Awareness of Universal Design for Learning (UDL) among Teachers in India

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Abstract: *The present study investigates the awareness of Universal Design for Learning (UDL) among special and general teachers working in inclusive settings. UDL is a framework used to design a curriculum reachable to students with all abilities. UDL assists teachers to increase meaningful access to the curriculum and remove barriers for students with all abilities in learning. The roles and responsibilities of the teachers play an important role in implementing and transacting any curriculum to the learners. In the present study, the sample consisted of 429 teachers, teaching in primary, upper primary, secondary, and higher secondary stages of regular schools in Himachal Pradesh state of India. The sample for this study was selected through the purposive sampling technique and the descriptive survey research design was employed in the current study. Assessing awareness among teachers about UDL the questionnaire on UDL was used on the selected samples. The data was collected from samples through face-to-face interaction. Descriptive and inferential statistics were applied to compare the awareness level of UDL between special and general teachers. The result revealed that the teachers in Himachal Pradesh were not fully aware of the UDL. Special teachers have a higher awareness of UDL than general teachers and the successful implementation of UDL in inclusive setting require an entire school approach wherein every part of the system should be geared to address the needs of diverse students.*

Keywords: universal design for learning, inclusive settings, inclusive education, teachers awareness, special education

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Introduction

We as human beings attain new information and gain new experiences and aptitudes, perspectives, and social qualities. We figure out how to love and despise, to fear, and act naturally. All these and numerous such confirmations are instances of learning. Learning has been the most discussed and debatable issue from antiquity to contemporary times. The questions on which the process of learning focuses on are what to learn and how to learn. The learning of children with an inclusive approach is one of the challenges for academia (Bhat & Geelani, 2017). We have come up with different learning approaches to cater to all children in inclusive settings (Loreman et al., 2005). But, we have not yet succeeded in providing learning opportunities to all sections of our community because to include every child of varying abilities is quite challenging for both the administration as well as the teacher (Liasidou, 2015). Inclusion at the school level is very vital for the attainment of constitutional values (UNESCO, 2017). The inclusion of children in the classroom needs progressive pedagogy as well (Florian & Black-Hawkins, 2011).

Inclusion is all about mainstreaming education by removing barriers to bringing all children together in school irrespective of their physical and mental abilities (Tuli, 2008). In India, the Rehabilitation Council of India states that we have about thirty million differently abled children who are out of school and we have a very small percentage of these children in our formal education system (MHRD, 2004). Compare to schedule tribes or scheduled castes, they are five times more likely to be out of school (World Bank, 2007), it also highlighted that the enrolment rate of differently abled children is least compared to non-disabled (Bhat & Geelani, 2017). The mainstream education system in India

is not as per the needs of differently-abled children. India has succeeded to some extent in enrolling children with different abilities in mainstream education, but we still lack the inclusive environment needed for the proper functioning of inclusive education. On one side, the lack of infrastructure is not able to cater to the needs of differently-abled children; on the other side, unprepared teaching staff has become a challenge for India (Bhat & Geelani, 2017). Das (2021) highlighted that all teachers were not aware of the term inclusive education and that learners should learn together under one roof. Inclusive setup is not only to enroll children with different abilities but to meet the learning needs, physical needs, and emotional needs of every kind of child in the classroom. Children with different abilities should not be isolated, and accommodated. Inclusion into the mainstream is only possible through implementing progressive pedagogy at the classroom level.

The role of the teacher becomes very important in the classroom of children with different abilities. A teacher has to identify the needs and provide relevant learning experiences to children of different abilities. A teacher is the facilitator of the students in the classroom and the facilitation trait of the teacher becomes more important in inclusive settings. Teachers' intervention in the classroom having students with different abilities is as important as the student itself. The classrooms need new innovative learning strategies in such classrooms which democratically include all the students to make them productive members of society. The pedagogy of the teacher will surely determine the success of the learning processes of students with different abilities and universal learning design is one such approach that the authors have taken to research in this study.

