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Universal Design for Learning and Curriculum

Diseño universal de aprendizaje y currículo

Universal Learning Experience and Curriculum

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ABSTRACT

This research developed in Colombia, started from the question: What is the effect of the implementation of a flexible curriculum based on the Universal Design for Learning (UDL), on the academic performance of the subject Spanish language, specifically in the understanding and production of narrative texts, in students of the 4th grade of primary school with Transitory Special Educational Needs of two rural establishments in the Department of Antioquia, during the first academic period of the year 2017? It was carried out from a mixed approach, with a pre-experimental design and descriptive exploratory study, based on a non-probabilistic sample, using as an instrument a questionnaire that measured 20 students of the 4th grade with transitory special educational needs, reading comprehension and text production at the beginning and end of the implementation of the flexible curriculum based on the UDL. As a result, it was found that at the literal level students go from 60 – 65% to 80 – 90%, inferential from 15% to 35 – 45%, critical from 60% to 75 – 90%, text planning stage from 45% to 80%, writing stage from 35% to 95% and in the evaluation stage of the texts they write from 75% to 80%. In conclusion, there are advances in the semantic, syntactic and especially pragmatic structures of his writings, where the UDL is a facilitating tool in the achievement of goals.

Keywords: Universal Design for Learning (UDL), curricular flexibilizations, Transitory Special Educational Needs (TSEN), Academic performance, Spanish language, Reading and writing competence.

RESUMEN

Esta investigación desarrollada en Colombia, partió de la pregunta ¿Cuál es el efecto de la implementación de un currículo flexible basado en el Diseño Universal de Aprendizaje (DUA), en el rendimiento académico de la asignatura lengua castellana, específicamente en la comprensión y producción de textos narrativos, en estudiantes del grado 4° de primaria con Necesidades Educativas Especiales Transitorias de dos establecimientos rurales del departamento de Antioquia, durante el primer periodo académico del año 2017?. Se realizó desde un enfoque mixto, con un diseño pre-experimental y estudio exploratorio descriptivo, con base en una muestra no probabilística, utilizándose como instrumento un cuestionario que midió 20 estudiantes del grado 4° con necesidades educativas especiales transitorias, la comprensión lectora y la producción de textos al inicio y final de la implementación del currículo flexible basado en el DUA. Como resultados se halló que a nivel literal los estudiantes pasan de un 60 – 65% a un 80 – 90 %, inferencial de un 15% a un 35 – 45%, crítico de un 60% a un 75 – 90%, etapa de planificación de textos de un 45% a un 80%, etapa de redacción de un 35% a un 95% y en la etapa de evaluación de los textos que escriben de un 75% a un 80%. En conclusión, se evidencian avances en las estructuras semánticas, sintácticas y en especial pragmáticas de sus escritos, donde el DUA se constituye en una herramienta facilitadora en el alcance de las metas.

Palabras claves: Diseño universal para el aprendizaje (DUA), flexibilizaciones curriculares, necesidades educativas especiales transitorias (NEET), rendimiento académico, lengua castellana, competencia lectora y escritora.

RESUMO

Esta pesquisa, desenvolvida na Colômbia, partiu da pergunta: Qual é o efeito da implementação de um currículo flexível baseado no Desenho de Aprendizagem Universal (DUA), sobre o desempenho acadêmico da disciplina de língua espanhola, especificamente sobre a compreensão e produção de textos narrativos, em alunos da 4ª série com Necessidades Educacionais Especiais Transitórias de dois estabelecimentos rurais do departamento de Antioquia, durante o primeiro período letivo

de 2017? Foi realizado a partir de uma abordagem mista, com um desenho pré-experimental e estudo exploratório descritivo, baseado em uma amostra não probabilística, utilizando como instrumento um questionário que mediu 20 alunos da 4ª série com necessidades educacionais especiais transitórias, compreensão leitora e compreensão leitora. produção de textos no início e no final da implementação do currículo flexível baseado no DUA.

Como resultados, verificou-se que em um nível literal os alunos vão de 60 - 65% a 80 - 90%, inferencial de 15% a 35 - 45%, crítico de 60% a 75 - 90%, estágio de planejamento de textos de 45% a 80%, etapa de redação de 35% a 95% e na etapa de avaliação de textos redação de 75% a 80%. Em conclusão, há evidências de progresso nas estruturas semânticas, sintáticas e principalmente pragmáticas de seus escritos, onde o DUA é uma ferramenta facilitadora no alcance de objetivos.

Palavras-chave: Desenho universal para a aprendizagem (DUA), flexibilidades curriculares, necessidades educacionais especiais temporárias (NEET), desempenho acadêmico, espanhol, leitura e escrita.

Introduction

Over the past few decades, the constant concern of teachers and education professionals has focused on how to equitably serve their students. This requires that in the pedagogical work that is developed within the classroom, various opportunities for knowledge are estimated; so that it allows to integrate and involve "everyone" respecting their rhythms and learning styles and that the principle of equity is evidenced throughout the teaching-learning process.

In Colombia, Article 5 of the Political Constitution of 1991 recognizes that people with SEN have the right to access quality education throughout their lives, which promotes their integral development, independence and participation, under conditions of equality, in the public and private spheres. One of the main contributions to this common need is the Center for Applied Special Technology (CAST) in its Universal Design for Learning (UDL), which since its inception in 1990 is recognized as a strategy that aims to promote continuous and inclusive learning. The principles established there seek to help in the construction of flexible curricula that reduce learning barriers; based on approaches based on suggestions of materials, instructions, techniques and strategies with which educators meet the educational needs of the largest number of students, taking into account their rhythms and learning styles.

