ALTERIDAD
REVISTA DE EDUCACIÓN
p-ISSN:1390-325X / e-ISSN:1390-8642
http://alteridad.ups.edu.ec



january-june 2026
Vol. 21, No. 1, 64-77
https://doi.org/10.17163/alt.v21n1.2026.05

# Universal Design for Learning in the configuration of inclusive practices among university lecturers in Ecuador

## *Diseño Universal para el Aprendizaje en la configuración de prácticas inclusivas del profesorado universitario en Ecuador*

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**Received on:** 2025-09-30 / **Revised on:** 2025-12-23 / **Accepted on:** 2026-01-05 / **Published on:** 2026-01-12

## Abstract

The growing diversity of students in university classrooms is a reality that intensifies year after year. This scenario makes the teaching staff a fundamental agent in promoting truly inclusive education that favours meaningful and quality learning. This study aims to identify the educational practices of teachers at a public university in Ecuador and determine whether they are aligned with the Universal Design for Learning (UDL) framework. A quantitative, descriptive-exploratory study was conducted, using a survey to collect data from a sample of 123 teachers at a public university in Ecuador.The results show that the most established practices are related to curriculum planning, the use of participatory strategies, and the use of virtual environments. However, weaknesses were identified in the diversification of content formats, formative assessment, and the creation of affective spaces and openness to dialogue, suggesting opportunities for improvement in the construction of inclusive environments and in teacher training. Teachers' perceptions of institutional preparedness to address diversity are critical, pointing to the need to strengthen inclusive policies and institutional support. It is concluded that the DUA is an effective framework for guiding educational transformation and that teachers and students should be considered key actors in building more inclusive universities.

Keywords: inclusive education, Universal Design for Learning, higher education, educational strategies, diversity; accessibility.

## Resumen

La creciente diversidad del estudiantado en las aulas universitarias es una realidad que se intensifica año tras año. Este escenario convierte al cuerpo docente en un agente fundamental para promover una educación verdaderamente inclusiva que favorezca aprendizajes significativos y de calidad. El presente estudio pretende identificar las prácticas educativas que realizan los docentes de una universidad pública de Ecuador, y determinar si se alinean con el marco del Diseño Universal para el Aprendizaje (DUA). Se llevó a una investigación cuantitativa, de tipo descriptivo-exploratorio, utilizando para la recogida de datos la encuesta, con una muestra de 123 docentes de una universidad pública de Ecuador. Los resultados muestran que las prácticas más consolidadas se relacionan con la planificación curricular, el uso de estrategias participativas y el aprovechamiento de entornos virtuales. No obstante, se identifican debilidades en la diversificación de formatos de contenido, la evaluación formativa y la creación de espacios afectivos y de apertura al diálogo, lo que sugiere oportunidades de mejora en la construcción de ambientes inclusivos y en la formación docente. La percepción del profesorado sobre la preparación institucional para atender la diversidad es crítica, lo que señala la necesidad de fortalecer las políticas inclusivas y el acompañamiento institucional. Se concluye que el DUA constituye un marco eficaz para orientar la transformación educativa, y que el profesorado y alumnado deben ser considerados actores clave en la construcción de universidades más inclusivas.

Palabras clave: educación inclusiva, Diseño Universal para el Aprendizaje, educación superior, estrategias educativas, diversidad, accesibilidad.

**Suggested citation (APA):** Espada-Chavarria, R. & Aguilera Zamora, W. (2026). Universal Design for Learning in the configuration of inclusive practices among university lecturers in Ecuador. *Alteridad, 21*(1), 64-77. https://doi.org/10.17163/alt.v21n1.2026.05

## 1. Introduction

Although there has been some progress in access to education (Ainscow and Viola, 2023), higher education faces the urgent challenge of transforming itself into a truly inclusive space, capable of responding to the growing diversity of students. The inclusive education model involves embracing diversity to achieve the presence, learning, participation, and success of all (Ainscow and Messiou, 2018) and accepting difference. According to Iniesto and Bossu (2023), this diversity manifests itself in multiple dimensions: ethnic origin, socioeconomic status, age, disability, among others, all of which influence access, participation, and outcomes in academic settings (Ortiz Moya et al., 2025).

In countries such as Ecuador, where access to university for rural and indigenous populations remains limited—only 11.85% of the rural population has access to higher education (Stefos and Chávez, 2023)— structural barriers such as discrimination, lack of resources, and academic dropout continue to reproduce inequalities (Antón, 2020), limiting the participation of diversity (Arias García et al., 2024).

The democratization of universities requires not only expanding access, but also ensuring participation and the achievement of meaningful learning. To this end, it is necessary to promote institutional cultures that value equity and inclusion, reflected in educational policies and practices committed to diversity.

Studies such as that by Odame et al. (2021) identify lack of accessibility as one of the main barriers to access. On the other hand, López-Gavira et al. (2021) identify barriers to participation, such as a lack of adaptation in teaching methodologies and rigidity in the assessment process. In this regard, Varela and Dans (2024) highlight the use of different forms of assessment to cater to student diversity.

