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Exploring Universal Design for Learning as a Need-Based Learning Approach: A Review of the Current Literature

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Abstract

The present study addresses the need for UDL applications in developing an inclusive classroom and the degree to which such applications assist the diverse learning needs of differently-abled learners. The methodology follows a rapid review of the available literature, a review of twenty-five papers published from 2001 to 2023 was undertaken. The findings suggest that UDL applications are based on three concepts of brain networks as developed by CAST, UDL grants equal access to students with varying needs, technology applications enhance the utility of UDL and teacher pre-service training should have exposure to UDL concepts.

Keywords: universal design for learning, need-based learning approach, inclusive education

Introduction

Diversity among students is one of the greatest challenges that teachers encounter in the modern classrooms of the new century. A major question for teachers is how to cater to each child's individual needs, talents and aspirations and mould them into contributing members of the society. Inclusive education goes beyond addressing the learning needs of each child; it also tackles the barriers that hinder the meaningful and effective participation of pupils. Therefore, it is crucial to

establish a framework that can meet the learning needs and encourage the active involvement of all types of learners. Universal Design for Learning (UDL) serves as a blueprint which both enables and empowers learners with different abilities. According to CAST, "UDL is a framework for optimizing teaching and learning for all pupils based on scientific insights into how humans learn" (http://www.cast.org). Universal Design for Learning provides the opportunity to adjust the curriculum, customise teaching and learning strategies, and utilise various assessment methods based on students' abilities. Initially, Universal Design concepts were originally developed for architects and product designers, but its principles have since been adopted in education. "UDL is an educational concept or approach to designing instructional methods, materials, activities, and evaluation procedures to assist people with differences in their abilities to see, hear, speak, read, write, understand, move, attend, engage and remember" (Orkwis, 2003, n.p.). UDL is based on the concept that there is no single method of presentation or expression that grants equal access for every learner and learning experiences are designed flexibly and extend multiple ways to learn (Richard M. Garguilo, Debbie Metcalf, 2022, p.11). UDL has the scope for flexible, equitable, and accessible teaching methods which enable every student to learn at his or her own pace thus generating the greatest results in the learning process.

Centre for Applied Special Technology (CAST) is a non-profit organisation focused on education research and development. It was established in 1984 and is headquartered in the United States. CAST developed UDL to meet the requirements of all types of learners including the disabled. This organisation is trying to provide learning opportunities for every learner especially those with disabilities by applying the principles and technology of UDL which is necessary when considering the modern inclusive classroom environment. Developers at CAST enumerated three principles of UDL for learning while planning a curriculum to meet the requirements of all learners (Richard M. Garguilo, Debbie Metcalf, 2022, p.45)

Based on research into the nature of learning differences and the design of supportive learning environments, the UDL principles are built on three groups of brain networks - recognition, strategic and affective networks that play a major role in learning (Rose & Meyer, 2000) The main principles of Universal Design for Learning are as follows.

o   Furnish different ways of representation, to support recognition learning - extend flexible ways to present what we learn and teach.

o   Furnish different ways of action and expression, to support strategic learning, - extend flexible options for how we learn and express what is known to us.

o   Furnish different ways of engagement, to support affective learning, - extend flexible options for generating and sustaining motivation, the why of learning.
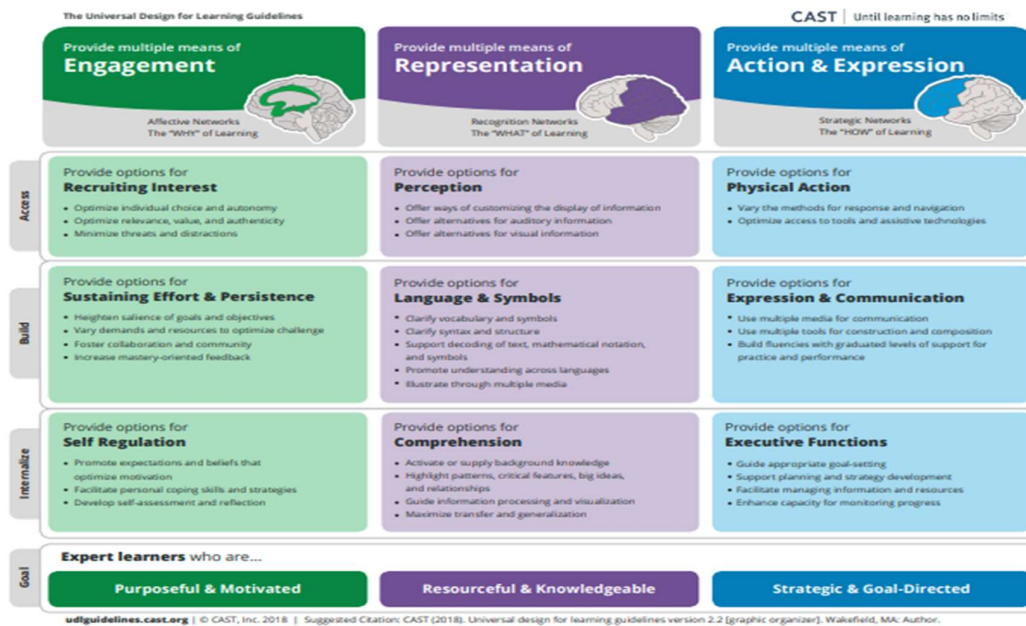
This paper attempts to review the present literature on Universal Design for Learning and present the findings to draw an objective inference on its applications, in supporting learning.