The different studies carried out on this topic, both in Colombia and in other Latin American countries, focus their work on the curriculum and didactics, establishing as a basis the development of flexible curricula that include all students and which reduce learning barriers and provide the necessary supports so that everyone has the same possibilities of accessing knowledge, based on

The Universal Design for Learning (UDL). Among these studies, we find the one made by Conrnejo, C. (2017) in Chile, entitled "Respuesta Educativa en la Atención a la Diversidad Desde la Perspectiva de los Profesionales de Apoyo" (Educational Response in Attention to Diversity from the Perspective of Support Professionals). This study allowed us to conclude that the UDL is an essential tool for attention to diversity, which allows all students to access learning taking into account the needs arising from the context in which they operate but, it is necessary that teachers always keep in mind that the objective of a differentiated educational action is to adapt the responses to the capacities and potentialities of children, girls and young people, to get older and better learning from each of them.

The study conducted by Cáceres, C. Cáceres, Ricardo (2015). Which carried the title of "Lecciones Pedagógicas a Partir de Experiencias Inclusivas Basadas en el Diseño Universal para el Aprendizaje en Chile" (Pedagogical Lessons from Inclusive Experiences Based on Universal Design for Learning in Chile). It allowed to exemplify how the strategies established by the UDL can be applied in the Chilean educational context, identifying elements that must be considered for their implementation, including the enhancing factor of co-teaching, collaborative learning among students and the use of workstations to implement a diversified and flexible didactics.

In this same line we find the contributions made by doctors Espada, M. González, R. (2018). In their research carried out in Ecuador that bore the name of: "Diseño Universal del Aprendizaje e Inclusión en la Educación Básica" (Universal Design of Learning and Inclusion in Basic Education), the evidenced results establish the importance of teacher training in UDL as a didactic alternative in the framework of inclusive education, while reflecting the need for collaborative work between them, aimed at planning content based on the UDL, in order to promote greater understanding and learning of

learners, which at the same time would develop the creative capacity of the teaching staff, taking into account individual differences and the different types of intelligences existing in a classroom.

The study was developed by Ramírez, D. Manzo, F. Zárate, V. (2016). Appropriation of the Principles of universal Design of Teacher Learning in Rural Basic Education Establishments During 2016. From this study it is established that in a real context of education, the principles established by the UDL can be easily implemented by professionals in different conditions and that the mastery of these principles by professionals generate effective results in students.

Research carried out in Colombia by Zamora, R. Velez, J. Paez, H. Coba, J. Cano, C. Martinez, O. (2017) on the implementation of an open educational resource through the model of universal design for learning, taking into account the evaluation of competencies and the individual needs of students, shows that the implementation of educational resources mediated by ICTs through the UDL model, allows the assessment of competencies in a flexible, accessible and adaptive environment according to the individual needs of the students.

Another relevant study is the one carried out by Bedon, N. Delgado, R. Flores, D. (2018) with their proposal for educational innovation using ICTs and Universal Design for Learning Implemented to the General Psychology Course of the University of the Armed Forces "ESPE". Those who demonstrate once again how from the implementation of the UDL and its articulation with ICTs, a significant increase in the development of competencies in university students is generated, reflecting a greater interest in new learning and educational scenarios.

Taking into account the above and given the characteristics of the context, this research aims to determine the effect of the implementation of a flexible curriculum based on the Universal Design for Learning (UDL), on the academic performance of the subject of Spanish language, specifically on the understanding and production of narrative texts, in students of the 4th grade of primary school with Transitory Special Educational Needs (NEET) of two rural establishments of the Department of Antioquia during the first academic period of the year 2017. This, in order to estimate the usefulness of the UDL in the teaching-learning processes, as a tool to favor the pedagogical work in order to guarantee active, dynamic and generating classes of significant learning for all students, including those who present transitory educational needs. In this way, they achieve the proposed objectives and can successfully achieve the competencies established for the school grade in which they are.

To achieve this objective, the following specific objectives are established:

1. To identify the academic performance of the students under study, in the subject of Spanish language, before the implementation of curricular flexibilizations based on the UDL.
2. To establish the academic performance of the students under study, in the subject of Spanish language, after the implementation of the curricular flexibilizations based on the UDL.
3. To recognize the differences and similarities that can be seen in the academic performance of the students under study, at the end of the implementation of the curricular flexibilizations based on the UDL.

The analysis variables are established as follows:

- The UDL, as an approach to promote the understanding and production of narrative texts, in the subject of Spanish language.
- Intervention proposal based on the UDL: "Todos a aprender" (Everyone, let's learn)
- Effect of the UDL on students' academic performance in the areas of reading comprehension and text production.
- Students with special transitional education needs.

The research begins with the analysis of the students of 4th grade of both institutions that show the established characteristics (present a special educational need of a transitory type); after being identified, a diagnostic test (pre test) designed by the researchers is implemented, which allows to identify the competences of the students in the subject of Spanish language, specifically in the competences of comprehension and production of narrative texts. Based on the analysis carried out with the results of this test, the proposal that bore the name of "Todos a aprender" is built, this is projected as an inclusive curriculum, which seeks to generate flexible work environments and methodologies that favor the learning of all students of the 4th grade of primary in the subject worked, based on the principles established by the UDL. Once the implementation of the proposal is completed, the diagnostic test (post test) is applied again. Then the interview is applied in a focus group and finally, the data provided are analyzed through tabulation, measurement, categorization and interpretation, supported by statistical tools and the SPSS computer program, which are subsequently presented in

Excel tables and circular diagrams. For the analysis of the qualitative data provided in the interview, the data reduction analysis technique is used.

Literature Review

Universal Design of Learning (UDL) and Its Influence in learning processes

Universal Design (UD) was a concept initially worked on in architecture in 1970 by Ron Mace, founder of the Center for Universal Design (CUD) in the United States. Its main objective was to design and construct buildings and public spaces that responded to the needs of all people in different aspects such as: communication, use of services, displacement, among others. In this way it sought to take into account people with disabilities from the design phase and avoid the high costs and damages that could arise when making an adaptation of access to a construction. During this process of change, it became evident that these adaptations were used by both people with disabilities and the general public. The above allowed to establish that there are no different categories of people, simply *there is a single diverse population*.