To promote the development and implementation of inclusive teaching practices, pedagogical work is required from both teachers and teacher trainers. Authors such as Florian (2014) and Gale et al. (2017) conceive pedagogical work as a set of beliefs, knowledge, designs, and actions on which to build what they call a socially inclusive pedagogy. Rouse (2017) and Sánchez-Díaz et al. (2024) specify these designs and actions in accessible teaching designs and actions that are put into practice for the development of teaching. It can therefore be understood that a pedagogical approach that promotes inclusion is essential for designing educational plans that include accessible methodologies, resources, and assessments.

In this scenario, approaches derived from universal design have been developed, such as Universal Design for Instruction (UDI) or Universal Design for Learning (UDL), which represent a practical educational approach to implementing inclusive and equitable practices in higher education.

In the case of Universal Design for Learning (UDL), it is presented as a theoretical and methodological framework that allows for responding to individual learning needs and adapts to different ways of learning by addressing barriers to learning at their source, facilitating flexible and accessible educational environments (Gordon, 2024).

Universal Design for Learning (UDL), initially developed by the Center for Applied Special Technology (CAST) in the 1990s and which has evolved to version 3.0, is aligned with inclusive education and provides a framework for action to guide educational practice that reduces barriers and promotes inclusive learning processes. UDL is articulated through three fundamental principles, each of which identifies guidelines and considerations (CAST, 2024) that can also be supported by the use of technological educational resources. These principles represent multiple means of engagement, multiple means of representation, and multiple forms of action and expression that, when combined, allow the curriculum to be designed with student diversity in mind from the outset (Barrera et al., 2025). This involves designing a curriculum that is flexible in terms of opportunities for students, taking into account both motivational aspects and the ways in which information is accessed and understood or knowledge can be expressed (González-Ramírez et al., 2025). Furthermore, in its latest version, it promotes collaboration between teachers and students in the application of its principles and introduces innovative elements such as "fostering empathy," "promoting joy and play," and "recognizing multiple forms of knowledge," which enrich pedagogical practice and make it more humane.

In the university setting, its implementation has demonstrated concrete benefits: improved aca-

demic performance (Casebolt and Humphrey, 2023), greater interaction with materials (Espada-Chavarria et al., 2023; Reyes et al., 2022), increases motivation and reduces dropout rates (Garrad and Nolan, 2023), improves participation (Barrera and Moliner, 2023), student self-reflection (Thoma et al., 2023), and completion of studies (Healy et al., 2023).

However, its practical implementation requires adequate teacher training to overcome barriers and ensure its application in the classroom (Moriña et al., 2025). As indicated by Hromalik et al. (2024), teachers find its application in the classroom complex and, according to Barrera and Moliner (2023), they do not feel prepared to apply it in the classroom. However, in studies similar to the one presented here, it has been observed that teachers who were unaware that they were designing and implementing their study programs based on UDL were, in practice, compatible with its principles (Carballo et al., 2024), becoming aware that they had already applied this type of strategy before their training (Azam et al., 2021). Similarly, Díaz-Vega et al. (2020) observed the same situation when identifying teaching practices with UDI-based programs.

In this scenario, it is essential to rethink curriculum design and pedagogical strategies in light of student diversity. The incorporation of accessible materials and resources, educational technologies, and flexible assessment systems not only facilitates access but also promotes meaningful learning. Universities must commit to transforming their structures and practices, recognizing that all students can learn and that their characteristics, interests, and needs are unique (UNESCO, 2025).

The public university in Ecuador, the subject of this study, has begun an institutional review process aimed at improving its levels of inclusion. This research is part of that process, with the objective of determining whether university teachers apply inclusive teaching practices based on the principles of UDL in their classrooms. The specific objectives are to analyze: a) the actions used in the planning and presentation of the study program, b) the use of accessible resources and materials, c) the use of various forms of assessment and feedback, d) the application of teaching techniques that promote participation and meaningful learning, and e) the use of virtual spaces for learning.

## 2. Methodology

### 2.1 Methodological design

A quantitative research study was conducted, adopting a descriptive-exploratory, non-experimental design, using a survey as a tool (Bisquerra, 2004).