India has time and again come up with

different policies and approaches to cater challenges of contemporary societies the universalization of education is one such approach. The educational approach of universalization of education focuses on the access, enrolment, and retention of all students. It has given the vision for the inclusive instruction of students with different abilities as it emphasizes the idea that without such consideration, the goal of universalization of education cannot be accomplished. For the effective execution of inclusive education in India, the guardians, teachers, and even the students must be aware of the inclusive framework and its advantages (Kundu & Dey, 2018; Parveen & Qounsar, 2018). Imperative is to comprehend the genuine issues that the guardians of students with different abilities face, which make them enrol their kids into special schools. Additionally, similarly essential is to break down the obstructions that hinder the process of inclusive education. We have diverse problems in our education system regarding children with different abilities because of an absence of well-trained teachers, a deficient framework, the additional consideration that these students must be furnished with, and negative demeanour of friends and guardians of students, social predisposition, and so on.

Though we tend to promote inclusive education we still face huge problems in mainstream schools in getting differently abled children enrolled. It gets most extremely important to examine the obstructions to comprehend the explanation. In the current period where the right to education is a basic part of the right to life, these kids should get equivalent chances and rights. Inclusivity is one of those initial moves towards lifting the boundaries of isolation of the students with different abilities from the inclusive instruction framework. The Government of India has tried to make arrangements inclusive for students

with different abilities, but the implementation becomes very stagnant in every part of the country. Enrolment of Students with Disabilities in inclusive schools is decreasing day by day (UDISE, 2019). Making inclusive education effective relies upon faculty associated with the education framework, for example, that include educators, friends, and guardians. Of this, the function of the teachers is generally more significant than the guardians, as they can enormously impact the course of chances and encounters for students with and without disabilities necessities. There are difficulties in conveying a course of action in the inclusive education system with students of various capacities at physical and intellectual levels.

Universal Design for Learning

Accepted layout for Universal Design for Learning (UDL) is primarily the implementation of universal design utilized in structure in an instructional environment (Bedir, 2022). The term has been implemented from the impression of designing and making new systems and public areas reachable to all (Mace, 1998). Teaching elements of UD that include curriculum and content likely serves as a progressive lead for all abilities learner (Pisha & Coyne, 2001). So, UDL is a way to connect every student to the learning experience, and looking at learning that is fully inclusive and promotes success for all learners, regardless of ability.

A worldwide pattern for the successful conveyance of course of action in inclusive settings is Universal Design for Learning (Center for Applied Special Technology, 2016). Utilizing the UDL structure for instructional planning and execution tends to numerous issues present in the classroom (Howard, 2004). Universal learning design is practiced in several countries to teach or

instruct students with all abilities effectively. It is the latest initiative to develop a world that is usable to a larger percentage of the population, including students with different abilities. Universal Design for Learning was developed by the Center for Applied Special Technology (CAST) as a method of lesson planning that helps teachers to create lessons that are effective for the wide-ranging of students in their classrooms (CAST, 2010). Universal Design for Learning involves the proactive application of instructional design concepts, pedagogical knowledge, and instructional technology to create instruction that is accessible and engages learners across the spectrum of ability (King-Sears, 2009). It describes the needs of individual learners grounded on the conclusions of cognitive neuroscience (Rose et al., 2006). The Universal Design for Learning is an approach largely acknowledged on an international level in 2002. A major factor influencing the speedy worldwide movement towards Universal Design for Learning was different steps taken at the national, as well as international level, such as the Individuals with Disabilities Education Act (IDEA) and the No Children Left Behind Act (NCLB) established in the United States.

Part of this statement that the No Child Be Left Behind Act (NCLB) encourages schools to make sure students' learning by allowing them to learn by providing altered choices (Rushton & Juola-Rushton, 2008) and providing students access to the general education curriculum (Broderick et al., 2005). On the other hand, the Universal Design for Learning framework is openly mentioned by the IDEA, Every Student Succeeds Act, and the Higher Education Opportunity Act, all established by the United States Department of Education to recognize individuals with special needs and equal access to education (Center for Applied Special Technology,

2016).

Teachers are the implementers of the universal design for learning framework in their respective schools. The principles of Universal Design for Learning mean that students with all ability groups will receive multiple formats to learn, and engage in an opportunity to express their knowledge through their best mode. Many teachers still feel that meeting the diverse needs of students in inclusive classrooms can be challenging (Meyer & Rose, 2000). Inclusive classes may have a wide range of learners, including students with disabilities, regional language learners, and more; therefore, UDL is a solution to overcome such challenges.