Taking into account the contributions of the UD, the Center for Applied Special Technology (CAST) was created in 1984, in order to support students who had some type of disability in their learning process and thus be able to access more easily the requirements of the established curricula. In 1990 David H. Rose (developmental neuropsychologist) and Anne Meyer (Expert in education, clinical psychology and graphic design) together with a team of researchers, build the Universal Design for Learning (UDL), which collected the latest advances in neuroscience applied to learning, educational research, technology and digital media. It was created with the aim of creating physical environments and tools that can be used by as many people as possible, taking into account that learning implies a challenge in the specific area in which it will occur and to make it possible barriers must be eliminated without eliminating the necessary challenges and thus focus on access to all aspects of learning. Among its main proposals is to propose a new perspective when talking about inclusion and consider that barriers are not part of the individual, but, on the contrary, correspond to external elements that threaten, limit or prevent students' access to an education based on the principles of equality and equity". (Centro Espacio Cumbres, n.d., p.1)

It seeks to meet the objectives of education, those related to the mastery of content, technologies and in the domain of the learning process. It assists educators in creating strategies and

flexible curricula in which the establishment of objectives, methods, materials and assessment that respond to the needs of all students is suggested. From the neuroscientific research that guides the UDL, three fundamental principles are established, from which three guidelines emerge for each with their respective points of verification, which are presented in Table 1. Fundamental Principles of the UDL.

Unlike the traditional curriculum, the evaluation from the UDL transcends the processes, the tools that students use to reach the conceptualization and implementation of the same concept in the solution of problem situations, an aspect that is directly related to the generalization of learning. It is why it establishes evaluation strategies taking into account the learning characteristics of both the group in general and the individuality of the students, respecting their rhythms and styles within the acquisition of the same. Therefore, to elaborate a work proposal from the UDL, the following aspects must be taken into account:

- Recognize the three principles on which it is based UDL
- Review the guidelines into which each principle is divided
- Carefully select the guidelines to be implemented in the curriculum, according to its need, since these guidelines can be used to overcome the barriers inherent in most curricula and can in turn, serve to create options and flexibilizations necessary to maximize learning opportunities.
- Keep in mind that the guidelines should not be applied to a single aspect of the curriculum, which implies that they should be applied when evaluating and planning the objectives, methodologies, materials and methods of evaluation in order to create an accessible learning environment for all.

Academic performance

According to Borgonovo (2013), academic performance refers to the evaluation of the knowledge acquired in the school, tertiary or university environment. A student with good academic performance is one who obtains positive grades in the exams that must be taken throughout a course. In other words, academic performance is a measure of the student's abilities, which expresses what they have learned throughout the training process. It also implies the ability of the latter to respond to educational stimuli, which also links it to aptitude.

Table 1. Fundamental Principles of the UDL.

PRINCIPLE	GUIDELINES	CHECKPOINTS
I. Provides multiple means of representation. (the <i>what</i> of learning)	1. Provides different options for perception	-Offer options that allow customization in the presentation of the information. -Offer alternatives for auditory information. -Offer alternatives for visual information.
	2. Provides multiple options for language, mathematical operations and symbols	-Clarify vocabulary and symbols. -Clarify the syntax and structure. -Facilitate the decoding of texts, mathematical notations and symbols. -Promote understanding between different languages. -Illustrate from multiple media.
	3. Provides options for understanding	-Activate or replace previous knowledge. -Discard patterns, fundamental characteristics, main ideas and relationships. - Guide the procedure of the information. - Maximize transfer and generalization.
	4. Provides options for physical interaction.	- Verify the methods for response and navigation. - Optimize access to tools and supporting products and technologies.
	5. Provides options for expression and communication.	- Use multiple means of communication. -Use multiple tools for construction and composition. -Define competencies with levels of support suitable for practice and execution.
II. Provides multiple forms of action and expression (the <i>how</i> of learning)	6. Provides Options for Executive Functions	-Guide the proper setting of goals. -Support the planning and development of strategies. -Facilitate the management of information and resources. -Increase the capacity to track progress.
	7. Provides options to capture interest	-Optimize individual choice and autonomy. -Optimize relevance, value and authenticity. -Minimize the feeling of insecurity and distractions.
III. Provides multiple forms of involvement (the <i>reason</i> for learning)	8. Provides options for maintaining effort and persistence	-Highlight the relevance of goals and objectives. -Vary the demand and resources for optimizing challenges. - Encourages collaboration and community. -Use feedback oriented towards mastery in a task.
	9. Provides options for self-regulation	-Promote expectations and beliefs that optimize motivation. -Facilitate strategies and personal skills to face the problems of everyday life. -Develop self-evaluation and reflection.

Source: Own elaboration based on CAST (2011)

From what Figueroa (2004) proposed, academic performance reflects the result of the different and complex stages of the educational process and at the same time, one of the goals towards which all the efforts and all the initiatives of the educational authorities, teachers, parents and students converge. It is not about how many topics the student has memorized but how much he has actually incorporated into his behavior, manifesting it in his way of feeling, solving problems and doing or using the things learned. In this way, academic performance is considered as the set of transformations operated by the learner, through the teaching-learning process, which is manifested through the growth and enrichment of the personality in formation. It synthesizes the action of the educational process, not only in the cognitive aspect achieved by the student, but also in the set of skills, abilities, aptitudes, ideals, interests, among others, where a number of factors intervene, including the teacher's methodology, the individual characteristics of the student, the context and family support.

In the case of Colombia and according to Decree 1290 of 2009, this scale is defined as follows:

Article 5. National rating scale:

"Each educational establishment will define and adopt its scale of assessment of the performance of students in its evaluation system. In order to facilitate the mobility of students between educational establishments, each scale shall express its equivalence with the national rating scale:

- Superior Performance (4,6-5,0)
- High Performance (4,5-4,0)
- Basic Performance (3,9-3,0)
- Low Performance (2,9-1,0)

Curricular flexibilizations based on the UDL as an alternative for working with diversity in the classroom

Since UNESCO (2002) in its Universal Declaration on Cultural Diversity, diversity is defined as the range of identities existing in a group of people, which includes race, social class, gender, religion and sexual orientation. In the case of education, diversity represents a wide range of ideas and initiatives to create learning environments that are safe, inclusive and equitable for all students. From this perspective, it constitutes an aspect of the educational environment of great importance so it offers students a broad perception of the world inside and outside the class. This implies that, from

educational planning it must be acted in this line making effective the principle of equality and the exercise of the right to education as established by the Colombian Constitution itself.