### 2.2 Participants

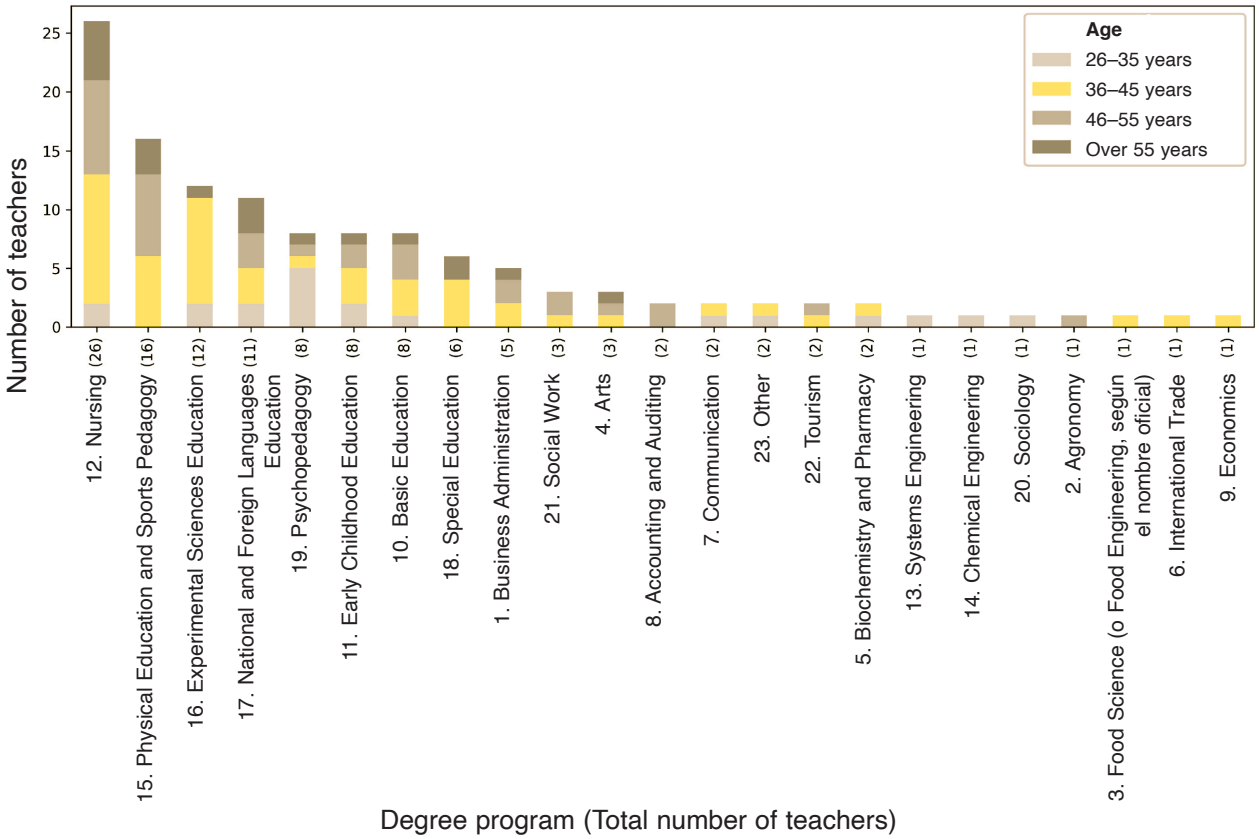
The sample for this study consisted of 123 teachers from a public university in Ecuador, selected through non-probabilistic convenience sampling based on their accessibility and availability during the data collection period. All participants were actively involved in university teaching in one of the institution's faculties.

According to institutional records, a total of 520 teachers were identified during the survey period. For the statistical analysis, a confidence level of 95% was established, and the margin of error corresponding to the population segment under study was calculated, obtaining a value of 7.73%. Given the exploratory nature of the study, this margin is considered methodologically acceptable, as it falls within the commonly accepted range of 5% to 10% for preliminary research, which allows for greater statistical flexibility (Hernández Sampieri et al., 2014).

Teachers from 23 degree programs participated. In terms of the distribution by degree program in which they teach, the most represented were Nursing (21.1%), Physical Activity and Sports Education (13.0%), Experimental Sciences Education (9.8%), and National and Foreign Language Education (8.9%). Teachers were also registered in programs such as Basic and Early Childhood Education (6.5% each), Psychopedagogy (6.5%), Clinical Psychology (4.9%), and Business Administration (4.1%), among others. Regarding gender, 62.3% of participants identified as female and 37.7% as male. One case (0.8%) preferred to omit the answer. In terms of age, most teachers were in the 36-45 age range (41.5%), followed by the 46-55 age group (27.6%). The 26 to 35 and over 55 age groups each represented 15.4% of the sample. This distribution suggests a predominantly adult teaching population, with a significant proportion in the middle stages of their professional careers. In terms of teaching status, the category of non-tenured occasional teacher predominated

(67.5%), followed by tenured associate teacher 1 (10.6%) and tenured assistant teacher 1 (8.9%). Other categories were also identified, such as tenured principal teacher, honorary teacher, guest teacher, and other contractual forms. Finally, in terms of teaching experience, 26.8% of participants had between 7 and 10 years of experience, followed by 22.0% with 4 to 6 years, and 15.4% with 10 to 15 years. Eight point one percent indicated that they had more than 20 years of experience, while 4.9% had less than one year. This distribution shows a sample with a predominance of teachers with intermediate experience. Figure 1 provides a more visual representation of the distribution of teachers by degree program and age group.

**Figure 1.** *Distribution of the sample by career and age group*




*Note.* Authors.

## 2.3 Instrument

The questionnaire by Espada-Chavarria et al. (2022) on effective strategies for more inclusive higher education was used, adapting it linguistically to the local context and validating it using the Delphi method. To assess the reliability of the instrument, it was evaluated using Cronbach's alpha coefficient with a 95% confidence interval, presenting an index of $\alpha = 0.908$, reflecting evidence of excellent reliability (Roco-Videla et al., 2024).

The instrument includes 35 items that correspond to different teaching strategies from the perspective of accessibility, through universal design for learning (UDL) and universal design for instruction (UDI). These strategies are distributed across six dimensions: Curriculum (five items), Multimodal Content (six items), Assessment (three items), Feedback (three items), Teaching Techniques (14 items), and Virtual Learning Spaces (four items), which are assessed using a 4-point Likert scale. The six dimensions correspond to educational actions,

practices, and resources appropriate for teaching programming in a university context.