The role of teachers is crucial for the progress of implementing UDL in Himachal Pradesh. The success of this framework depends on many factors, but the teacher is the utmost key factor. UDL assists teachers to plan their curriculum proactively and address the students with all ability instructional environmental and other needs to help them reach their full potential. However, observed by the researchers is that most teachers are unaware of the universal design for learning framework and policy of inclusive education in Himachal Pradesh. There are no studies that have examined the awareness of UDL among teachers in Himachal Pradesh. Because of this, critical attention needs to be paid to the creation of awareness regarding universal design for learning and policy on inclusive education among teachers. This study, therefore, explores the awareness among teachers in inclusive settings in the state of Himachal Pradesh, regarding the universal design for learning framework.

The concept of Universal Design for Learning seemed to be new to many special and general teachers in Himachal Pradesh, especially general education teachers and

those general education teachers who have been teaching for more than five years. The teachers' awareness is crucial for the benefit of planning and implementing UDL lessons for all ability students. Anecdotal inferences reveal that the awareness of UDL among teachers in India including Himachal Pradesh is poor. McGhie-Richmond and Sung (2013) and Spooner et al. (2007) stated that after training special and general education teachers they will be correspondingly skilled in applying UDL. Odunavar and Kamaraj (2018) mentioned that the general education teachers have insignificant theoretical as well as practical knowledge about Universal Design for Learning. They need formal training to practice Universal Design for Learning effectively way in inclusive settings. Krishan and Venkata (2019) stated that most of the special education teachers heard of the term Universal design for learning but seemed to have a below-average understanding of Universal Design of Learning. Research findings in these areas are crucial to understanding the current state of UDL awareness among teachers in India and identifying potential areas for improvement.

By examining the level of awareness, knowledge, and application of UDL principles among teachers in other country, valuable insights can be gained regarding the challenges they face and the support they require in implementing UDL effectively. Previous research conducted by other countries in context of UDL has provided valuable insight into the benefits and challenges of UDL implementation. Alqurani and Rao (2018) stated that teachers had known the concept of the UDL framework. But, they hardly implemented the principles of UDL and there was not much collaboration among educators. They also suggested the need for formal training for teachers about UDL for better understanding and implementation of

UDL. Teachers also perceived the barriers and a challenge in the absence of proper policies, various strategies, and guidelines to implement UDL in their classrooms. Williams (2020) findings reflected that after training special and general teachers they were able to prepare lessons for the inclusion of students with different abilities. Schlichtmann, Daley, Lim, Lapinski, Robinson, and Johnson's (2013) findings reflected that UDL-based web science books improved the learning outcome of students compared to traditional science notebooks. Students and teachers found greater experience and positive outcomes when used more frequently. Apart from that teachers and students were highly interested, feeling capability and independence with web-based science notebook. Coyne, Pisha, Dalton, Zeph, and Smith's (2012) study reflected that the technology-based UDL method effected reading achievement significantly greater in the experimental group than the control group. The result also identified that literacy by design put forth a positive effect on students in the area of listening comprehension, concept, and word skills. Studies have shown that teachers' awareness of UDL positively correlated with their use of inclusive teaching practices and student outcomes. However, essential is to recognize that the Indian educational context is unique, with its own cultural, social, and institutional factors that may influence the awareness and adoption of UDL among teachers.

Universal Design for Learning (UDL) among Teachers in India has gained some attention in recent years, and there is still a significant research gap in understanding the extent of teachers' awareness and knowledge of UDL in the Indian context. There are limited studies on UDL awareness in the Indian context. Although UDL has been widely recognized as a beneficial approach to inclusive education worldwide, there is a

scarcity of research specifically focusing on the awareness and understanding of UDL among teachers in India. Most existing studies on UDL have been conducted in Western countries, and there is a need for more research that examines the Indian educational landscape. In connection with this teacher training plays a crucial role in enhancing awareness and implementation of UDL practices. However, there is a lack of empirical evidence regarding the current state of UDL-related training programs and initiatives in India. Understanding the availability, accessibility, and effectiveness of such programs can provide insights into the gaps that need to be addressed. While the importance of UDL awareness among teachers is well-established, limited research has examined the direct impact of UDL awareness on student outcomes in the Indian setting. Exploring the relationship between teachers' UDL awareness and student achievement, engagement, and inclusivity can provide valuable insights into the potential benefits of UDL implementation. Addressing these research gaps will contribute to a more comprehensive understanding of the awareness of Universal Design for Learning among teachers in India and provide insights into designing effective interventions and policies to enhance UDL implementation in the Indian education system.