For Tuños (2008), classrooms are scenarios where groups of students with a great diversity are concentrated. This means that the levels of teaching and learning are not only focused in a linear way on the learning determined for the educational levels, but also must face all the particular characteristics of the students. Responding to diversity means breaking with the traditional scheme in which everyone does the same thing, at the same time, in the same way and with the same materials. The decisions taken in the educational project of the institutions to respond to diversity materialize in the classroom, since in it the teaching-learning processes mainly take place, and it is in this space where there is a more intense and direct influence on the development of students.

The Curricular Flexibilizations are considered the tangible sample of a true inclusive education. The curriculum as a set of methodologies and processes in favor of an integral formation, must guarantee within the classrooms an integrality from the areas of knowledge and the different institutional projects, in which the implementation of flexible strategies is guaranteed, according to the diversity that is presented, favoring the training processes of all students and motivating them to achieve the learning goals.

Method

This research is developed under a mixed approach, since it has the characteristics that are required to develop data analysis and answer the research question objectively. In this way, the qualitative approach is made use of observation and interview, to describe the behavioral, attitudinal and participatory changes of students; and the quantitative approach uses the numerical measurement of variables such as the assessment score achieved pre and post of the implementation of the evaluative instrument (questionnaire) as a data collection technique.

The research begins with the collection of information from students who are enrolled in grade 4th of the Mazanillo campuses of the Manzanillo Educational Center and the Tíe headquarters of the Punta de Piedra Educational Institution for the year 2017. An applied sampling method was applied, under which students who are reported in SIMAT (Student Enrollment System) are chosen as students with special educational needs

of a transitory type and presumptive students who were detected under the observation of performance, in the activities oriented from the area of Spanish language. The population that benefits from the research of the two establishments totals 50 students.

Taking into account the above information, a non-probabilistic sample of 20 students classified as follows is established:

- Students with attention deficit hyperactivity disorder (ADHD) 3
- Students with behavioral disorders 2
- Students with emotional disorders 2
- Students with reading and writing disorder 2
- Students with slow learning 11

Information collection instruments

As a quantitative instrument, we chose to develop a questionnaire based on the levels of reading comprehension: literal, inferential and critical; and the stages of written production: planning, drafting, revision, and final version. It allows to identify the skills of the students in the competences of production and interpretation of narrative texts.

The qualitative instrument is the interview, which is carried out through a thematic script in focus groups, with the aim of investigating in the students the effect that the strategies implemented from the principles defined operationally through the UDL caused in their learning, where it is possible to delimit which method they prefer: traditional vs UDL.

With these two instruments, the mixed approach is addressed, from the analysis of quantitative and qualitative aspects. In addition, to obtain solid bases for the evaluation of language skills, determine the effect of the strategies implemented taking into account the principles of the UDL on the academic performance of students and estimate the projection of the proposal.

Reliability

The reliability of the test (pre and post) was based on the same measuring instrument, which was submitted to the judgment of experts. After being approved it was applied twice to the population under study, leaving a lapse of 10 weeks between the pre and post test. In this period the application of the UDL proposal is carried out, all the information provided there was analyzed with the sign test, although the sign test shows a high reliability index, a process was also carried out to calculate this coefficient correlating

the scores obtained in the pre-test and post-test samples using the pearson test-retest procedure, "r", which allows the instrument's safety measure to be calculated once again. The direct scores obtained in the applications of the pre-test-post test are presented, which corresponded to the national assessment scale of the student evaluation system.

The survey of expert users is analyzed from the method *Delphi*, in addition to using inferential descriptive statistical methods, all of the above allows to measure the initial and final state of the academic performance of the students, specifying the similarities and differences in said states. Taking into account the above, the level of reliability was 80% since, of the 5 experts there was consensus and acceptance of 4, who in general admitted the script prepared for the interview, only made objections in the writing and high use of some terms for the students. Only one evaluator suggested changing the type of questions used in the interview considering them very open. In this way, the script designed for the interview, allows to indicate the common answers, convert them into categories, encode them and from them, exemplify the most relevant aspects of the interview.

The analysis of the data obtained was done according to specific techniques, such as inferential statistics, descriptive statistics, percentage analysis, application of the SPSS computer program.

Results

Quantitative data analysis.

Responding to the objectives set for this research, the analysis starts from the results obtained by the students in the previous application of the questionnaire (pre test), which precedes the implementation of the proposal: Todos a Aprender, based on the UDL aimed at strengthening the skills of comprehension and production of narrative texts, to later make the comparison with the results obtained in the application of the post test. Also, to be able to identify their progress in:

- Reading Comprehension:
 - Literal level
 - Inferential level
 - Critical level
- Text production:
 - Planning: Organize information.
 - Drafting: Create a text
 - Implementation: Write the text (implementing specific grammatical and spelling aspects)
 - Evaluation: Review the text.