In addition, to complement the sociodemographic data and contextualize the reality of the teaching staff, nine informative questions were asked. Three of these questions related to their knowledge of the institution's resources for promoting the participation of students with disabilities, as well as the institution's capacity to cater to the diversity of the student body and their own. On the other hand, six questions concerned knowledge of the UDL and UDI, teaching experience with university students with disabilities, and/or experience with other specific educational support needs.

### 2.4 Study variables

The following variables were established: gender, age, years of teaching experience, teaching role, knowledge of UDL and UDI, teaching experience with university students with disabilities and/or experience with students with other specific educational support needs.

### 2.5 Procedure

As part of the actions to assess the level of inclusion of the university, support was provided by the governing team and the dean's and career coordination teams of the faculties. On this occasion, the aim was to publicize the project and give a voice to the agents involved at the teaching level. Data was collected virtually through a questionnaire located in Microsoft Forms. Participants were informed of the ethical aspects of the research and of the evaluation and approval of the project by the Research Ethics Committee of Rey Juan Carlos University.

### 2.6 Data analysis

Descriptive analyses were performed for the questionnaire items (mean, deviation, asymmetry, and confidence interval) and the questionnaire dimensions (mean, deviation, variance, and asymmetry). Subsequently, inferential tests were performed on the items grouped by dimensions and variables. The Kolmogorov-Smirnov test was used to check the normal distribution of the sample. The homogeneity of variances was calculated, assuming different variances, and the null hypothesis was rejected for both tests ($p<.005$). In view of the results obtained, non-parametric tests were performed to establish the existence of statistically significant differences between the dimensions of the questionnaire and the variables, using the Kruskal Wallis H test. Correlation tests between dimensions were performed using Spearman's Rho. Finally, Cohen's *d* test standardized values (0.2 small, 0.5 medium, 0.8 large) were used to calculate the effect size. SPSS Statistics (version 26) was used for data analysis.

## 3. Results

First, the results of the informative questions about the institution's resources and preparation to address diversity will be presented, as well as knowledge of UDL and UDI and teaching experience with students with educational support needs. Subsequently, the results of the questionnaire items grouped by dimensions and inferential tests will be presented, and finally, the results of the items for each dimension and correlational tests.

When asked whether the University has sufficient resources to encourage student participation, only 30.9% say Yes, 39.8% are Not sure, and 29.3% say No. Regarding the university's preparedness to address student diversity, the majority, 56.1%, responded No, and 43.9% responded Yes. Similarly, when asked if they consider teachers to be prepared to address student diversity, 63.4% responded No, and 36.6% (45) responded Yes.

Regarding knowledge of Universal Design for Learning (UDL), 52.8% responded that they do have this knowledge, 29.3% said they were not sure, and 17.9% said they did not have any knowledge. Regarding Universal Design for Instruction (UDI), 46.3% said yes, 32.5% were unsure, and 21.1% said no. Regarding teaching experience with university students with disabilities, 79% stated that they had had students with disabilities in their classrooms, 17.9% had not had such experience, and 2.4% were unsure. The types of disabilities present in the classroom were 28.5% physical or organic, 25.2% visual, 16.3% intellectual, 13% auditory, and 2.4% mental. Likewise, 14.6% did not respond to what type of disability their students had. When asked if they had students with specific educational support needs in their classrooms, 52.8% of teachers said no, 37.4% said yes, and 9.8% were unsure. Among

the most representative data, 34.1% did not identify the needs of their students, 31.7% responded that they identified specific educational support needs as special conditions (personal or school history), and 22% identified specific learning difficulties (dyslexia, dysgraphia, dyscalculia, among others).

Addressing the results of the questionnaire administered on the strategies teachers use to encourage student participation, as can be seen in Table 1, the dimension with the highest mean is Curriculum (M = 3.90), followed by Multimodal Content (M = 3.85), while the Assessment dimension has the lowest mean (M = 3.71). In all cases, the deviations are less than 0.5 and the asymmetry is negative, indicating a certain tendency for responses to cluster around higher values.

**Table 1.** *Descriptive results of the questionnaire dimensions*

| Dimension | Mean | Standard | Variance | Asymmetry |
|---|---|---|---|---|
| Study Program | 3.906 | 0.190 | 0.036 | -2.140 |
| Multimodal content | 3.856 | 0.252 | 0.063 | -2.425 |
| Evaluation | 3.718 | 0.418 | 0.175 | -1.494 |
| Feedback | 3.846 | 0.320 | 0.103 | -2.806 |
| Teaching techniques | 3.880 | 0.188 | 0.035 | -2.553 |
| Virtual spaces | 3.892 | 0.220 | 0.048 | -2.178 |

*Note.* Authors.

In order to establish the existence of significant differences between the dimensions that make up the questionnaire items and the selected variables, the nonparametric Kruskal-Wallis H test was used to verify that there were statistically significant differences based on knowledge of UDL, knowledge of UDI, classroom experience with students with disabilities, and classroom experience with students with other specific educational support needs.

