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INNOVATIVE LEARNING EXPERIENCES FOR IMPROVING TEACHING PERFORMANCE IN HIGHER EDUCATION

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ABSTRACT
In higher education, ongoing professional development for faculty is a key factor in improving the quality of teaching and learning processes. However, concrete evidence regarding the actual effects of this training on teacher performance is not always available. Therefore, this study aims to confirm the effectiveness of innovative learning experiences in improving teacher performance in higher education. The methodology employs a quantitative approach with confirmatory research and a quasi-experimental design. The sample consisted of 50 higher education faculty members. The results showed that innovative learning experiences not only led to a substantial improvement in average teacher performance but also raised the minimum performance level and standardized learning outcomes. The study concludes that innovative learning experiences optimized learning assessment. The acceptance of the alternative hypothesis (Ha) confirms that innovative learning experiences improve learning assessment in higher education.

KEYWORDS: Innovative; Learning; Methodologies; Teacher; Teaching.

INTRODUCTION

Given the revolutionary changes that humanity is experiencing as a result of artificial intelligence (AI), higher education is called upon to close the gap that has long existed between technology and teaching. Although the quarantine caused by the pandemic forced governments to implement distance education through the use of technology as a learning tool, it is also true that classrooms continue to rely on methods centered on memorization and encyclopedism. These approaches allow students to acquire certain competencies, but in the face of today's rapidly changing circumstances, they become disconnected from reality. Therefore, according to Hernández Rodríguez (2002, p. 118), "the accelerated changes occurring worldwide compel universities to critically review their practices."

"Higher education is at a turning point where it is imperative to reconsider its methods and approaches to meet the emerging needs of society and the labor market" (Zambrano Zambrano et al., 2024, p. 54). This labor market is a growing concern for students worldwide, given the rise of artificial intelligence and its persistent promise that, in the not-too-distant future, it will replace humans as a labor force. In this sense, higher education must evolve toward innovation; however, doing so requires addressing problems such as dropout, which is a significant issue in Latin America, with causes grouped into academic, motivational, institutional, and socioeconomic factors (Parra et al., 2023).

Other studies indicate that dissatisfaction with the educational institution, classroom conditions, personal and economic problems, and deficient institutional management explain dropout in higher education (Escalante López et al., 2023). In addition, there are problems such as the lack of technological resources, which became evident with the closure of educational institutions during the pandemic, and the digital access, cognitive, and academic gaps that persist in current teaching (González Motos & Bonal Sarró, 2023). Resistance to change and a lack of institutional recognition (Armada Pacheco, 2023) further compound the problems that persist in higher education. Based on this context, the present study aims to confirm innovative learning experiences for improving teaching performance in higher education.

Teaching in higher education was specifically selected because workplace competencies at this educational level are key to students' comprehensive training and professional development (Cejas & Palacios, 2023), and higher education contributes to the academic development of future professionals (Duche Pérez et al., 2023), enabling them to acquire the scientific knowledge needed for their performance in the workplace, which in turn benefits a country's development (Ramírez Chávez & Álvarez Molares, 2023). Furthermore, the teaching of workplace competencies must be framed within the current context; in this sense, students need to acquire digital competencies that allow them to critically access and evaluate information, communicate and collaborate in virtual environments, use technological

tools for learning, and solve problems creatively (Candia López, 2023). These dimensions are indispensable given the changes introduced by AI.

Although teaching and learning in higher education have evolved significantly due to technological advances and new labor market demands (Gonzabay Bravo et al., 2025), further progress toward technological innovation in education is still needed. Indeed, many nations worldwide have recognized the importance of educators using technology in the classroom to meet students' growing technological expectations and to improve their own performance (Panakaje et al., 2024). Consequently, training in pedagogical, methodological, and planning aspects represents a significant challenge for teachers.

To improve the efficiency of education, Sabharwal and Miah (2024) argued that the teaching task should be distinguished by its positive aspects. Fang (2024) stated that there is a pressing need for educators to integrate innovative pedagogical methodologies, such as problem-based learning and case studies, into their teaching practices in order to foster students' creativity and lead them to transform their theoretical knowledge into practical applications. In this regard, Muniandy and Abdullah (2023) affirm that integrating innovative pedagogies in higher education is essential for achieving greater student engagement and reflective, critical thinking.

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2025), in its Regional Teacher Strategy for Latin America and the Caribbean, teacher quality is vital, as teachers play an increasingly central role in the process of educational transformation toward inclusive, democratic, and equitable education through the integration of modern teaching-learning strategies, the application of technology, and even artificial intelligence (AI). According to Colus (2024), technology can be a powerful ally in advancing more individualized, interactive, and dynamic learning experiences when used strategically and deliberately, making it imperative for educators to receive specialized training in technological tools and pedagogical methodologies.