The results obtained here seek to identify if the students improved their performance with a significance level equal to or less than 0.05. It should be clarified that although the sign test showed a high rate of reliability, a process was performed to calculate this coefficient correlating the scores obtained in the pre-test and post-test samples. Assessment of Reliability coefficient of this research is $r = 0,91$. This result indicates that there is a "very high" correlation which is equivalent to saying that the instrument analyzed is highly reliable, in terms of improvement of the results over time. As it can be observed in the following image, the result is $0.000 < 0.05$; therefore, the null hypothesis is rejected and it is concluded: *That there is evidence to affirm that the procedure improves academic results in students of the 4th grade with Transitory Special Educational Needs (TSEN), in the subject of Spanish language, specifically in the competences of comprehension and production of narrative texts with a 95% confidence.* The above can be observed in the Tables 2 and 3

Table 2. Tabulation of pretest and posttest in SPSS

Student	Pretest (x)	Pretest (y)	$\frac{x^2}{XY}$	Y^2	
1	2,8	3,2	7,84	10,24	8,96
2	3,3	3,6	10,89	12,96	11,88
3	3,7	4,1	13,69	16,81	15,17
4	1,2	2,3	1,44	5,29	2,76
5	2,1	3,3	4,41	10,89	6,93
6	2,3	3,1	5,29	9,61	7,13
7	3,2	3,7	10,24	13,69	11,84
8	3,7	4	13,69	16	14,8
9	2,7	3,4	7,29	11,56	9,18
10	3,1	3,3	9,61	10,89	10,23
11	2,5	3	6,25	9	7,5
12	1,9	2,4	3,61	5,76	4,56
13	3,1	3,4	9,61	11,56	10,56
14	3	3	9	9	9
15	3,9	4,3	15,21	18,49	16,77
16	2,2	3,1	4,84	9,61	6,82
17	3,1	3,5	9,61	12,25	10,85
18	3,6	4,1	12,96	16,81	14,76
19	1,7	3	2,89	9	5,1
20	2,7	3,2	7,29	10,24	8,64

Source: Own elaboration

Table 3. Sign Test (Obtained from the SPSS program)

Pretest	Posttest	Students	Difference (pretest minus posttest)	Difference (absolute)	Ranking
19	1,7	3	-1,3	1,3	19
5	2,1	3,3	-1,2	1,2	18
4	1,2	2,3	-1,1	1,1	17
16	2,2	3,1	-0,9	0,9	16
6	2,3	3,1	-0,8	0,8	15
9	2,7	3,4	-0,7	0,7	14
7	3,2	3,7	-0,5	0,5	10
11	2,5	3	-0,5	0,5	11
12	1,9	2,4	-0,5	0,5	12
20	2,7	3,2	-0,5	0,5	13
18	3,6	4,1	-0,5	0,5	9
1	2,8	3,2	-0,4	0,4	8
15	3,9	4,3	-0,4	0,4	6
17	3,1	3,5	-0,4	0,4	7
3	3,7	4,1	-0,4	0,4	5
2	3,3	3,6	-0,3	0,3	4
8	3,7	4	-0,3	0,3	2
13	3,1	3,4	-0,3	0,3	3
10	3,1	3,3	-0,2	0,2	1
14	3	3	0	0	
Ranking Sum (+)					0
Ranking Sum (-)					190
Population N (n)					20
Value W					0
Ties					1
Null hypothesis					

Next, the results in each of the competences that were analyzed during the research are presented in detail, for a better interpretation of them it begins with the quantitative analysis, in which the questions of the pre and post test questionnaire are grouped by competences; the presentation of results is finalized with the qualitative analysis.

Table 4. Table of percentages of Pretest and Posttest Reading Comprehension Literal Level (Obtained from Excel)

READING COMPREHENSION - Literal Level			
Question	Results	Pre-Test	Post-Test
According to the text, the two correct		65%	100%
separately for	Mistaken	35%	0%
The classes will be taught the	Correct	65%	80%
days:	Mistaken	35%	20%
In the story, the friends	Correct	60%	85%
of the soul are:	Mistaken	40%	15%

Source: Own elaboration

As can be seen in table 4 of percentages of pretest and posttest, Reading Comprehension at the inferential level, in the result of the pre-test, a satisfactory level is obtained with respect to the number of students since, between 60% and 65% of them were correct in the group of answers that measure their literal comprehension. However, 30% and 35% answered incorrectly, evidencing notorious difficulties when remembering passages and details of the texts. Once the proposal based on the UDL is applied, the level of literal comprehension in students is increased. It can be observed that it goes from 60 - 65% to 80 - 90%.

Table 5. Table of percentages of Pretest and Posttest Reading Comprehension Inferential Level (Obtained from Excel)

READING COMPREHENSION - Critical Level			
Question Results	Pre-Test	Post-Test	
Do you consider the crocodiles as wild animals, why?	Correct 60%	80%	
	Mistaken 40%	20%	
Would you like to receive classes of painting in your school, why?	Correct 50%	80%	
	Mistaken 50%	20%	
For you, what's the meaning of the expression: "Friends of the soul"?	Correct 40%	90%	
	Mistaken 60%	10%	

Source: Own elaboration

In this set of questions that is observed in table 5 of percentage of Pretest and Posttest Reading Comprehension Inferential level, a low performance in the pre-test is evident, only between 5% and 15% of the students manage to get the answers right, which suggests the difficulty

that they present when establishing relationships between parts of the text to infer information such as: recognize the main idea, the communicative purpose and other aspects that are not written directly in the text. After the application of the proposal Todos a Aprender, the result of the post-test shows an improvement compared to the initial results, the students go from a percentage of 15% to 35% and 45% of successes. It should be clarified that this inferential level should be deepened, although positive changes are observed, certain difficulties are perceived in students for

clearly establish aspects that are not explicit in the text, but that can be identified by the clues that the author himself raises. (observation made from the reading comprehension activities you work during the academic period).

Table 6. Table of percentages of Pretest and Posttest Reading Comprehension Critical Level (Obtained from Excel)

Aspect to Evaluate - UDL Implementation		
Question	Results	Percentage
The activities implemented through the proposal: <i>Todos a Aprender</i> , did you like them, why?	Likes(MG)	55%
	They were Funny (FD)	45
Of the activities that were implemented during the proposal, which ones caught your attention the most and why?	Videos(VD)	25%
	Writing Stories (EH)	20%
	Reading Stories (LH)	15%
	Dramatizations (DR)	15%
	Manual Activities (AM)	25%

Source: Own elaboration

In the last level of comprehension observed in table 6 of percentage of pretest and posttest Reading Comprehension Critical Level, in the pre test the positive performance was varied. Students who performed satisfactorily were characterized by: Respond consistently, although they had spelling errors, contamination and did not use punctuation marks. Their answers were initially correct, but in the end they present an inconsistent argumentation and errors at the time of writing the words.