**Table 2.** *Kruskal-Wallis H test for significant relationships between dimensions*

| | Program of Studies | Multimodal | Practical Assessment activities | Feedback | Teaching | Virtual |
|---|---|---|---|---|---|---|
| **Knowledge of the teachers about UDL** | | | | | | |
| H of Kruskal-Wallis | 3,450 | 3,437 | 1,327 | 8,337 | 5,592 | 11,864 |
| gl | 2 | 2 | 2 | 2 | 2 | 2 |
| Asymptotic | ,178 | ,179 | ,515 | ,015 | ,061 | ,003 |
| **Teachers' knowledge of UDL** | | | | | | |
| H of Kruskal-Wallis | 2,517 | 3,481 | ,674 | 4,432 | 7,912 | 8,680 |
| gl | 2 | 2 | 2 | 2 | 2 | 2 |
| Asymptotic | ,284 | ,175 | ,714 | ,109 | ,019 | ,013 |
| **Teaching experience in educating students with disabilities** | | | | | | |
| Kruskal-Wallis H | 9,397 | 2,628 | 3,406 | 1,992 | ,960 | 6,175 |
| gl | 2 | 2 | 2 | 2 | 2 | 2 |
| Asymptotic significance | ,009 | ,269 | ,182 | ,369 | ,619 | ,046 |
| **Teaching experience in educating students with other specific educational support needs** | | | | | | |
| H of Kruskal-Wallis | 6,572 | 3,343 | 6,176 | 4,123 | 2,557 | 8,269 |
| gl | 2 | 2 | 2 | 2 | 2 | 2 |
| Asymptotic significance | ,037 | ,188 | ,046 | ,127 | ,279 | ,016 |

*Note.* Authors.

As can be seen in Table 2, there is a strong relationship between having knowledge of UDL and the use of virtual learning spaces (H (2) = 11.86; p = 0.003), followed by feedback (H (2) = 8.33; p = 0.015). Although the value recorded for Teaching Techniques is close to p=0.05 (H (2) = 5.59; p = 0.061), it cannot be considered a significant relationship.

Regarding knowledge about UDI, relationships are established between Virtual Spaces (H (2) = 8.68; p = 0.013) and teaching techniques (H (2) = 7.91; p = 0.019). On the other hand, with regard to having experience with students with disabilities in the classroom, the second strongest relationship is established with the study program (H (2) = 9.39; p = 0.009) and, to a lesser extent, with the use of virtual learning spaces (H (2) = 6.17; p = 0.046). Finally, experience with students who have other specific educational support needs has a significant relationship with three of the dimensions, the strongest with Virtual spaces (H (2) = 8.26; p = 0.016), followed by Curriculum (H (2) = 6.57; p = 0.037) and Assessment (H (2) = 6.17; p = 0.046).

Next, the structure of dimensions that make up the questionnaire is used to present the results of the items. Table 2 shows the results of the items in the dimensions: Curriculum, Multimodal Content, Assessment, and Feedback.

## Curriculum dimension

This relates to the actions taken at the beginning of the course to clarify objectives, assessment, functioning, and support. Analysis of the teachers' responses shows high means between M= 3.98 and M= 3.83. Teachers agree that defining and explaining the objectives, competencies, and content when the course is presented at the beginning of the academic year (Item 1) (M= 3.98, SD=-7.74) is the most common practice in this dimension, followed in importance by Item 2: explaining the assessment criteria at the beginning of the academic year and in each assessment test. The high negative asymmetry suggests that the responses were mostly high. On the other hand, explaining how the virtual space works (Item 3) (M= 3.84, SD=0.40) and establishing welcoming spaces with personal and/or academic needs (Item 5) (M= 3.85, SD=0.45) are the least used practices in this dimension.

## Multimodal Content Dimension

This dimension relates to the different formats for presenting content and activities. The means range from M=3.65 to M=3.93. Participants agree on using varied activities in different formats that allow them to practice different skills appropriate to the objectives (Item 8) (M=3.93, SD=0.24), as well as providing and presenting content in different formats to access it: text, video in spoken language, video in LSEC (Item 7) (M=3.92, SD=0.29), while this is not the case with the use of complementary materials in different and meaningful formats (Item 11) (M= 3.86, SD=0.37) and, to a lesser extent, with the production of videos with subject content (Item 10) (M= 3.65, SD=0.63), which is the second lowest mean of all the results.

**Table 3.** *Results by dimension: Curriculum, Multimodal Content, Assessment, Feedback*

| Curriculum | M | SD | CA | %IC |
|---|---|---|---|---|
| 1. Define and explain the objectives, competencies, and content when presenting the course at the beginning of the academic year. | 3,98 | 0,126 | -7,74 | 0,022 |
| 2. Explain the assessment criteria at the beginning of the course and in each assessment test. | 3,95 | 0,198 | -4,70 | 0,035 |
| 3. Establish welcoming spaces to comfortably discuss topics related to disabilities, educational needs, or any personal situation. | 3,83 | 0,450 | -3,41 | 0,080 |
| 4. Provide individualized support based on each student's educational needs, with the help of guidance from the Student Welfare Unit (UBE). | 3,90 | 0,348 | -3,84 | 0,062 |
| 5. Explain how the course will work in the virtual classroom, describing the sections and routines that will be followed. | 3,84 | 0,405 | -2,65 | 0,072 |
| **Multimodal Content** | **M** | **DE** | **CA** | **%IC** |
| 6. That the content presented in the classroom is available in electronic format. | 3,87 | 0,36 | -2,74 | 0,06 |
| 7. Provide and present content in different formats for access: text, spoken language video, LSEC video, etc. | 3,92 | 0,29 | -4,28 | 0,05 |