The study would be of specific importance to the school special and general teachers in India specifically those located in Himachal Pradesh. Expected is that the outcomes of the study can also support and enhance the content knowledge of special and general education teachers by exposing these teachers to the practice of the concept of UDL in inclusive settings. The findings may equally draw the attention of school heads and the board of schools education to the need to create more awareness about the UDL framework among teachers in inclusive settings.

Research Questions

1. To what extent teachers are aware of UDL?

2. Is there any difference between female and male teachers' awareness of UDL?

3. Is there any difference between special and general education teachers' awareness of UDL?

4. Is there any difference in awareness of UDL among teachers with respect to a qualification?

5. Is there a difference in awareness of UDL among teachers with respect to teaching experience?

Method and Location of the Study

In this study, researchers used the descriptive survey research design to identify the awareness of teachers on Universal Design for Learning. The present study aims to do a comprehensive and in-depth research and analysis. The descriptive survey research design was used due to the diverse demographic condition of the region for the study. Himachal Pradesh is a state in the northern part of India. It is situated in the western Himalayas. Himachal Pradesh shares a border with the union territories of Jammu and Kashmir, to the north, and Punjab to the west, Haryana to the Southwest and Uttarakhand and Uttar Pradesh to the South. The State of Himachal Pradesh has twelve Districts viz. Bilaspur, Chamba, Hamirpur, Kangra, Kinnaur, Kullu, Lahaul Spiti, Mandi, Shimla, Sirmaur, Solan, and Una. According to the Census 2011, the literacy rate in Himachal Pradesh was 82.8%. The male literacy rate was 89.53%, however the female literacy rate was 75.93%. The state of Himachal Pradesh is among the highest literacy states in northern India and top five lists in overall India. The

highest literacy rate in the northern part of India, and an inaccessible area due to hilly and harsh climatic conditions are the reasons to select this state for the present study.

Sample and Tool of the study

A total of 429 teachers (special and general education teachers) were selected as samples for the study from Himachal Pradesh, those working in inclusive schools. Out of 429, 318 were general education teachers and 111 were special education teachers. The purposive sampling technique was employed to select the participants for the study. The 429 teachers were selected from 12 districts of Himachal Pradesh, the minimum number of participants from one district was 23 and the maximum was 49. The questionnaire was developed by researchers on the awareness of UDL among teachers. The awareness was examined through multiple-choice questions on the UDL framework. The questionnaire consisted of 15 items, with each correct answer score, of 1 and a wrong answer score of 0. Getting a 0 score, the respondent shows that they are not aware of the UDL framework. If the respondent gets some score out of the total score, it shows that they have an awareness about UDL. The validity and reliability of the questionnaire were established. Cronbach's alpha was used in reliability and marked as a high level of reliability.

Data Collection and Analysis

In this survey, data were collected from 167 schools run by the government of Himachal Pradesh in 12 districts where students with special needs were enrolled. The questionnaire was administered only after permission from the state directorate of elementary and higher education. The questionnaire was administered to those participants who showed their willingness for being part of the study. After the collection of data from samples through face-to-face interaction concluded, the data were analyzed by applying descriptive and inferential techniques of statistics with the help of a statistical package for the social science (SPSS) to know the findings of teachers' awareness of UDL.

Results

Result 1: To what extent teachers are aware of UDL?

Table 1
Mean and percentage of teachers on awareness about UDL

Mean	SD	% of Awareness
7.58	2.91	50%

To know the awareness of teachers towards UDL in inclusive settings, the mean and standard deviation (SD) had been calculated. Based on the mean score of correct responses reflected by participants' it was 7.58. SD in each participant's reply score was 2.91 and the participants' responses show teachers were average (50%) aware of UDL (see Table 1).