On the other hand, when analyzing the wrong answers ranging between 40 and 60%, it is observed: Answers with inconsistent argumentation and errors at the time of writing the words. half-baked, inconclusive response or there is simply no answer.

In the results of the post test, we can see the effect of the UDL proposal at this level, where they go from 60% to 75% and 90%.

Table 7. Table of percentages of Pretest and Posttest Text Production (Obtained from Excel)

TEXT PRODUCTION			
Question	Results	Pre-Test	Post-Test
graphic organizer			
Drafting:	Correct	35%	95%
Write the story you planned	Mistaken	65%	5%
Evaluation:	Correct	75%	80%
Planning:	Correct	45%	80%
Plan your story completing the following	Mistaken	55%	20%
Review the text you wrote, using the following guideline	Mistakes	25%	20%

At the stage of text production, three important aspects are evaluated: planning, writing and evaluation, the results can be seen in table

7. Once the first stage (planning) is finished, students write their texts (stories) taking into account the following requirements: assign it a title, take into account the structure of the narrative texts, write with clear handwriting and correctly use the pointing signs and capital letters. In the pre test only a 35% met these requirements. The vast majority of students who erred on this point, changed several aspects that they had raised in the first stage of planning. Another difficulty observed was the structuring of the paragraphs, most wrote in a single paragraph all the aspects that their story should contain (beginning, knot or development, outcome) and those that divided into paragraphs, ignored starting with a capital letter and ending with a period. During the proposal, students had the opportunity to plan and write different narrative texts such as: fables, summaries of myths and legends, biographies and autobiographies, where observations were made at the grammatical level such as: use of capital letters and periods; writing narrative paragraphs, changing or proposing other titles for some of the stories, proposing different endings; among others. Each of these observations were made in a personalized way which generated greater awareness of the aspects to be improved, to be included in their writings.

The mastery of the code is learned, first by writing, then by reflecting on what is written. (Moreno, n.d.).

In the evaluation stage, it is sought that students reflect on their writings and evaluate their strengths and aspects to improve.

In the pre-test, the evaluation chart was filled out by the students without much effort, observing conceptual gaps when they realized their writing deficiencies. In this way, 75% were correctly rated in the evaluation of their writings. Therefore, the feedback that was made during the application of the proposal, emphasized on helping them to be critical in the evaluation of their texts. Thus, once the post-test was applied, it is observed that this evaluation table is carried out with greater dedication and certainty when it comes to recording the strengths and identifying the shortcomings.

Qualitative analysis of the data provided in the interview:

To respond to the objective of: Recognize the differences or similarities that can be seen in the academic performance of students with transitory special educational needs of 4th grade in the subject of Spanish language, specifically in the competences

of comprehension and production of narrative texts, at the end of the implementation of curricular flexibilizations based on the principles established by the UDL. An interview is established, the analysis of which of the answers is presented below.

Table 8. Student Response Percentages on UDL Implementation

Aspect to Evaluate - Participation and Accompaniment		
Question	Results	Percentage
How was your participation during the activities carried out, why?	Very Good(SB)	60%
	Good(B)	40%
Did you feel included and at ease in the activities developed during the proposal, why?	Yes(S)	35%
	A lot(M)	65%
Was there personalized support by the teacher during the development of the topics, why?	Yes(S)	100%

Source: Own elaboration

In the aspect evaluated on the implementation of the proposal, the students felt enthusiastic and motivated during the activities, they state that they were very fun and they liked them very much. During the dialogue that was held with them, comments such as:

"We all learned and had fun" "We were able to meet famous people"

"It was fun to do the dramatization of characters from the stories"

In this way, it was how the two groups that were part of the research coincided in the activities attracted their attention, also presenting greater motivation before the activities that are developed, which directly influences the new results of the first question of the interview, where 11 students identified with the MG category (55%) and 9 students with the SFD category (45%).

In the second question, it is evident how the students were motivated by the variability of the resources that were presented, their positive and diverse opinions, among the activities are:

- The videos because it was so much fun to watch the stories
- I liked writing stories better, because we were able to make our book with stories, fables
- It was a lot of fun when we dramatized the *patasola*
- Make the puppets and the characters with the play dough because we used creativity

The taste for the activities carried out was divided: VD 5 students (25%), EH 4 students (20%), LH 3 students (15%), DR 3 students (15%) and AM 5 students (25%). All these percentages and their comparisons are clearly seen in Table 8

Table 9. Response rate of students on Strategies and Applied Topics

Aspect to Evaluate - Strategies and Applied Topics Question		Results
		Percentage
Would you like the strategies and the classes continue to be held under the proposal of "Todos a Aprender"? why?	Yes(S)	100
	Cuento	15%
	Cuentos(CC)	15%
From the topics developed under the proposal, which one did you like the most?	Between Fables and Morals(FM)	25%
	Myths and Legends(ML)	30%
	My Life One Story to Count(MV)	20%
	All of the above (TA)	10%

Source: Own elaboration

In this second aspect evaluated during the interview, as can be seen in Table 9, 100% of the students express their interest in continuing to work from the proposal; in addition to expressing almost in unison: "we learn more". This question is of great relevance to understand the effect of the UDL proposal on the academic performance of students since, being willing and motivated to continue working under this methodology, it shows the change generated in the patterns of thought in the face of the acquisition of new knowledge, where routine activities and little adjusted to their performance levels have no place. The proposal *Todos Aprender*, was designed taking into account that students with STEN need to explore their skills from different dimensions (playful, artistic, communicative, body, technological), giving the possibility for everyone to access the topics from different options. In this case it is valid to highlight one of the premises cited in the UDL: it is necessary to develop a curriculum that provides all students with equal opportunities to learn (CAST, 2011).

