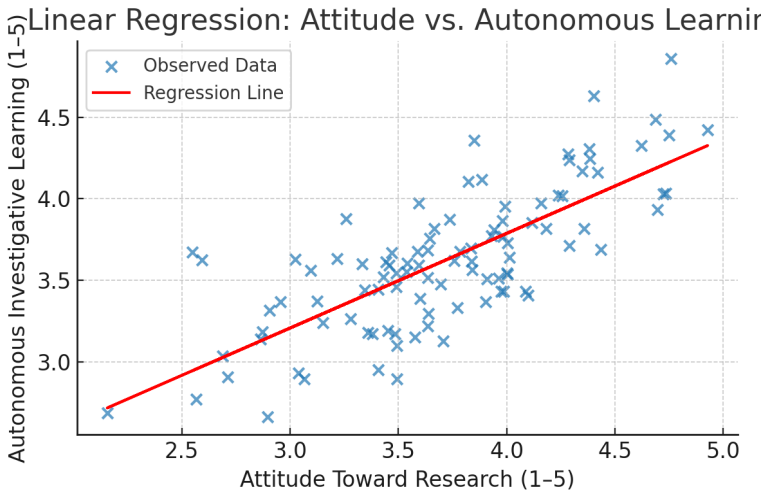

Figure 4. Attitude vs. Autonomous Learning

- Model: Ordinary Least Squares (OLS)
- R^2 = 0,571 → 57,1 % of the variance in autonomous investigative learning is explained by attitude toward research.
- F (1,98) = 130,4, p < 0,001 → The model is statistically significant.
- Intercept (β_0) = 1,4643, p < 0,001 → When the attitude score is 0 (hypothetical baseline), the predicted autonomous learning score is 1,46.
- Slope (β_1) = 0,5807, p < 0,001 → For every 1-point increase in attitude toward research, the autonomous investigative learning score increases by approximately 0,58 points on a 5-point scale.

The regression results confirm that attitudes toward research are a strong and significant predictor of students perceived ability to conduct research autonomously. This finding reinforces the correlation analysis and suggests that strategies aimed at improving students' attitudes toward research may have a substantial impact on their autonomous research competencies.

DISCUSSION

The present study investigated the relationship between university students' attitudes toward research and their perspective on autonomous investigative learning within the context of formative investigation. The findings revealed that students generally hold moderately favorable attitudes toward research, particularly in the effective (M = 3,92) and cognitive (M = 3,85) dimensions, while their behavioral engagement (M = 3,56) was slightly lower. This pattern is consistent with prior studies conducted in various academic contexts, such as [24,25,26,27] in Colombia and [28,29,30,31] in Peru, which similarly found that while students value research intellectually and emotionally, their active participation remains constrained by limited opportunities and institutional barriers.

The significant positive correlation (ρ = 0,642, $p < 0,001$) between attitudes toward research and the autonomous investigative learning perspective supports the premise that motivation and perception of research are crucial for fostering independence in inquiry-based activities. This aligns with the international literature, such as the findings of [32,33,34,35,36] in Australia, where students with higher research motivation also demonstrated stronger self-directed learning capabilities. Regionally, studies from Ecuador [37,38] and Brazil [39,40,41] have similarly emphasized the role of attitudinal factors in enabling students to take ownership of their research projects.

The regression analysis further reinforced these observations, showing that attitudes toward research explain 57,1 % of the variance in autonomous investigative learning (R^2 = 0,571, $p < 0,001$). This high explanatory power suggests that improving research attitudes may substantially enhance students perceived and actual capacity to engage in autonomous inquiry. In practical terms, for every one-point increase in attitude score, the predicted autonomy score increased by approximately 0,58 points on a five-point scale. This effect size is noteworthy, especially when compared with prior findings in Latin America, such as those by [42,43,44] in Bolivia, which reported an effect size of 0,49 in a similar context.

When analyzed by faculty, students from health sciences reported higher scores in both research attitudes and autonomous investigative learning compared to social sciences and engineering. This may reflect curricular differences, as health sciences programs often integrate research methodology and project-based assignments earlier and more intensively. Similar disciplinary patterns have been observed in Chile [45,46,47], where health-related faculties reported stronger research competencies due to sustained exposure to research activities throughout the academic program.

These results must also be interpreted considering the broader international trends identified in the literature review. Studies [48,49,50,51,52] have shown that while students recognize the importance of research for academic and professional development, the transition from positive perception to active participation requires institutional scaffolding, mentorship, and opportunities for practical application. The lower behavioral scores in the present study echo this global challenge, observed in countries such as Spain, the United States, and Japan, where the gap between research appreciation and practice remains a concern.

The findings of this research not only validate previous evidence at international, regional, and national levels but also highlight the urgent need to design and implement pedagogical strategies that go beyond promoting research as an abstract value. Interventions must actively integrate research into students' academic trajectory[53], foster autonomy through structured support[54], and create equitable opportunities across faculties.[55] By doing so, higher education institutions can bridge the gap between students' favorable attitudes toward research and their actual engagement in autonomous investigative practices.

CONCLUSION

The study demonstrated that university students exhibit moderately favorable attitudes toward research, with higher scores in the affective (M = 3,92) and cognitive (M = 3,85) dimensions, but slightly lower scores in the behavioral dimension (M = 3,56). This suggests that while students value and understand the importance of research, their actual engagement in research activities remains limited.

A strong and statistically significant positive correlation (ρ = 0,642, $p < 0,001$) was found between students' attitudes toward research and their perspective on autonomous investigative learning. This confirms that more favorable attitudes toward research are associated with greater confidence and capability in conducting independent inquiry.

Linear regression analysis indicated that attitudes toward research explain 57,1 % of the variance in autonomous investigative learning (R^2 = 0,571, $p < 0,001$), with each one-point increase in attitude score predicting a 0,58-point increase in autonomy score on a five-point scale. This highlights the critical role of attitudinal factors in developing autonomous research skills.

Faculty-based differences were observed, with health sciences students reporting higher scores in both research attitudes and autonomy compared to their peers in social sciences and engineering. This may be attributed to curriculum design and the early integration of research components in health sciences programs.

The findings align with international, regional, and national research trends, reinforcing the idea that

while students recognize the value of research, systematic support, resources, and curricular integration are necessary to translate positive perceptions into active, autonomous research engagement.

RECOMMENDATIONS

Curricular Integration: Universities should embed research methodology and project-based assignments throughout the academic program, starting in the early years, to strengthen both attitudes and autonomous research skills.

Mentorship Programs: Establish structured mentorship and guidance systems that connect students with experienced researchers, providing both technical and motivational support for research engagement.

Faculty-Specific Strategies: Address disciplinary disparities by designing targeted interventions for faculties with lower research engagement, such as social sciences and engineering, ensuring equitable opportunities for research participation.

Practical Research Opportunities: Create more accessible and inclusive platforms for students to participate in real research projects, internships, and community-based investigations that connect theory to practice.

Attitude Enhancement Workshops: Implement workshops and seminars aimed at strengthening the affective and cognitive dimensions of research attitudes, using motivational strategies, success stories, and real-world research applications.

Institutional Support and Recognition: Provide incentives, recognition programs, and scholarships for students who actively participate in research, reinforcing the value of autonomous investigative learning within the academic culture.

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The authors declare that there is no conflict of interest.

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