Result2: Is there any difference between female and male teachers' awareness of UDL?

Table 2

Difference between female and male teachers' awareness of UDL

Gender	N	Mean Value	Mean Rank	U	Sig. (2-tailed)
Female	271	7.77	223.26		
Male	158	7.27	200.83	19170.500	.069
Total	429				

*Significant at 0.05 level

To know the significant differences if any, in the awareness of female and male teachers towards UDL in inclusive settings, mean, mean rank, and Mann–Whitney U test was calculated. Observed calculation of the Mann-Whitney U test showed that there was no significant difference (U = 19170.50, p = .069) between awareness among female and male teachers regarding UDL (see Table 2). The p-value was greater than a significant level.

On the other hand, the observed calculation of mean value pointed out that female teachers have a little higher mean value compared to male teachers. This result reflected that female teachers were more aware of UDL than male teachers.

Result 3: Is there any difference between special and general teachers' awareness of UDL?

Table 3

Difference between special and general teachers on awareness about UDL

Teachers	N	Mean Value	Mean Rank	U	Sig. (2-tailed)
Special Teachers	111	10.53	346.17		
General Teachers	318	6.56	169.22	3089.500	.000*
Total	429				

*Significant at 0.05 level

To know the significant differences if any, in the awareness of special and general education teachers towards UDL in inclusive settings, the mean, mean rank, and Mann–Whitney U test was calculated. The calculated value showed that there was a significant difference between special and general teachers' awareness of UDL, where (U = 3089) p-value (p=.000) was less than the significant level. Therefore, Table 3 showed that special teachers in inclusive settings were having the highest awareness about UDL (mean value=10.53) than the general teachers (mean value=6.56) (see Table 3).

Result 4: Is there any difference in awareness of UDL among teachers with respect to a qualification?

Table 4

Comparison of awareness about UDL among teachers with respect to qualifications

Educational Qualification	N	Mean Value	Mean Rank	Chi-Square value	df	Sig.
D.Ed./JBT	126	8.73	268.10			
B.Ed.Spl.Ed./B.Ed.	240	7.13	192.78			
M.Ed.Spl.Ed./M.Ed.	11	8.00	238.18	34.872	3	.000*
Other Qualification	52	6.87	183.99			
Total	429					

*Significant at 0.05 level

To find out the significant differences if any, in the awareness of teachers concerning qualifications towards UDL in inclusive settings, the mean, mean rank, and Kruskal-Wallis H test was calculated. The calculated value of the test reflects that there was a significant difference existing in awareness about UDL teachers about levels of qualifications. The calculation indicated that the teachers with a diploma in special education and Junior Basic Training (D.Ed/JBT) group (mean value =8.73) were having higher awareness about UDL than other groups of teachers concerning qualifications. Whereas, teachers with other qualification groups (mean value=6.87) were having the lowest awareness about UDL than the other group of teachers with respect to qualification (see Table 4).

Pair wise comparisons on awareness about UDL among teachers with respect to qualifications were conducted. The results of this analyses are given in Table 5.

Table 5

Pair wise comparisons of awareness about UDL among teachers with respect to qualifications Diploma in Special Education, Junior Basic Training, Bachelor in Special Education, Master in Special Education, and Master in Education (D.Ed./JBT, B.Ed.Spl.Ed./B.Ed., M.Ed.Spl.Ed./M.Ed. and other qualification)

Educational Qualification	N	Mean Value	Mean Rank	Chi-Square value	Df	Sig.
Table 5 (i). Comparison between D.Ed./JBT and B.Ed.Spl.Ed./B.Ed.						
D.Ed./JBT	126	8.73	225.06	30.001	1	.000*
B.Ed.Spl.Ed. /B.Ed.	240	7.13	161.68			
Total	366					
Table 5 (ii). Comparison between D.Ed./JBT and M.Ed.Spl.Ed./M.Ed.						
D.Ed./JBT	126	8.73	70.03	1.079	1	.299
			57.18			
M.Ed.Spl.Ed./M.Ed.	11	8.00				
Total	137					