| | | | | |
|---|---|---|---|---|
| 8. Facilitate varied activities in different formats that allow students to practice different skills appropriate to the objectives. | 3,93 | 0,24 | -3,57 | 0,04 |
| 9. Provide online resources for students to use at their own pace when they need them. | 3,89 | 0,34 | -3,06 | 0,06 |
| 10. Create videos with content related to the subject. | 3,65 | 0,63 | -2,06 | 0,11 |
| 11. Suggest meaningful supplementary materials in different formats. | 3,86 | 0,36 | -2,61 | 0,06 |
| **Evaluation** | **M** | **DE** | **CA** | **%IC** |
| 12. Design ongoing, progressive assignments with progress reports instead of a final test. | 3,70 | 0,54 | -1,94 | 0,09 |
| 13. Have students demonstrate their knowledge through means other than traditional exams. | 3,77 | 0,45 | -1,82 | 0,08 |
| 14. Provide rubrics to advance in the subject. | 3,68 | 0,54 | -1,83 | 0,09 |
| **Feedback** | **M** | **DE** | **CA** | **%IC** |
| 15. Facilitate self-assessment activities in the virtual classroom with immediate feedback. | 3,82 | 0,46 | -3,15 | 0,08 |
| 16. Provide continuous feedback and individualized comments for reflecting on skill development. | 3,86 | 0,35 | -2,12 | 0,06 |
| 17. Use different means and forms of feedback: email, rubrics, voice notes, written text, video. | 3,85 | 0,44 | -3,71 | 0,08 |

* M= Mean, SD= Standard Deviation, Skewness Coefficient=SC, Confidence Interval= % CI

## Dimension: Evaluation

This relates to the variety and flexibility of assessment. Some of the lowest means of all dimensions are found in this dimension, ranging from M=3.68 to M=3.77. Item 14 reflects that rubrics are used to a lesser extent to advance in the subject (independently) (M=3.68, SD=0.54), followed by item 12 (M=3.70, SD=0.54), the design of ongoing tasks with progress information instead of a final test. Participants show greater consensus on the use of other ways to demonstrate knowledge, as an alternative to traditional exams, reflected in item 13 (M= 3.77, SD=0.45).

## Feedback Dimension

It relates to the use, types, and means of feedback. It presents very similar averages ranging from the lowest value, M=3.82 corresponding to item 15, which reflects the use of assessment activities in the virtual learning environment that provide immediate feedback, and the highest value, M=3.86, corresponding to item 16, which shows a preference for providing continuous feedback and individualized comments that encourage reflection on the development of activities. In between, item 17 (M=3.85) shows a preference for the use of a variety of means and forms of feedback.

**Table 4.** *Results dimensions: Teaching techniques and Virtual spaces*

| Teaching techniques | M | DE | CA | %IC |
|---|---|---|---|---|
| 18. Use a variety of learning methods and strategies (cooperative, blended learning, projects, among others) | 3,93 | 0,26 | -3,32 | 0,05 |
| 19. Establish work teams in the classroom to encourage collaboration. | 3,93 | 0,26 | -3,32 | 0,05 |
| 20. Allow time in sessions for individual and group reflection and joint discussion. | 3,92 | 0,27 | -3,10 | 0,05 |
| 21. Hold discussions to encourage teamwork. | 3,85 | 0,38 | -2,48 | 0,07 |
| 22. Allow students to express their opinions and/or explore new ideas. | 3,99 | 0,09 | -11,09 | 0,02 |
| 23. Not penalizing students for taking initiative and learning from mistakes in everyday activities. | 3,85 | 0,51 | -3,94 | 0,09 |
| 24. Share your own research related to the topic of study with students. | 3,90 | 0,32 | -3,45 | 0,06 |
| 25. Begin classes with a summary. | 3,60 | 0,65 | -1,57 | 0,12 |
| 26. End classes with a summary. | 3,80 | 0,44 | -2,14 | 0,08 |
| 27. Give advance notice of the content to be covered in the next session. | 3,77 | 0,52 | -2,28 | 0,09 |

| Teaching techniques | M | DE | CA | %IC |
|---|---|---|---|---|
| 28. Provide practical activities to generalize and experiment with learning. | 3,93 | 0,26 | -3,32 | 0,05 |
| 29. Promote student motivation by ensuring that they understand that the content, materials, and activities are appropriate for the objectives. | 3,98 | 0,20 | -8,87 | 0,04 |
| 30. Provide guidelines for understanding new content with real or meaningful examples. | 3,93 | 0,26 | -3,32 | 0,05 |
| 31. Be willing to assist students (tutorials) | 3,95 | 0,22 | -4,24 | 0,04 |
| Virtual spaces | M | DE | CA | %IC |
| 32. Regular use of virtual teaching spaces (virtual classroom/EVEA) | 3,87 | 0,35 | -2,89 | 0,06 |
| 33. That the instructions for preparing or completing assignments are clearly detailed in the virtual classroom. | 3,89 | 0,33 | -3,24 | 0,06 |
| 34. Check that virtual spaces (EVEA / Moodle / Teams / Google Meet / Zoom) can be accessed without difficulty | 3,92 | 0,26 | -3,32 | 0,05 |
| 35. Students can complete tasks at their own pace and study anywhere because they have access to the virtual classroom from different devices (tablet, cell phone, PC, etc.). | 3,86 | 0,40 | -3,28 | 0,07 |

*Note.* Authors.