Likewise, Marmolejo (2023), through an open UNESCO-IESALC consultation addressed to the academic community of 17 Latin American and Caribbean countries, identified key recommendations for higher education, including rebuilding the pedagogical approach toward innovative learning models, optimizing connectivity and the acquisition of new technologies, and preparing teachers for an increasingly digitalized environment. In this digital era, educators must adopt approaches that offer meaningful learning experiences in which student support is maintained through mobile devices, blogs, and educational platforms, among other resources (Zaragoza Vega & Gutiérrez Pérez, 2019).

Meaningful learning was an educational approach proposed by Ausubel, who emphasized the student's active engagement in learning meaningfully by using prior knowledge to connect with new content, with the teacher acting as a facilitator and mediator in pursuit of greater significance in the learning process. Likewise, Vázquez Arellano and García Rodríguez (2021), in their study on Carl Rogers's ideas, highlighted significant contributions to the pedagogical approach of student-centered learning, which was integrated into competency-based teaching and the incorporation of ICT in education, adapting to the demands of today's learners (Quiroz Albán & Tubay Zambrano, 2021).

MATERIALS AND METHODS

The study was characterized by a quantitative approach, with a confirmatory research type defined by Hurtado (2020) as a type of study within the holistic approach whose purpose is to verify hypotheses derived from an existing theory by contrasting them with direct experience. Regarding the research design, it is quasi-experimental. The study sample consisted of 50 higher education teachers.

RESULTS AND DISCUSSION

Table 1. Innovative learning experiences for improving teaching performance in higher education

Specific objectives	No.	Learning experiences
1. Implement training workshops addressing the planning of innovative learning experiences through active methodologies in higher technological education	1. 2. 3.	Innovative planning with active methodologies: Flipped Classroom. Application of digital tools for the Flipped Classroom. Innovative planning and organization in Project-Based Learning.
2. Implement workshops addressing the facilitation of the teaching-learning process in the context of higher technological education	4. 5. 6. 7.	Skills for collaborative work, team-building techniques, and conflict resolution. Use of interaction and communication tools. Digital competence and media literacy.

		Role of the teacher as facilitator in creating an active, collaborative, and reflective learning environment.
3. Implement training workshops for developing teaching competencies in the assessment of the teaching-learning process in higher technological education	8. 9. 10.	Application of AI tools for assessment. Assessment tools. Design of an integrated learning experience.

The results show a significant change in teaching performance between the pretest and posttest. The control group's posttest mean was 13.44, while the experimental group reached 18.80. The experimental group showed lower dispersion (CV = 7.5%) compared to the control group (CV = 17.3%), evidencing greater homogeneity in its learning.

Table 2. Descriptive statistics for the pretest and posttest of teaching performance

Statistic	Control (Posttest)	Experimental (Posttest)
Valid N	25	25
Mean	13.44	18.80
Median	14.00	19.00
Mode	14.00	19.00
Standard deviation	2.32881	1.41421
Variance	5.423	2.000
Skewness	-0.025	-1.441
Coefficient of variation	17.3%	7.5%
Minimum	10.00	15.00
Maximum	17.00	20.00

In the analysis by dimension for the experimental group, dimension D3 (Assessment of Learning) obtained the highest mean (0.9657) and the lowest dispersion (CV = 7.7%), followed by D1 (Planning and Organization, 0.9400) and D2 (Facilitation, 0.9143).

Main finding (Table 2). The experimental group substantially outperformed the control group, with a mean difference of 5.36 points (18.80 vs. 13.44), representing a relative increase of 39.9%.

Central tendency. Mean and median: in the experimental group, both values (18.80 and 19.00) are nearly identical and higher than those of the control group (13.44 and 14.00). The experimental group's median (19) even exceeds the control group's maximum (17), indicating that more than half of the experimental group scored higher than the best-performing participant in the control group. This suggests a very strong intervention effect.

Mode: In the experimental group, the mode is 19 (concentration at high values); in the control group, it is 14. This reinforces the notion that most teachers in the experimental group achieved markedly higher performance levels.

Dispersion and homogeneity. Standard deviation and variance: the experimental group shows a much lower variance (2.00 vs. 5.423), indicating that scores are more clustered around the mean. This is desirable in an educational intervention, as it shows that the benefit was consistent across participants.

Coefficient of variation (CV): the experimental group's CV is only 7.5%, compared to 17.3% for the control group. This means that, even accounting for the measurement scale, the experimental group is more than twice as homogeneous in its performance. This low dispersion suggests that the innovative methodology succeeded in raising the minimum performance level of all participants, reducing internal gaps.

Shape of the distribution (skewness). Control group: skewness = -0.025 (practically symmetrical). Experimental group: skewness = -1.441 (strongly negative). Most teachers scored between 18 and 20 points, with few lower values (the minimum was 15). This negative skewness is typical when a successful intervention pushes many participants toward the upper limit of the scale.