Objectives of the Study

1. To analyse the need for Universal Design for Learning applications in present day classroom setting.

2. To examine the extent to which Universal Design for Learning caters to the learning requirements of differently abled children.

Methodology

The methodology selected for the study is based on the objectives of the study and best practices followed by the research community. A rapid review approach was found to be most suitable for the study. Rapid reviews are a form of knowledge synthesis in which the systematic review process is simplified to produce information more quickly (Khangura et al., 2012). Keyword search was done with ProQuest, Springer and EBSCO, JSTOR, ERIC databases, ResearchGate and other websites. The search was circumscribed to articles published for the last twenty-two years. The review of literature was done comprehensively with maximum emphasis on relevant studies to obtain accurate outcomes. This includes articles with a theoretical basis and empirical based articles and reports. The studies selected are from the year 2000 onwards.

Analysis and Interpretation

The following table presents the data related to the review done on the relevant current literature objectively:

Name of the Author	Focus Area	Source/Database	Findings	Year
David Rose	Value of Universal Design for Learning.	Researchgate	UDL can be effectively implemented in the classroom with the support of Assistive	2001

			Technology. By accommodation and modification, UDL can be fully accessible.	
Terese C. Jiménez, Victoria L. Graf, & Ernest Rose	Universal Design for Learning and its Access in General Education	ERIC	Proposed methods of instruction that support UDL and described the Concord Model to support UDL. Suggested that education professionals should make additional efforts for the implementation of UDL	2007
Margaret King-Sear	Universal Design For Learning: Technology and Pedagogy.	JSTOR	Through equitable use of instructional material through technology, practice and presentation of curriculum content in different ways, tolerance for error, and presentation of content easily and comfortably and also based on the background knowledge of the students, UDL can be effectively used in the curriculum.	2009
Dave L. Edyburn	Ten Suggestions and for the Implementation of UDL.	Sage Publication	Studied the process of UDL and suggested ten ways for the future implementation of UDL and the need for implementing UDL in the educational system.	2010
Meia Chita-Tegmark, Jenna W. Gravel, Maria De Lourdes, B. Sepra, Yvonne Domings and David H. Rose	Application of Universal Design for Learning Framework for Culturally Diverse Learners.	JSTOR	Illustrated how UDL principles will be useful to carry out a culturally informed curriculum so that it is useful for improving the education of learners globally.	2011

Solange Lopes-Murphy	Universal Design for Learning and Academic Accessibility of High School English Learners.	EBSCOhost	UDL considers the requirements of learners in preparing the curriculum and provides equal opportunity for all. UDL has the scope to overcome the barriers that prevent the learning of English.	2012
Jennifer Katz	'The Three-Block Model' of Universal Design for Learning (UDL)	JSTOR	Demonstrated a positive outcome of the 'Three-Block model' of UDL. Students in the UDL classroom were more engaged than in the inclusive classroom. Academic and social engagement improved while using this model.	2013
Sabeena P S, Priya Gopinath and Dr N. Muthaiah	Importance of Universal Design For Learning in the Inclusive Setting	DOI.org	UDL framework is a better platform for educating different types of learners because it is based on brain networks specially designed for all with specific needs.	2014
Kimberly M. Johnson-Harris and Nancy A. Mundschenk	Universal Design for Learning and Students with Behavioural Disorders	EBSCOhost	With the assistance of UDL principles, children with behaviour disorders can be engaged smoothly and educators can save time, energy and enhance classroom dynamics.	2014

Janet Mannheimer Zydney and Ted S. Hasselbring	Universal Design for Learning Approach- 'Mini Anchors'	EBSCO host	They have proposed a Mini Anchor Model for mathematics learning. Mini Anchor Model would apply to various fields and learning becomes effective based on the needs of children.	2014
Spencer J. Salend and Catharine R. Whittaker	UDL: A Blueprint for Learning Success.	EBSCOhost	UDL framework puts teachers in the role of educational architects who design student success and suggested a new 'Seven-Step Pedagogical Model' to assist teachers in developing UDL instructional blueprints.	2017
Tanmoy Bhattacharya	Universal Design for Learning for Meaningful Inclusion.	Online Library	Suggested integrating UDL as a practice in the legislation and teacher education programmes which can make positive changes in the education system.	2017
Elizabeth M. Dalton, Marcia Lyner-Cleophas, Britt T. Ferguson and Judith McKenzie	Universal Design for Learning in Higher Education of South Africa and United States	EBSCOhost	There are challenges in the process of inclusion in higher education, but there are potential solutions. All future teachers should know the inclusive education practices and models.	2019
Lisa A. Finnegana and Lisa A. Diekerb	Universal Design for Learning in the Science content expansion	EBSCOhost	'UDL-Representation concepts were implemented in the class, and the amount of knowledge obtained and depth of discussion were richer when this concepts were used.	2019