In the question about the topics, each of these caught the attention of a certain group of students, evidencing the enjoyment in the diversity of the stories. Therefore, the variability of their responses and preferences, some of them were:

- "I liked the theme of my life a story to tell because I was able to meet famous people and tell the story of my own life."
- "I liked myths and legends because we performed and it was fun."

Table 10. Response rate of students on Participation and Accompaniment

Aspect to Evaluate - Participation and Accompaniment		
Question	Results	Percentage
How was your participation during the activities developed, why?	Very Good(SB)	60%
Did you feel included and at ease in the activities developed during the proposal, why?	Yes(S)	35%
Was there personalized accompaniment by the development of the topics, why?	A lot(M)	65%
	Yes(S) 100% teacher during the	

Source: Own elaboration

In the last aspect to be evaluated during the interview, about the participation and accompaniment provided by the teacher, the students responded to the questions with expressions such as:

- "Great, teacher" "we felt more animated to express our thoughts."
- "It was good because at first some classmates were not motivated to write or to share their writings and that was improved."

On the other hand, another of the differences that produced the UDL proposal can be established, since at first the students refused or felt shy when expressing their ideas. After the implementation of the proposal, their participation was motivated by the activities that were carried out, none of them were disinterested when it came to making their puppets, when writing their life stories or participating in them. The data quantitatively in the first question, were established as follows: SB, 12 students (60%) B:8 students (40%).

In the second question, the students state the following:

- "Everyone was given the opportunity to participate, the teacher guided us to do things well"

- "The teacher took us into account to make the activities"

When students are included and let themselves be "acted", we achieve that they can feel part of the activities and are themselves the ones who later hope that this type of strategies are not lost. Including it allowed students with STEN to contribute their ideas and realize that they possess skills that can be strengthened. Quantitatively, the data in the first question, were established as follows: S, 7 students (35%) M: 13 students (65%).

In the last question, the students remember and express that they were accompanied a lot when they had to write stories "You (the teacher) called us one by one to review the writings and told us if it was okay or something needed to be improved". In addition, during the dialogue, experiences came to light such as: "when they did the comprehension workshops and we did not understand a question, one called it, and you came to the post and explained to us". Likewise, the students of the Manzanillo headquarters recognized the accompaniment made by the teacher with comments such as: "You were attentive and helping us" "when you did not understand the teacher repeated us". In general, 100% of the students (n=20) recognized the timely and assertive accompaniment by the teachers; these results can be seen in detail in Table 10.

From the qualitative analysis, the importance of individually accompanying the needs of the students is evident, stimulating the creation of flexible designs from the principles of the DUA, with personalized options that allow all students to progress from where they are and not from the imaginary of the teacher.

Discussion

The UDL aims to create physical environments, cultural environments and tools that can be used by as many people as possible. It is based on the principle that, *all learning implies a challenge in the specific area in which it will occur, and for this to be possible barriers must be eliminated without eliminating the necessary challenges*. At the same time, taking into account its principles, it seeks to promote access in all aspects of learning and meet the objectives of education from equity. It guides educators in creating flexible curricula, where it suggests that objectives, methods, materials, and assessment cater to the specific needs of all students, taking into account the context, their rhythms, and learning styles. Studies such as the one carried out by Cornejo, C. (2017) in Chile, demonstrate the need to work on the tools established by the UDL, so that all students regardless of their characteristics can access learning and develop their own competences

to the maximum. In this same order of ideas, Càceres, C. Càceres, Ricardo (2015) in Chile, show us how the enhancing factor of co-teaching, cooperative learning and the use of the strategies proposed by the UDL can guide learning processes from a flexible position that favors the integral development of students. Within this group of works at the Latin American level, it is important to highlight in the same way the contributions of the study carried out in Ecuador by Drs. Espada, M. González, R. (2018). Where they show us once again the UDL as the didactic alternative in the framework of inclusive education, which must have a cooperative work between teachers and those in charge of the educational process of any educational institution. In the same way Ramírez, D. Manzo, F. Zárte, V. (2016). show us how these strategies can be implemented in any type of educational institution regardless of its context or location, the only requirement is the openness of the teacher to change and the responsibility with him in the process of training his students.

It should be clarified that ICTs are a very useful tool when generating activities and the approach of students to learning, if they are articulated with the strategies proposed by the DUA, generate greater results, as shown by Zamora,

R. Velez, J. Paez, H. Coba, J. Cano, C. Martinez, O. (2017). In their research conducted in Colombia and Bedon, N. Delgado, R. Flores, D. (2018). With their research carried out in Ecuador at the University of the Armed Forces "ESPE".

Taking into account the above, The Universal Design for Learning as in its beginnings in architecture, must face the particular needs of the educational population, that is why when we build a curriculum based on the UDL, criteria, curricula, programs, methodologies, and processes must be planned in favor of the integral formation of students, keep in mind that there is no single way to perform a task or to express learning that is optimal for all students. Therefore, in teaching practice it is necessary to provide different options to carry out the learning tasks and the way to express that they have been achieved. In this way, through the practical implementation of the principles of the UDL and through the design of appropriate response strategies, the obstacles that limit some students given their characteristics can be eliminated, remember that we are all different and learn differently, and that is why every teacher must also think about the importance of captivating and motivating learning, motivate them to achieve the goals of knowledge and develop activities that arouse interest and desire to participate, in addition to facilitating access to quality education under a focus

of real inclusion and integration in the classroom, this aspect it is proven once again in this research.

Conclusions

The results obtained in this research show significant advances in the reading - writing process of students who present transitory educational needs, in aspects such as: text analysis, identification of the topic, recognition of the main idea and the communicative purpose; which reflects a greater mastery of reading comprehension. The students go from a basic literal level to an advanced literal level and even, several of them managed to place themselves at a level of basic inferential interpretive reading. In the written production part, in which greater shortcomings and conceptual gaps were found in the pre-test since, the students wrote their stories without taking into account aspects such as: the structure of the narrative text, thematic thread, correct writing of words, use of punctuation marks and spelling rules. At the end of the implementation of the flexible curriculum based on the UDL, they were more receptive, willing, open to fantasizing and translating their ideas into written productions, paying greater attention to the time of writing, reflecting this aspect in the correct writing of the words, paraphrasing the stories, making summaries, using the explicit data in the text, making conjectures and making evaluative judgments against the content or author of the text.

