Research Article

Technology Enabled Capacity Building for Teachers in Inclusive Evaluation: UDL Best Practice

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Abstract

As we all know, Universal Design for Learning (UDL) is an approach to teaching and learning that gives all students an equal opportunity to succeed. The present study is an experimental attempt to examine the significance of Universal Design for Learning (UDL) principles in inclusive evaluation. To strengthen the difficulties faced by the teachers in inclusive evaluation, the investigator adopted the purposive sampling method in the study entitled "Technology Enabled Capacity Building for Teachers in Inclusive Evaluation: UDL Best Practice." This sampling technique can be effective in exploring anthropological situations where the discovery of meaning can benefit from an intuitive approach. Thirty-two participants of the research were chosen from Noida, U.P government, and non-government schools. Out of these, 15 were male teachers and 17 were female teachers who were made into two groups; the same participants were divided by qualification; 15 teachers were qualified with undergraduate, and the remaining 17 were post-graduate teachers. 16 teachers were employed in government schools, and the other half of teachers (16) were working in non-government schools. The independent variables of the study were teachers' gender, qualification and school of employment. A quasi-experimental design was adopted for the research; there was no control group. The main aim of the study is to analyze the challenges of teachers in the technology-incorporated evaluation process and build digital capacity with the help of Universal Design for Learning (UDL) principles to create an equitable, inclusive learning environment.

Keywords: Teacher competency, Inclusive Education, Technology Enablement, UDL, Capacity Building, and Digital Evaluation.

Introduction

The modern curriculum focuses on student-centric teaching and learning. Many Western countries are providing self-paced learning for their students. This millennium is evidencing great transformation from the ancient teaching method, which was teacher-centric bureaucratese. The technology ensures a global standard in education as reflected in the digital curriculum. As we all know, Universal Design for Learning (UDL) is an approach to teaching and learning that gives all students an equal opportunity to succeed. In short, Universal Design for Learning (UDL) helps in the creation of an inclusive teaching-learning environment. In CAST's Universal Design for Learning: Theory and Practice, assessment is defined as "the process of

gathering information about a learner's performance to make educational decisions" (*Salvia* & *Ysseldyke,* 2009). Sustainable Developmental Goals (SDG) 2040 highlights inclusive education; many Acts and policies are supported, including the Rights for Persons with Disabilities (RPwD) Act 2016, National Educational Policy (NEP) 2020. It is high time for educational institutions to look into digital evaluation processes to access inclusive student performance. Several studies focused on digital evaluation in the Western context but, not in the Indian context. While adopting the Western system, teachers of our nation need to be properly trained to meet the challenges. In this context, the present study aims to analyze the challenges of teachers in technology incorporated evaluation process and build digital capacity with the help of Universal Design for Learning (UDL) principles to create an equitable, inclusive learning environment.

Need for the Study

Technology brings the world under one roof; we can learn anything with a finger touch. It laid the foundation for globalization. Thus, globalization in education brings enormous changes to the Indian education system. Our education system is ancient and has a long-rooted history, which is bound by traditional methods of teaching and learning. Great thinkers and philosophers are evident in this traditional curriculum. Westernization of Education seeds the modern curriculum by adopting the traditional method of teaching and learning is also often referred to as the learner-centric method. This leads to technology-enabled classrooms and teachers are trained. Universal Design for Learning (UDL) helps in the creation of inclusive teaching-learning environments in both offline (classroom) and online teaching. During the COVID-19 pandemic situation, online teaching and learning succussed because of this technology enablement in school and higher education, including the research community. It is high time for India, like developing countries, to enable technology in the evaluation process as developed countries. This study mainly aims to build digital competency among inclusive teachers to enable them in the technology-based evaluation process from the primary level itself by scaffolding Universal Design for Learning (UDL) principles.

Objectives of the Study

The following are the major objectives of the experimental study.

- To measure the inclusive teachers' competency in technology-enabled evaluation
- To develop appropriate material to access the inclusive teachers' competency in the digital evaluation.
- To compare the inclusive teachers' competency in digital evaluation based on gender, qualification and type of school they were employed.
- To build digital competency among inclusive teachers to enable them in the technology-based evaluation process by scaffolding Universal Design for Learning (UDL) principles.
- To compare the teachers' digital competency in the pre-test and post-test phases.
- To provide need-based training for teachers on digital evaluation for the fruitful inclusion concept by incorporating Universal Design for Learning (UDL) principles.