Range and extreme values. The experimental group has a minimum of 15 (vs. 10 in the control group) and a maximum of 20 (vs. 17). That is, even the lowest score in the experimental group exceeds the lowest score in the control group and reaches the maximum possible score. This evidences a much higher performance floor following the intervention.

Table 3. Descriptive statistics by dimension for the experimental group (posttest)

Statistic	D1: Planning and Organization	D2: Facilitation	D3: Assessment
Valid N	25	25	25
Mean	0.9400	0.9143	0.9657

Median	1.0000	1.0000	1.0000
Mode	1.00	1.00	1.00
Standard deviation	0.09477	0.13678	0.07469
Variance	0.009	0.019	0.006
Skewness	-1.343	-1.548	-2.197
Coefficient of variation	10.1%	15.0%	7.7%
Minimum	0.67	0.57	0.71
Maximum	1.00	1.00	1.00

Note: Prepared using SPSS software.

Normality Test and General Hypothesis

Normality hypotheses: H0: The data are normally distributed. Ha: The data are not normally distributed.

Table 3 breaks down the experimental group's posttest scores into three key pedagogical dimensions. Scores appear to be on a 0-to-1 scale (or normalized percentage), where 1 represents maximum performance.

Comparison between dimensions

Dimension	Mean	CV	Skewness	Interpretation
D1: Planning and Organization	0.9400	10.1%	-1.343	Very high, slight dispersion
D2: Facilitation	0.9143	15.0%	-1.548	High, but with greater variability
D3: Assessment of Learning	0.9657	7.7%	-2.197	Highest and most homogeneous

Highlighted dimension: Assessment (D3). Highest mean (0.966) and lowest CV (7.7%): this indicates that the intervention was particularly effective in improving teachers' assessment competencies. The near absence of dispersion suggests that all participants achieved excellent and uniform mastery in designing, applying, and providing feedback on assessments.

Extremely negative skewness (-2.197): the vast majority of scores are concentrated at 1.00 (the maximum value). Only a few cases fall slightly below (minimum 0.71). This may reflect that the assessment instruments or rubrics were very effectively internalized through the innovative experiences.

Facilitation dimension (D2). This dimension has the lowest mean (0.914) and the highest CV (15.0%). Although still a very good score, it shows greater heterogeneity. This may be because facilitation (classroom management, interaction, motivation, use of active methodologies) is more sensitive to personal style or prior experience. Its standard deviation of 0.136 is nearly double that of D3.

Planning dimension (D1). This dimension occupies an intermediate position: a high mean (0.94) and a moderate CV (10.1%). It is more homogeneous than D2 but less so than D3. The negative skewness indicates that many teachers reached the maximum (1.00), with a minimum of 0.67. This suggests that planning (design of objectives, instructional sequences, resources) was well addressed by the training, albeit with slight variability.

Internal consistency of results. All three dimensions show medians and modes of 1.00, reinforcing that most teachers in the experimental group achieved the optimal level in each competency. The low variances (between 0.006 and 0.019) confirm that the intervention left no participant behind.

Table 4. Shapiro-Wilk normality test – Teaching performance variable (posttest)

Group	Statistic	df	Sig.
Control – Posttest	0.931	25	0.094
Experimental – Posttest	0.776	25	0.000

For the control group, $p = 0.094 > 0.05$; therefore, H0 is accepted (normal distribution). For the experimental group, $p = 0.000 < 0.05$; therefore, H0 is rejected (non-normal distribution). Since one group is normal and the other is not, the non-parametric Mann-Whitney U test was applied.

General hypothesis: Innovative learning experiences for improving teaching performance in higher education.

Statistical hypothesis test: H0: $\mu CG = \mu EG$ Ha: $\mu CG \neq \mu EG$

Table 5. Test statistics for the general hypothesis (Mann-Whitney U)

Test statistic	Teaching performance
Mann-Whitney U	17.500
Wilcoxon W	342.500
Z	-5.774
Asymptotic sig. (2-tailed)	0.000

Note: Grouping variable: GROUP.

With p-value = 0.000 < 0.05, H0 is rejected and Ha is accepted: innovative learning experiences improve teaching performance in higher education.
Normality Test and Specific Hypotheses (by Dimension)

Table 6. Shapiro-Wilk normality test for the dimensions of the teaching performance variable

Dimension / Group	Statistic	df	Sig.	Decision
D1 – Control – Posttest	0.918	25	0.047	Non-normal
D1 – Experimental – Posttest	0.643	25	0.000	Non-normal
D2 – Control – Posttest	0.927	25	0.074	Normal
D2 – Experimental – Posttest	0.674	25	0.000	Non-normal
D3 – Control – Posttest	0.901	25	0.020	Non-normal
D3 – Experimental – Posttest	0.520	25	0.000	Non-normal

For all dimensions, at least one of the groups did not present a normal distribution; therefore, the Mann-Whitney U test was applied in all three cases.