In this sense, the application of the pre and post test which only had the duration of an academic period of ten (10) weeks, allowed to establish not only the aspects in which the students improved, but also to be aware that there are still similarities in the initial and final state. Some grammatical mistakes persisted when writing such as: inappropriate use of the plural and singular, inappropriate use of commas and capital letters, little internalization of spelling rules. Regarding the comprehension of texts, emphasis should be placed on the inferential level, where only a slight advance could be observed, establishing itself as the level that costs the students who were intervened the most. This allows to establish parameters to guide the work of the next academic period with these students.

On the other hand, regarding the modality of work and proposal in general, evaluations are highlighted in aspects such as: The information used in the conceptual and theoretical framework, guided the direction of the research, leading to reflect on the strategies that allowed to define the initial and final state of the academic performance of the students of the 4th grade, of the related educational venues. The exploratory-descriptive study allows to have clarity in the objective of the research, and to trace paths to reach it concrete. In fact, because it is of an exploratory type, the research uses the curricular

proposal as a strategy to analyze the initial and final academic status of students. In this same order of ideas, the information collection instruments that were implemented from the mixed approach, quantitative and qualitative, allow to give an evaluative look at the skills of the students in their initial and final state. And the interview proposed through the thematic script favors that qualitative quota of the research, while it gives an account of the new attitudes, behaviors and in general the feeling of the students once the proposal based on UDL was implemented: Todos a aprender.

This research is of great relevance for pedagogical and curricular work, given that it focuses on a basic subject for learning such as Spanish, it is also taken as a reference to measure the performance of educational institutions; through SABER tests. In this way, the UDL becomes an essential tool in the planning and curricular support of this subject, providing different means, variability of strategies, materials, time management and strategic location of students to assertively address the learning difficulties they present.

Based on the study done, the following recommendations can be established aimed mainly at teachers:

- It is important to recognize in each of the students their abilities, tastes and interests; this allows us to know more precisely how to plan and apply learning strategies.
- In rural establishments one of the advantages are groups with a small number of students, which allows or facilitates personalized work. Therefore, it is important to take advantage of this situation and start working from and for inclusion, always taking into account the principle of equity.
- Establish an alternative action plan, which allows to overcome some class losses, due to various activities that are programmed at the institutional level. Precisely, the research initially took a while and several of the activities had to be carried out in a shorter time than planned; because academic days were planned from the educational establishments that altered the application of the proposal.

In conclusion, the research taken into account has addressed from several points of view that, the UDL as an instrument of teaching learning ensures equal opportunities; the real challenge of educational institutions and education professionals

is to develop flexible curricula that implement the UDL in order to provide inclusive and effective learning opportunities for all students, taking into account equal opportunities to learn and develop their competences to the fullest.

Bibliography

Borgonovo, D.B. (2013). Deseo de saber y Rendimiento académico: Puntos de encuentros.

Cáceres, C., & Cáceres, R. (2015). Lecciones pedagógicas a partir de experiencias inclusivas basadas en diseño universal para el aprendizaje en Chile. In V Congreso Internacional de Investigación de la Facultad de Psicología de la Universidad Nacional de La Plata (La Plata, 2015).

CAST (2011). Universal Design for Learning Guidelines version 2.0. Wakefield, MA: Author. Spanish translation version 2.0. (2013).

Chuquimarca, D. K. F., Rodríguez, R. D., & Bedón, A. N. B (2018). Propuesta de innovación educativa utilizando TICs y el Diseño Universal para el Aprendizaje implementada a la asignatura de Psicología General de la Universidad de las Fuerzas Armadas" ESPE". Revista Ibérica de Sistemas e Tecnologías de Informação, (E15), 292-303.

Cornejo, C. (2017). Respuesta Educativa en la Atención a la Diversidad desde la Perspectiva de Profesionales de Apoyo. Revista Colombiana de Educación, (73), 77-96. Retrieved from file:///D:/article/review%20en%20revistas%20indexadas/Scielo/respuesta%20educativa%20currículo%20flexible.pdf

Espada, M. Gallego, M. González, R. (2019). Diseño Universal Del Aprendizaje E Inclusión En La Educación Básica. Alteridad Revista de Educación, vol 14 (2), 207 - 218. Retrieved from file:///D:/article/review%20en%20revistas%20indexadas/Scielo/DUA.pdf

Figuroa, C. (2004). Sistemas de evaluación académica, San Salvador: Editorial Universitaria.

Manzo, F. Ramírez, D. Zarate, V. (2016). Apropriación de los principios del diseño universal de aprendizaje de los docentes en establecimientos rurales de educación básica durante el año 2016. Universidad Mayor. Sistema de bibliotecas repositorio. Santiago de Chile. Retrieved April 14, 2019, from. <http://repositorio.umayor.cl/xmlui/handle/sibum/4872>

Martinez, B. A. (2008). La formación de competencias docentes para incorporar estrategias adaptativas en el aula. Revista complutense de educación, 19(2), 253-274.

Moreno, F., Marthe, N., & Rebolledo, L. A. (2011). Cómo escribir textos académicos según normas internacionales: APA, IEEE, MLA, VANCOUVER e ICON-TEC. Universidad del Norte.

Zamora, R. Velez, J. Paez, H. Coba, J. Cano, C. Martinez, O. (2017). Implementación De Un Recurso Educativo Abierto A Través Del Modelo Del Diseño Universal Para Aprendizaje Teniendo En Cuenta La Evaluación De Competencias Y Las Necesidades Individuales De Los Estudiantes. Revista Espacios, Vol 38 (Nº 05). Retrieved from file:///D:/ artículo/revisión%20en%20revistas%20indexadas/scopus/DUA%20(1).pdf