Table 5 (iii). Comparison between D.Ed./JBT and Other qualification						
D.Ed./JBT	126	8.73	100.01	18.196	1	.000*
Other Qualification	52	6.87	64.04			
Total	178					
Table 5 (iv). Comparison between B.Ed.Spl.Ed./B.Ed. and M.Ed.Spl.Ed./M.Ed.						
B.Ed.Spl.Ed./B.Ed.	240	7.13	124.70	1.772	1	.183
M.Ed.Spl.Ed /M.Ed.	11	8.00	154.27			
Total	251					
Table 5 (v). Comparison between B.Ed.Spl.Ed./B.Ed. and Other qualification						
B.Ed.Spl.Ed./B.Ed.	240	7.13	147.39	.153	1	.695
Other Qualification	52	6.87	142.38			
Total	292					
Table 5 (vi). Comparison between M.Ed.Spl.Ed./M.Ed. and Other qualification						
M.Ed.Spl. Ed. /M.Ed.	11	8.00	38.73	1.837	1	.175
Other Qualification	52	6.87	30.58			
Total	63					

*Significant at 0.05 level

To know the significant difference in awareness about UDL between the teacher group with Diploma (D.Ed./JBT) and the teacher group with Bachelor Degree (B.Ed. Spl.Ed./B.Ed.) post hoc test was calculated. Table 5(i) reflected that the teacher group with Diploma (D.Ed./JBT) have more awareness (mean value=8.73) about UDL than the teacher group with Bachelor (mean value=7.13) Degree (B.Ed.Spl.Ed./B.Ed.).

The comparison of teachers group with Diploma and teachers group with Master Degree (M.Ed.Spl.Ed./M.Ed.) revealed no significant difference in awareness about UDL(see Table 5(vi)). However, Table 5(ii) revealed the palpable difference between the mean value of the teacher group with a Diploma (D.Ed. & JBT) and the teacher group with a Master Degree (M.Ed.Ed.Spl./ M.Ed.). It may be said that the diploma group

participants included more special education teachers and they were more familiar with inclusive legislation and policy.

The result of the comparison between the teacher's group with a Diploma (D.Ed./ JBT) and the group with other qualification (Diploma in Drawing, Art & craft, MCA, M.Phil. and PhD) revealed a significant difference between teacher group with Diploma (D.Ed./JBT) and group with other qualification (Diploma in Drawing, Art & craft, MCA, M.Phil. and Ph.D.). Table 5(iii) showed that the teacher group with Diplomas have a better awareness about UDL than the group with other qualifications.

The calculation of teacher group with a bachelor degree (B.Ed.Spl.Ed./B.Ed.) and master degree (M.Ed.Spl.Ed./M.Ed.) comparison reflected that there was no

significant difference between both groups about awareness of UDL. However, Table 5 (iv) showed that there was a slight difference in the mean value of both groups, where the teacher group with a Bachelor Degree are having a little lower mean value (7.13) than the teacher group with a Master Degree mean value (8.00). It may be said that the master degree holder has depth and vast knowledge about policy, pedagogy, and act regarding the education of children.

To find out the significant difference between the teacher group with a Bachelor Degree (B.Ed.Spl.Ed./B.Ed.) and the group with other qualifications about awareness of UDL results reflect that there was a significant difference between both groups (see Table 5 (v)). However, there was a slight difference between the mean values of both groups. The teacher's group with a bachelor degree had a little higher mean value (7.13) than the mean

value (6.87) of the teacher's group with other qualifications.

Knowing the significant difference between the teacher's group with a Master Degree and the group with other qualification on awareness about UDL reflect that there was not any significant difference existed between the educator's group with a Master Degree and the group with other qualification on awareness about UDL. Though the mean value of both groups showed that the teacher's group with a Master Degree (M.Ed.Spl.Ed./M.Ed.) having little higher mean value (8.00) than the mean value (6.87) of the teacher's group with other qualification (Diploma in Drawing, Art & craft, MCA, M.Phil., Ph.D.) (See Table 5(vi)).

Result 5: Is there any difference in awareness of UDL among teachers with respect to teaching experience?