Hypothesis of the Study

The null hypothesis framed for the testing of objectives is as follows:

1. There is no significant difference in the teachers' capacity for inclusive evaluation in pre-test and post-test, according to gender.

2. There is no significant difference in the teachers' capacity for inclusive evaluation in pre-test and post-test, according to qualification.

3. There is no significant difference in the teachers' capacity for inclusive evaluation in pre-test and post-test, according to the school.

Review of Literature

Liyan Feng and team 2013 examined the effectiveness of electronic evaluation in 53 schools in Kaohsiung City, Taiwan. They found that 50 per cent of the schools are using digital portfolios for evaluation. A total of 56.10 per cent of the teacher participants of the study reported high professional growth activities. In their study, Fatma Cumhur and Sefika Sumeyye Cam 2021 explored the digital transformation in the assessment and evaluation process with 52 student teachers in the faculty of education in Turkey. A mixed method research design is followed for the study through quasi-experiment. The result reveals that digitalized evaluation is effective and accurate. Similarly, Nonmanut Pongsakdi, Arto Kortelaninen, and Marjaana Veermans (2021) aimed to explore the Enhancement of the skills of teachers in digital assessment tools. About 98 teachers are chosen for the study from Finland. The results of the study highlight that teachers' digital skills depend on their ICT confidence level.

Materials and Methods

Method: Quasi-experimental design is followed for the present study. The participants of the study were chosen by purposive sampling method. The study is new to the Indian context, thus, the researcher chose the purposive sampling method. This sampling technique can be effective in exploring anthropological situations where the discovery of meaning can benefit from an intuitive approach.

Sample: The 32 teachers from various regions of Noida, UP, were identified from the out-reach data record of SASR India, Faridabad, Haryana, as part of Community Promotional Activities. Out of these, 15 male teachers and 17 female teachers were made into two groups; the same participants were divided by qualification; 15 teachers were qualified with undergraduate, and the remaining 17 were post-graduate teachers. 16 teachers were employed in government schools, and the other half of teachers (16) were working in non-government schools. The ethical clearance was also sought for the study.

Material

i. Universal Design for Learning-Digital Evaluation (UDL-DE) Tool.

ii. Universal Design for Learning-Digital Evaluation Training (UDL-DET).

Description

A checklist was prepared with close-ended questions developed by the investigators and was named as Universal Design For Learning- Digital Evaluation (UDL-DE) Tool. The UDL-DE tool has three components i) accountability, ii) student progress, and iii) instruction. These were prepared based on Universal Design for Learning principles; multiple means of engagement, multiple means of action and expression, and multiple means of representation. This UDL-DE tool is administrated to the teachers in the pre-test and post-test phases. The chosen independent variables of the study are teachers' gender, qualification,

and school of employment. A quasi-experimental design is adopted for the research; there is no control group. UDL-enabled digital training, named as Universal Design for Learning- Digital Evaluation Training (UDL-DET), is given to the teachers to build digital competency in the inclusive evaluation process. The data collected from the teachers in the pre-test and post-test phases were recorded. Statistical techniques were applied, and the results of the analyzed data were tabulated and presented in a pictorial form.

Limitations of the Study

- The sample of the study is small size. The purposive sampling method limits the participation of the other teachers.
- In quasi-experimental design, participants are not randomized to the intervention named UDL-DET. Thus, this method may lead to systematic biases and influence the group membership. So, further research can be carried out with a true experimental method with control groups.
- The study focused only government, and non-government schools of Noida, U.P.
- Special school teachers are excluded from the study.
- The teachers who were unwilling to participate in the pre-test and the post-test phases were not included in the study.

Result and Discussion

The demography of the teachers is given in Table no: 1 with numbers and percentages.

Table-1: Distribution of Participants with Number and Percentage

S.No	Area	Level	Number	Percentage
1.	Gender	Male	15	47%
		Female	17	53%
2.	Qualification	Under-Graduate	15	47%
		Post-Graduate	17	53%
3.	School	Government School	16	50%
		Non-Government School	16	50%