Harit Bagga and Adit Kaur	National Education Policy 2020 and Universal Design of Learning.	Online Library	Suggested effective ways to implement UDL and the factors that assist UDL in India.	2020
Christopher D. Hromalik, William N. Myhill & Nancy R. Carr	Universal Design for Learning Training for Community College Faculty.	EBSCOhost	A two-phase faculty training programme in UDL was conducted and all the faculty responded positively.	2020
Radhika Misquitta and Rudri Joshi	Universal Design for Learning to Supporting the Struggling Learners.	Online Library	Describes learning tools that can be effectively used based on the principles of UDL with the help of technology.	2020
Alicia Mrachka	Universal Design for Learning to Plan for All Students in the Classroom	EBSCOhost	Suggested ways to improve learning by adding written text with vocal instructions, visual support like pictorial or graphic explanations and large print to help struggling learners.	2020
Anupam Ahuja	Universal Design of Learning for Effective Classroom.	www.education. gov.in	Developed Barkhaa Series for all based on the principle of UDL.	2020

Lee Ann Jung	Lesson plan based on the Universal Design for Learning	EBSCOhost	Suggested different strategies for the execution of UDL principles in the classroom.	2021
Susie L. Gronseth, Jill E. Stefaniak, & Elizabeth M. Dalton	Universal Design for Learning and its Development	Online Library	Universal Design for Learning can be designed for individuals, addresses different methods, provides guidelines and checkpoints and creates learning environments for the varying needs of learners. Imparts better instruction by taking into account equity and accessibility considerations.	2022
Alexandra Sewell, Anastasia Kennett and Victoria Pugh	Universal Design for Learning as an Inclusive Practice Theory	Taylor and Francis + NEJM	UDL has potential as a theory of inclusion. It creates a learning environment and opportunities for all learners.	2022
Som Krishan and Navneet Sharma	Universal Design for Learning (UDL) and its Awareness among Teachers in India.	DOI.org,	The viewpoints of in-service teachers regarding UDL must be included in the curriculum. NCTE and RCI in its curriculum can include the theory and practice of UDL.	2023

| M. Mackey, S V Drew, j Nicoll-Senft and L. Jacobson | A Change in Theory with the help of Universal Design for Learning | ScienceDirect | Analysed how to use UDL to hold up disabled students and suggested better model integration of technology and the need for improvement of UDL checkpoints. | 2023 |
| Shano Ji | Universal Design for Learning and its Barriers for Implementation | ddeku.edu.in | There is an immediate need to understand and cater to the needs of different students. Teachers need new training, skills and support from education systems. | 2023 |

Significant Findings

o   With the help of accessibility technology, obstacles for pupils with disabilities can be reduced

o   To gain accessibility, efficiency and sustainability of UDL, collaborative and multiagency approaches may be implemented in the schools

o   UDL can be effectively implemented in the classroom with the help of Technology

o   UDL principles are effective to build a culturally informed curriculum

o   Academic accessibility of English subject can be improved with the help of UDL

o   Students' academic and social engagement may be improved with the help of UDL

o   Since UDL is based on the principle of brain networks it is highly beneficial for both teachers and students

o   Children with Behavioural Disorders can be handled smoothly with the assistance of UDL

o   To make revolutionary changes in the education system, UDL should integrate into the legislation and a part of teacher education programme

o   There are scope for the implementation of UDL as envisioned in NEP 2020

o   Even with the existing technology, if planned properly UDL can be effectively implemented in the classroom

o   NCERT developed 'Barkhaa Series for ALL' based on the principle of UDL

o   With the help of UDL effective and efficient instruction can be exhibited by considering equity and acccessiblity of all learners.

o   Over thirty years UDL has matured from a curriculum design framework to instructional design theories.

o   UDL as a theory of inclusion has the potential to create a conducive learning environment and opportunities for all

o   NCTE and RCI in its curriculum should include the theory and practice of UDL.

Conclusion

On review of the literature, it is found that UDL is a very effective method for inclusion as it is rooted in the principles of brain networks which has been reaffirmed by several studies. The need for the same has been stressed as the most important factor in successful transfer of knowledge in an inclusive classroom. It assures that the diverse needs of the learners are met and they have equitable access to the instruction provided. Models like the Concord Model can also be developed by teachers and educators. In addition, teachers should be conversant with modern technology applications as UDL depends heavily on technology. Awareness of UDL should also be given to teachers during their pre-service training period itself. UDL caters to the requirements of

students with different abilities to a large extent and thus enables the development of a culture of inclusiveness in the classroom.

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