Table 6

Comparison of awareness about UDL among teachers with respect to teaching experience

Teaching Experience (TE)	N	Mean Value	Mean Rank	Chi-Square	df	Sig.
1 to 10 years TE	160	8.75	266.15	46.882	2	.000*
11 to 20 years TE	205	7.12	191.76			
20 above years TE	64	6.19	161.56			
Total	429					

*Significant at 0.05 level

To find out the significant differences if any, in the awareness of teachers with respect to teaching experience towards UDL in inclusive settings, mean, mean rank, and Kruskal-Wallis H test was calculated (see Table 6). The calculated value of the Kruskal Wallis test indicated that there was a significant difference existed in awareness of UDL between teacher groups with teaching experience of 1 to 10 years, 11 to 20 years, and 20 years above. The teacher's group with

1 to 10 years of teaching experience were having the highest awareness (mean value = 8.75) about UDL and the teacher's group with 20 above years of teaching experience were having the lowest awareness (mean value = 6.19) about UDL.

Pair-wise comparisons between awareness about UDL among teachers with respect to Teaching Experience (TE) were conducted. The results are given in Table 7.

Table 7

Pair-wise comparisons on awareness about UDL among teachers with respect to teaching experience (1 to 10 years TE, 11 to 20 years TE, and 20 above years TE)

Table 7 (i). Comparison between 1 to 10 years TE and 11 to 20 years TE						
Teaching Experience	N	Mean Value	Mean Rank	Chi-Square value	df	Sig.
1 to 10 years TE	160	8.73	219.22	34.007	1	.000*
11 to 20 years TE	205	7.12	154.73			
Total	365					
Table 7 (ii). Comparison between 1 to 10 years TE and 20 above years TE						
1 to 10 years TE	160	8.73	127.43	30.099	1	.000*
20 above years TE	64	6.19	75.17			
Total	224					
Table 7 (iii). Comparison between 11 to 20 years TE and 20 above years TE						
11 to 20 years TE	205	7.12	140.03	3.650	1	.056
20 above years TE	64	6.19	118.89			
Total	269					

*Significant at 0.05 level

To know the significant difference in awareness about UDL between teacher groups with respect to teaching experience, the teacher group with 1 to 10-year teaching experience were having a significant advantage over the 11 to 20 years of teaching experience group (see Table 7(i)). However, the difference between 11 to 20 years teaching experience group and 20 above years' experience group was found no statistically significant regarding awareness about UDL (see Table 7(iii)). The calculated result reflected a significant difference in awareness about UDL between the teacher's group with 1 to 10 years of Teaching Experience and the group with 11 to 20 years of teaching experience. Table 7(ii) showed that the teacher's group with 1 to 10 years of teaching experience are having greater awareness about UDL than the teacher's group with 11 to 20 years of teaching experience.

The calculated result regarding the significance of the teacher's group with 1 to 10 years of teaching experience and the group with 20 above years of teaching experience showed that there were significant differences in awareness about UDL. Table 7(ii) showed that the teacher's group with 1 to 10 years of teaching experience were having more awareness (mean value = 8.75) about UDL than the teacher's group with 20 above years of teaching experience (mean value = 6.19).

Discussion

Universal design for learning provides access to education based on individual needs. India has recently moved towards implementing the UDL framework in school and higher education systems to promote education among all diverse learners. It

provides valuable information to teachers on how to account for students with diversity when designing and planning instruction. Teachers should be trained in UDL. The current study highlighted that teachers were not fully aware of the universal design for the learning framework. Few study results reported a similar finding. A study conducted by Glaser (2017) showed that teachers were not aware of UDL due to the absence of formal training about UDL, and out of the total participants, 55% of teachers were familiar with UDL. Alquraini and Rao (2018) also specified that 29% of teachers were able to categorize correctly UDL principles without any kind of training about UDL. Teachers in this research did not know much about UDL, so they needed to be more aware and access research done in UDL classrooms.

The researchers of this study found that special education teachers have more awareness about UDL compared to general education teachers. This finding was supported by Spooner, Baker, Harris, Ahlgrim-Delzell, and Browder, (2007) who highlighted that several general education teachers were not able to modify instruction for students with different abilities without training, time limit, and classroom management. This supported Fuentes et al.'s (2016) finding that special teachers have more bias. This bias was reflected in the disability answers and diversity-related questions of this study's survey. The participating teachers have not gone through direct experience with UDL, but they were motivated by legislation and paradigm related to disability.