## Teaching techniques dimension

This dimension relates to the use of methodologies, techniques, and attitudes of the teacher. In this dimension, item 22 stands out as the most prominent of the entire questionnaire (M= 3.99, SD=0.09, CA= -11.09), in which teachers show their orientation toward practices that allow students to express their opinions and explore new ideas. In contrast, item 25 (M= 3.60, SD=0.65) reflects the lesser use of techniques such as starting the class with a summary. On the other hand, promoting student motivation by ensuring that they understand that content, materials, and activities are appropriate to the objectives (Item 29) (M= 3.98, SD=0.20), as well as being willing to provide tutoring (Item 31) (M= 3.95, SD=0.22), using a variety of learning methods and strategies (Item 18) (M= 3.93, SD=0.26), or establishing work teams in the classroom to encourage collaboration (Item 18) (M= 3.92, SD=0.26) are the most widely used techniques in this dimension and are also among the 10 most widely used of all those reflected in the questionnaire. To a lesser extent, previewing the content of the next session (M=3.77, SD=0.52), ending classes with a summary (M= 3.93, SD=0.26), or not penalizing initiative and learning from mistakes in day-to-day activities (M= 3.84, SD=0.51) are used less frequently and are among the 10 least used by participants.

## Virtual spaces dimension

This dimension assesses the use of these spaces, their understanding, and ease of access. Finally, this dimension has the second highest average score after the Curriculum dimension. Participants show greater interest in verifying that virtual spaces can be accessed without difficulty (Item 34) (M= 3.92, SD=0.26), as well as that the instructions for completing tasks are clearly detailed in the virtual classroom (Item 33) (M= 3.89 SD=0.33), expressing the regular use of virtual teaching spaces (Item 32) (M= 3.87, SD=0.35).

Finally, Spearman's Rho test was performed to determine whether there is a correlation between the different dimensions. Table 5 shows the analysis of correlations between the study variables for the sample of teachers, which shows that there are significant correlations between all the dimensions analyzed. Of particular note is the correlation between Feedback and Assessment (r = 0.697; p=0.01), followed by Feedback and Multimodal Content (r = 0.655; p=0.01), Teaching Techniques and Multimodal Content (r = 0.640; p=0.01), Teaching Techniques and Assessment (r =0.618; p=0.01), Virtual Learning Spaces and Feedback (r = 0.609; p=0.01), and Assessment and Multimodal Content (r = 0.605; p=0.01). However, to facilitate observation and understanding of the results, the strongest correlations are identified in dark gray and the more moderate correlations in light gray.

**Table 5.** *Spearman's Rho test to identify correlations between the dimensions of the study*

| | Coefficient of correlation | | | | | |
|---|---|---|---|---|---|---|
| **Rho Spearman N=123** | **Program Studies** | **Multimodal Content** | **Practical Assessment Activities** | **Feedback** | **Strategies Teaching** | **Virtual** |
| Study program | 1 | | | | | |
| Multimodal content | ,563** | 1 | | | | |
| Practical Activity Assessment | ,476** | ,605** | 1 | | | |
| Feedback | ,512** | ,655** | ,697** | 1 | | |
| Teaching techniques | ,584** | ,640** | ,618** | ,573** | 1 | |
| Virtual spaces | ,552** | ,497** | ,595** | ,609** | ,518* | 1 |

*Note.* Authors.

**. The correlation is significant at the 0.01 level (bilateral).

Cohen's *d* test yielded values of 0.34 for the feedback and evaluation dimensions and 0.4 for the evaluation and multimodal content dimension, meaning that the relationships found are close to the intermediate value (d = 0.5).

## 4. Discussion and conclusions

The results obtained allow us to reflect on the current state of educational inclusion in the university context from the teaching perspective and to identify relevant patterns in inclusive teaching practices within the university institution where the study was conducted, especially in relation to the principles of Universal Design for Learning (UDL). Although there is a favorable attitude towards inclusive practices, such as the use of digital technologies and methodological diversification, there remains a significant gap in the perception of teaching and institutional preparedness to address diversity. The majority of teachers do not consider themselves sufficiently trained to address the needs of students, coinciding with the results of Barrera and Moliner (2023), and express little confidence in the institutional resources available. In addition, widespread ignorance about existing support systems highlights weaknesses in institutional communication and the need to strengthen teacher training in inclusion, both initial and continuing. This perception coincides with that of Moriña et al. (2025), who warn that inclusion requires not only teacher training but also sustained institutional commitment. The leadership exercised by management teams is key to consolidating inclusive educational communities, especially in Latin American contexts where structural barriers that limit the participation of diversity still persist (Arias-García et al., 2024). In this regard, a good place to start would be to clarify what inclusion means for the institution, since inclusive education is associated with thinking about how schools should be and function (Arnaiz et al., 2024).