Figure-1: Distribution of Teachers Based on Gender

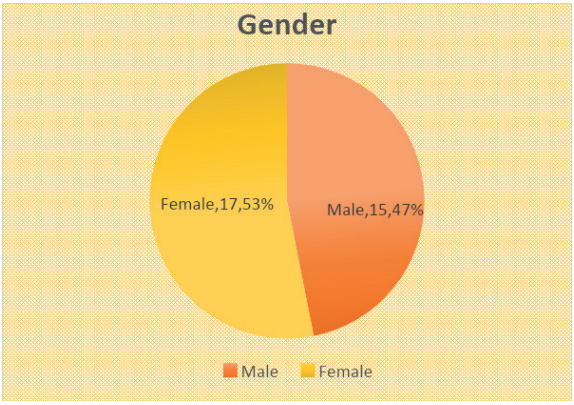


Figure-2: Distribution of Teachers Based on Qualification

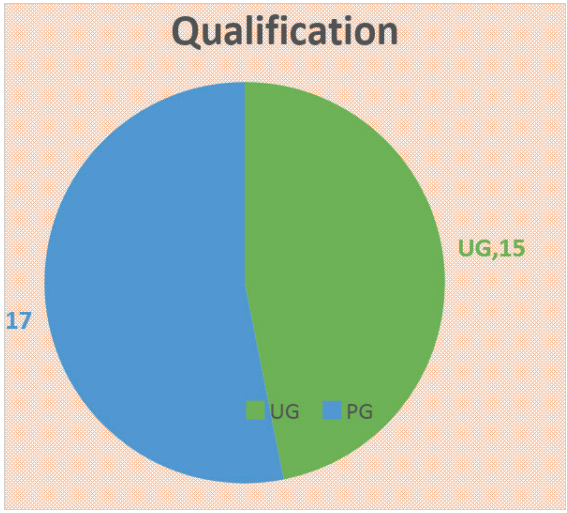


Figure-3: Distribution of Teachers Based on Schools

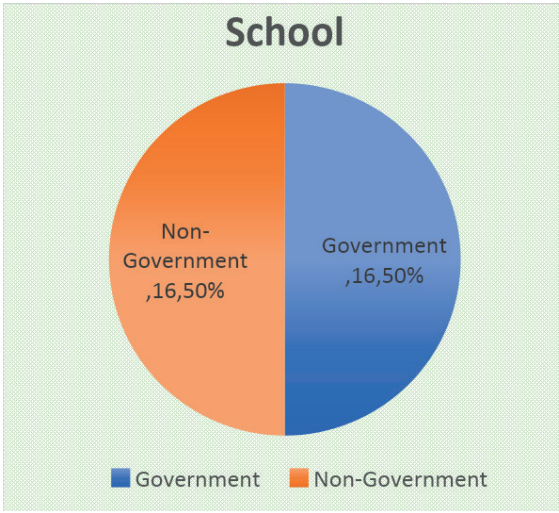


Table-2: Pre-test and Post-test Scores of Teachers in Technology-enabled Inclusive Evaluation Based on Gender

Gender	N	Test	Mean	SD	t-test Significance	P-Value
Male	15	Pre-test	19.13	3.98	-3.42*	.000974
		Post-test	23.47	2.87		
Female	17	Pre-test	17.65	3.95	-3.24*	.001382
		Post-test	23.65	3.08		

*Significant at 0.05 level

Table no: 2 describes the male and female teachers' pre-test and posttest mean scores and SD with t-value in the technology-enabled inclusive evaluation. The male teacher's pre-test mean score was foubd to be 19.13 with 3.98 SD, whereas the female got 17.65 by administrating the UDL-DE tool. This difference shows that both male and female teachers have different levels of competency in digital evaluation. In the post-test, mean scores of males were 23.47, and for females it was 23.65. Female teachers made an extra effort in UDL-DET, which resulted in high post-test scores. The t-value of males was -3.42, and -3.24 for females which were significant at 0.05 level. Thus, the null hypothesis stated that, "there is no significance difference among the teachers' capacity on inclusive evaluation in pre-test and post-test according to gender," is rejected.

Figure-4: Gender-wise Scores of Teachers in Technology-enabled Inclusive Evaluation

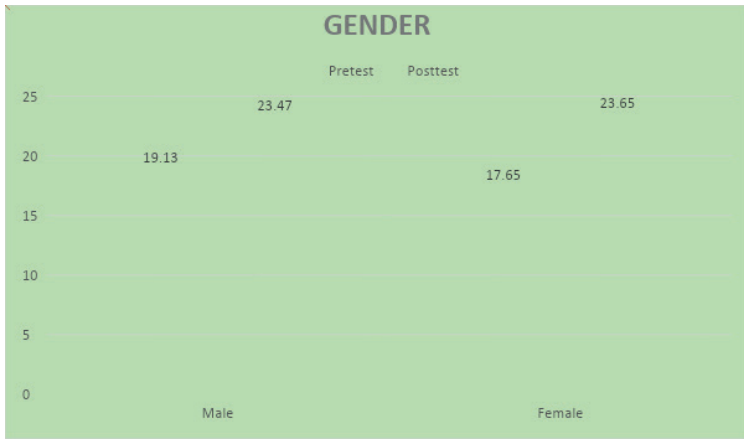


Table-3: Pre-test and Post-test Scores of Teachers in Technology-enabled Inclusive Evaluation Based on Qualification