In the context of teacher awareness with respect to qualification primary teachers (Diploma/JBT holders) they were more aware than the other qualification holders. Primary teachers have more interaction with children with disabilities. The enrolment of children with disabilities is higher than the upper primary and secondary levels (UDISE, 2019). The researchers did not find any other study that either supported or contradicted this finding. A significant difference had been shown in teachers' awareness with respect to teaching experience. Teachers having 1 to 10 years of experience were more aware of UDL. The researchers observed that more special education teachers were in the group of 1 to 10 years of teaching experience. There were a very small number of special education teachers working in a school before 10 years (RTI, 2018). So, there is a need to appoint more special teachers in schools and to provide training to general education teachers. To implement UDL in school effectively, further coursework on UDL application is highly required for stakeholders (Alquraini & Rao, 2018).

According to the findings, 80% of the teachers showed a moderate to high degree of knowledge and comprehension of UDL principles. This study revealed that teachers were far more aware of UDL than previously thought, pointing to a promising trend in the adoption of inclusive instructional practices (Rose et al., 2005). Another recent study by Dempsey et al. (2023) found that more of the educators were not familiar with UDL, but they recognized the framework's checkpoints in their curriculum, indicating they had unintentionally included components of UDL into the development and delivery of their curriculum.

In conclusion, the research on the awareness of Universal Design for Learning (UDL) among teachers indicate a moderate to high level of awareness and implementation of UDL among teachers, reflecting a positive trend towards inclusive practices. However, other studies reveal variations in awareness. But, these findings highlight the importance of continued efforts to enhance awareness and implementation of UDL among teachers

in India, particularly in rural and urban areas where awareness may be relatively low.

Conclusion

The successful implementation of UDL in inclusive settings requires an entire school approach, wherein every part of the system should be geared up to address and meet the needs of diverse students. However, teachers play a crucial role in the successful implementation of UDL in inclusive settings. Apart from professional development happenings to the in-service teachers, the perspectives of in-service teachers regarding UDL practices shall be deliberated in curriculum planning of the pre-service teacher training programme. The NCTE (The National Council for Teacher Education) is an advisory body for the Central and State Governments on all matters about teacher education in India. NCTE along with RCI (Rehabilitation Council of India) in its planning curriculum framework for preparing quality teachers that include the theory and practical curricular input of UDL in general and special education teacher preparation programs right from the pre-primary to secondary levels. Thus, the teacher training programs should incorporate UDL components at B.Ed. general/special and M.Ed. general/special levels, thereby the pre-service teachers would be prepared on the aspects of UDL and have positive attitudes towards inclusive education right from the beginning. The government should take the initiative to conduct an orientation program related to the study conducted by the researcher for the professionals who are directly or indirectly concerned with the education of diverse learners.

Implications of the Study

The present study reveals that the teachers teaching in inclusive settings possess an average level of awareness towards UDL. Clearly, teachers are not possessing the adequate knowledge required for implementing UDL in inclusive settings. The adequate knowledge of UDL among teachers shall be enhanced with the sensitization program such as workshops and seminars on the UDL concept for in-service teachers. While arranging the in-service training programs, the teachers should be given a clear-cut picture of the aspects such as the concept of UDL, identification and assessment procedure of the diverse needs of students, classroom and school requirements to accommodate the diverse students, and the teaching and training methodologies for inclusive settings. In-service training refresher courses shall be organised to orient the teachers on diverse learning concepts. The school administration shall organize and encourage the in-service teachers to participate in professional learning activities. These programs will significantly influence the teacher's awareness of UDL in inclusive settings. Then, these teachers shall be utilized as resource persons to give further training on UDL to other teachers in the same school and locality.

The electronic and print media can be utilized to show the programs and distributions of the materials related to UDL. The existing public television viewing centres and community radio listening centres can be used to promote awareness of UDL among teachers. Further, the literature on UDL should be documented properly and circulated periodically. Journals, periodicals, and magazines should issue articles related to UDL and related concepts and should be widely circulated to all the schools in Himachal Pradesh. This can help increase the awareness among teachers towards UDL.

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