This situation may reveal a gap between the inclusive principles promoted by the UDL and their actual implementation in the university context. In line with the work of Diaz-Vega et al. (2020) and Espada et al. (2023), there is a need to strengthen teacher training in this area and enable them to work appropriately with all students, as this reduces teachers' feelings of vulnerability when faced with unfamiliar and complex situations that they must manage based on their knowledge (López Bastías et al., 2020). However, although participants say they do not feel prepared to meet the needs of their students, the results show that their practices are aligned with a more inclusive pedagogy oriented towards the principles of UDL, coinciding with the results of Carballo et al. (2024) and Diaz-Vega et al. (2020), although social desirability could also be reflected in the responses.

In relation to the principle of engagement, the teaching techniques dimension shows that teachers apply practices that promote motivation, the expression of ideas, and student participation, aligning with the study by Garrad and Noland (2023).

The highest-scoring strategy in the questionnaire, and the one most widely applied, refers to allowing students to express their opinions and explore new ideas, reflecting an openness to student-centered pedagogical approaches. This orientation is consistent with the postulates of Messiou (2019), who highlights the role of students as agents of change in the construction of inclusive environments.

Regarding the principle of representation, the "Multimodal content" dimension shows a positive trend toward diversification of formats, especially in the presentation of content and activities, which may lead to improved learning, as already reflected in the studies by Espada et al. (2023) and Reyes et al. (2022). However, the production of in-house audiovisual materials still has limitations, possibly associated with a lack of technical training or institutional resources. This situation has been documented by Castellano-Beltrán et al. (2024), who point out that digital accessibility remains a challenge in many universities and is considered a fundamental issue for promoting inclusion in higher education (Porto, 2022).

With regard to the principle of action and expression, there has been a transition towards more formative assessment models, although the use of traditional methods persists. It is therefore necessary to promote greater diversification in the forms of assessment, as this is considered very important in order to cater for the variability of the students (Varela and Dans, 2024). Studies such as those by Florian and Beaton (2018) and Meyer et al. (2014) highlight that formative assessment promotes metacognition, allows students to learn from their mistakes, be more motivated, and be flexible. The incorporation of rubrics and progressive tasks is viewed positively, but it has not yet become widespread practice. Feedback, on the other hand, is presented as an established practice, especially in its personalized dimension. Teachers are willing to offer individualized comments and use various means to do so, which reflects a pedagogical awareness of accompaniment in the learning process and has a very powerful influence on learning (Canabal and Margalef, 2017).

Finally, the use of virtual spaces is widespread and viewed positively. Teachers highlight the clarity of instructions and accessibility from different devices, which indicates good technological adaptation. However, as Okai-Ugbaje et al. (2022) point out, the inclusive potential of digital platforms depends on their coherent pedagogical integration and the removal of technical and cognitive barriers.

Significant correlations between dimensions such as feedback, assessment, multimodal content, and teaching techniques reinforce the idea that inclusive practices should not be addressed in isolation, but as part of a comprehensive approach. Furthermore, statistically significant differences based on knowledge of UDL and UDI, as well as experience with students with disabilities or specific educational support needs, suggest that training and direct experience are key factors in the adoption of inclusive practices, as the level of teacher training determines its effectiveness in the classroom (Navarro and Navarro-Montaño, 2023). These results are in line with studies such as that by González-Ramírez et al. (2025), which found that teachers who receive training in UDL are better able to identify barriers, promoting more inclusive teaching.

Overall, the results reflect a solid foundation on which to build a more inclusive institutional culture, but they also highlight the need to strengthen teacher training, review institutional policies, and encourage dialogue among all educational stakeholders. UDL is reaffirmed as a relevant framework for guiding educational transformation toward more equitable, accessible, and student-centered models. The active participation of students and the recognition of teachers as agents of change are key elements in moving toward a truly inclusive university.

This study provides useful empirical evidence for the design of institutional policies that promote educational justice in the Ecuadorian and Latin American context. However, given its exploratory nature, this study has a number of limitations that should be taken into account when interpreting the results obtained. Although the results are a step forward in promoting more inclusive higher education in the Ecuadorian context, it would be important to have a larger number of participants from both this institution and others in the country. In addition, social desirability may have influenced the responses, so these results should be viewed with caution. It is therefore considered appropriate to conduct further qualitative research to observe the reality of classroom practice. On the other hand, in order to continue exploring the inclusive orientation of teaching practices, it would be important to hear the voices of other stakeholders, the students, in

order to understand their preferences for these strategies, as well as to compare whether both stakeholders are moving in the same direction. In any case, designing curricula that address student diversity and take into account their variability and learning preferences is essential in the process of building more inclusive universities. The incorporation of inclusive teaching strategies, accessible materials and resources, and technology, together with flexible assessments, are the starting point for facilitating not only access to education but also for promoting and achieving the desired learning outcomes.

## Authors' contribution

**PhD. Rosa Espada-Chavarria:** conceptualization, methodology, research, data curation, software, formal analysis, supervision, validation, drafting, writing, and editing.

**PhD. Wendy Aguilera Zamora:** conceptualization, research, data curation, formal analysis, drafting, writing, and editing.

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