Qualification	N	Test	Mean	SD	t-test Significance	P-Value
UG	15	Pre-test	17.03	3.79	-3.34*	.001179
		Post-test	21.53	3.52		
PG	17	Pre-test	19.47	3.89	-3.47*	.000756
		Post-test	23.65	3.08		

*Significant at 0.05 level

Table no: 3 presents the teachers' competency in the digital evaluation process based on UDL in the UDL-DE tool. For teachers with UG qualifications, the pre-test mean score is 17.03, and the post-test score is 21.53 with .001179 p-value; for teachers with PG qualifications, 19.47 is the pre-test score, and 23.65 is the post-test score. While analyzing the scores, teachers with PG qualifications got high scores in the pre-test and post-test phases; this may be due to the academic exposure gained as part of the Master's Degree program and the impact of UDL-DET. The pre-test t-vale was -3.34, and the

post-test value was -3.47. Both were significant. This significant reference of teachers with UG and PG qualifications made the investigator reject the null hypothesis: "There is no significant difference among the teacher's capacity on inclusive evaluation in pre-test and post-test according to qualification.

Figure-5: Qualification-wise Scores of Teachers in Technology-enabled Inclusive Evaluation

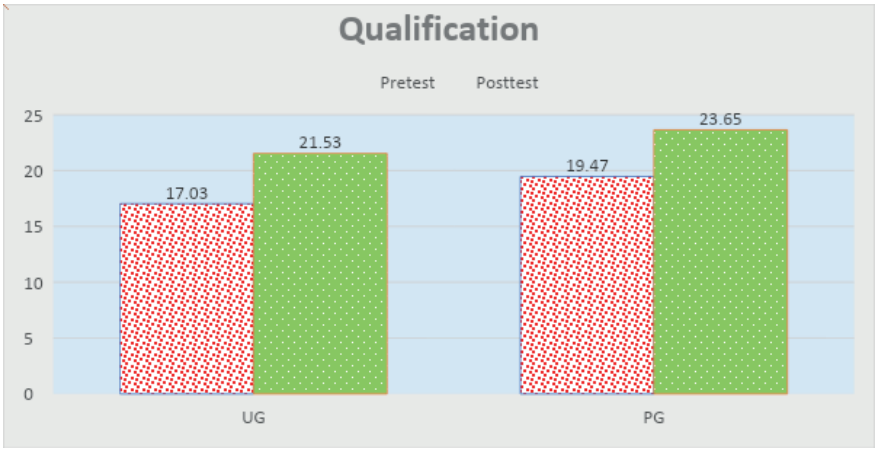


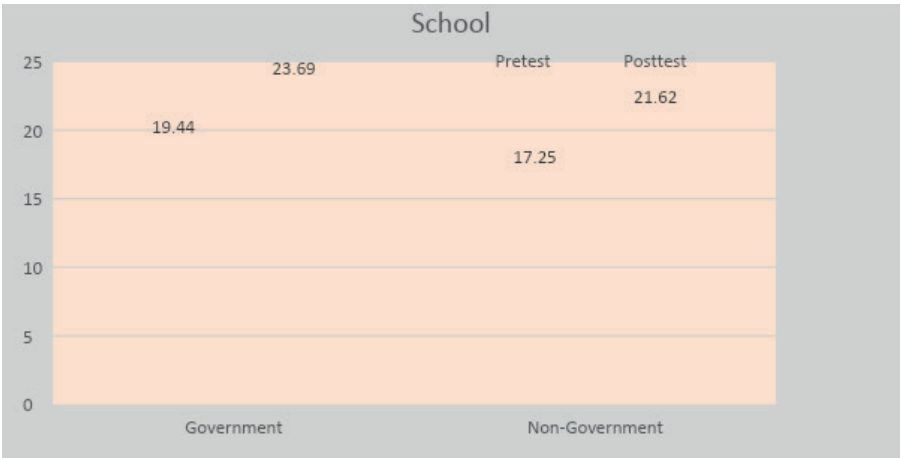
Table-4: Pre-test and Post-test Scores of Teachers in Technology-enabled Inclusive Evaluation Based on the Type of School