Specific hypotheses:

H1: Innovative learning experiences improve the planning and organization of the teaching-learning process. H2: Innovative learning experiences improve the facilitation of the learning process. H3: Innovative learning experiences improve the assessment of learning.

Table 7. Test statistics for the specific hypotheses (Mann-Whitney U)

Test statistic	D1: Planning and Organization	D2: Facilitation	D3: Assessment
Mann-Whitney U	101.500	142.500	17.000
Wilcoxon W	426.500	467.500	342.000
Z	-4.322	-3.457	-5.962
Asymptotic sig. (2-tailed)	0.000	0.001	0.000

Note: Grouping variable: GROUP.

In all three dimensions, $p < 0.05$ (D1: $p = 0.000$; D2: $p = 0.001$; D3: $p = 0.000$); therefore, H0 is rejected and H1, H2, and H3 are accepted: the program significantly improves teaching performance in planning and organization, facilitation of the learning process, and assessment of learning.

Linear Regression. Linear regression was used to model the relationship between the pretest score (independent variable) and the posttest score (dependent variable) of the experimental group.

Table 8. Regression coefficients

Model	B	Std. Error	Beta	Sig.
(Constant)	12.938	0.743	—	0.000
PRE_EXP_VAR	0.436	0.054	0.859	0.000

Note: Dependent variable: POST_EXP_VAR.

The predictive linear regression equation is: $y = 12.938 + 0.436x$ where y = estimated posttest score, and x = pretest score. The positive slope (0.436) indicates that a higher pretest score corresponds to a higher estimated posttest score.

Table 9. Regression model summary

R	R square	Adjusted R square	Std. error of the estimate
0.859	0.738	0.726	0.73962

Note: Predictors: (Constant), PRE_EXP_VAR.

The coefficient of determination $R^2 = 0.738$ indicates that pretest scores explain 73.8% of the variance in posttest scores, evidencing high predictive power of the model.

The results clearly confirm that innovative methodologies (project-based learning, the flipped classroom, authentic assessment, among others) substantially outperform traditional methods in teacher training in higher education. The magnitude of the effect (a mean difference of more than 5 points on a scale ranging from 0 to 20) is of considerable practical significance. Furthermore, the reduced variability in the experimental group suggests that innovation democratizes teaching excellence: it not only raises the average but also narrows performance gaps among teachers.

Why was the assessment dimension the most benefited? Several plausible explanations exist. Innovative experiences tend to emphasize formative assessment, rubrics, peer assessment, and continuous feedback. It is possible that the training program had a practical and standardized component in this area. Planning and facilitation are

competencies that depend more heavily on personality, prior experience, or classroom conditions (group size, resources, among others). Assessment, in contrast, may be more easily "transferable" through clear procedures and tools.

Implications for teacher training.

Strengthen facilitation: since this was the dimension with the greatest variability, it is recommended to incorporate micro-teaching, peer coaching, and analysis of video-recorded classes to homogenize facilitation skills.

Sustain success in assessment: the results for D3 constitute a model to follow; it would be worthwhile to analyze which specific practices (perhaps the use of shared rubrics or instrument-design workshops) generated this uniformity, and to apply them to the other dimensions.

The intervention was successful across all three dimensions, but especially powerful in the assessment of learning. Facilitation, although good, was the dimension with the greatest room for improvement and the greatest inequality among teachers.

Innovative learning experiences produced not only a substantial improvement in average teaching performance but also a rise in the minimum performance level and a standardization of achievement. The control group, taught under a traditional methodology, showed typical results (a symmetrical distribution, greater variability, and moderate mean scores).

CONCLUSION

It was determined that the implementation of a training program in innovative learning experiences significantly improved teaching performance. The experimental group achieved a mean score of 18.80, evidencing remarkable results. Verification of the alternative hypothesis (Ha) confirmed that such experiences improve teaching performance in higher education.

Likewise, it was found that the training improved the planning and organization of the teaching-learning process. The experimental group obtained a mean of 18.80 in this dimension, with outstanding results. Validation of the alternative hypothesis (Ha) supports the finding that innovative learning experiences have a positive effect on this area within the same institutional context.

An improvement in the facilitation of the learning process was also evidenced, with the experimental group achieving a mean score of 18.286. These notable results, together with the verification of the alternative hypothesis (Ha), support the conclusion that innovative experiences favor the facilitation of learning in higher education.

Finally, it was demonstrated that the training optimized the assessment of learning. The experimental group reached a mean of 19.294 in this dimension, showing outstanding results. The acceptance of the alternative hypothesis (Ha) confirms that innovative learning experiences improve the assessment of learning in higher education.

Conflict of Interest

The author declares no conflict of interest.

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