School	N	Test	Mean	SD	t-test Significance	P-Value
Government	16	Pre-test	19.44	4.02	-3.46*	.000813
		Post-test	23.69	2.82		
Non-Government	16	Pre-test	17.25	3.73	-3.32*	.001186
		Post-test	21.62	3.72		

*Significant at 0.05 level

Table No: 4 portrays the mean score and SD with t and p values of the teachers scored in the pre-test and post-test by UDL-DE Tool. The government school teachers' pre-test score is 19.44 for non-government school teachers 17.25 with 3.73 SD. The post-test scores are 23.69 for government school teachers with -3.46 t-value 21.62 for non-government school teachers with -3.32 t-value. Both the t-values were significant at 0.05 level. In both the pre-test and post-test phases, government school teachers performed high while compared to non-government school teachers. This shows that government school teachers have more opportunities for refresher and in-service training, whereas the opportunities are minimal for non-governmental school teachers. UDL-DET has a higher impact on government school teachers. Hence, the null hypothesis stated, "there is no significance difference among the teacher's capacity on inclusive evaluation in pre-test and post-test according to school," is rejected.

Figure-6: School-wise Scores of Teachers in Technology-enabled Inclusive Evaluation



Findings and Conclusion

In the participants' group, 47 per cent were male, and the remaining 53 per cent were female teachers from government and non-government schools of Noida, UP. 47 per cent of the teachers were qualified with under graduation, and 17 of them were with post-graduation, which means 53 per cent of the study were participants. 50 per cent of the teachers were employed in government schools of Noida and the remaining 16 teachers were from non-government schools. Several studies focused on digital evaluation in a Western context but, not in the Indian context. While adopting the Western system, teachers of our nation should be properly trained to meet the challenges. Male teachers' pre-test mean score was 19.13 with 3.98 SD, whereas females got 17.65 in UDL-DE Tool. This difference shows both male and female teachers have different levels of competency in digital evaluation. While planning the training program, the stakeholders should give some special focus on female teachers, in a post-test mean score of males 23.47 and females 23.65. Female teachers made an extra effort in UDL-DET, which resulted in higher post-test scores.

For teachers with UG qualifications pre-test mean score is 17.03, and the post-test score was 21.53 in the UDL-DE Tool assessment. .001179 p-value, for teachers with PG qualification also, 19.47 is the pre-test score, and 23.65 is the post-test score. While analyzing the scores, teachers with PG qualifications got high scores in the pre-test and post-test phases; this may be due to the academic exposure gained as part of the Master's Degree program. This shows that UDL-DET has a higher impact among teachers with PG qualifications. Bachelor's Degree programs should strengthen the curriculum with digital evaluation to prepare their teacher trainees to meet the challenges of technology-enabled inclusive evaluation. The government school teachers' pre-test score was 19.44 and for non-government school teachers 17.25 with 3.73 SD. The post-test scores were 23.69 for government school teachers with -3.46 t-value 21.62 for non-government school teachers with -3.32 t-value. Both the t-values were significant at 0.05 level. In both the pre-test and post-test phases, government school teachers performed highly as compared to non-government school teachers. This shows that government school teachers have more opportunities

for refresher and in-service training, whereas the opportunities are minimal for non-governmental school teachers. These training programs helped the government school teachers in UDL-DET. The non-government school teachers should also be provide with the same opportunities as government school teachers w.r.t the training programs. Marjaana Veermans (2021) also states that teachers' digital skills depend on their ICT confidence level. Thus, the study helped inclusive teachers to increase their digital competency through UDL-DET.

Suggestions

- Most research studies focused on digital evaluation in a Western context, not in the Indian context. While adopting a Western system of grading, teachers of our nation should be properly trained to meet the challenges.
- While planning the digital training program, the stakeholders should give some special focus and additional training to female teachers and teachers with disabilities.
- The digital training should incorporate Universal Design for Learning principles.
- Bachelor's Degree programs should strengthen the curriculum with digital evaluation to prepare their teacher trainees to meet the challenges in technology-enabled inclusive evaluation.
- Non-government school teachers should also be provided with the same opportunities as that of government school teachers w.r.t training programs like pre-service, in-service and refresher courses.
- The training should be practical rather than theoretical.
- The digital training can be in both the forms; off-line (center or institutional-based) and online with low cost or no cost.

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