European Journal of Inclusive Education (EJIE)
2025 Vol. 4, Issue 1,
https://doi.org/

Assessing the Impact of a 16-Day Professional Development Workshop on Inclusive Education in Bhutan.

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Abstract

Inclusive education is a cornerstone of equitable and quality learning, yet its effective implementation depends on the competency and preparedness of teachers. In Bhutan, although inclusive education has gained policy momentum, professional development for teachers has traditionally been limited to short-term, one-off workshops with no follow-up, which research shows have minimal sustained impact. This study examined the effect of a 16-day professional development workshop aimed at enhancing teachers' knowledge and skills in inclusive education and educational assessment. The workshop was conducted to 298 teachers from 44 inclusive schools across three training regions: Eastern, Central, and Western Bhutan. Using a quantitative pre- and post-intervention design, data were collected from 235 participants who completed structured survey questionnaires administered before and after the workshop. Data analysis using descriptive statistics and paired-sample t-tests revealed statistically significant improvements in both knowledge and skills. The workshop significantly increased teachers' mean knowledge scores from 1.97 (SD = 0.58) to 4.12 (SD = 0.48), and skill scores from 1.66 (SD = 0.57) to 3.89 (SD = 0.52). Large effect sizes (Cohen's d = 2.94 for knowledge; 2.92 for skills) demonstrate the strong impact of the extended, structured PD program. These findings suggest that well-structured PD initiatives can significantly strengthen teachers' knowledge and skills. However, the study also acknowledges limitations, including reliance on self-reported measures and the absence of longitudinal data. The results underscore the critical role of continuous, context-specific professional development in bridging the gap between inclusive education policy and classroom practice in Bhutan. For lasting and systemic change, PD must be ongoing, supported by institutional structures, and tailored to diverse teacher needs. Further research is recommended to explore the long-term effects of teacher PD on instructional practices and student outcomes in inclusive settings.

Keywords: Inclusive education, professional development, special education, teacher knowledge, teacher skills.

Points of Interest

- A 16-day professional development workshop significantly improved Bhutanese teachers' self-perceived knowledge and skills in inclusive education and educational assessment.
- The study found large effect sizes (Cohen's d > 2.90), indicating strong impact on teacher confidence and perceived competence.

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ISSN: 2794-4417
https://tidsskrift.dk/ejie

- Extended-duration PD allowed for deeper engagement and reflective practice, addressing long-standing gaps in teacher training.
- The research highlights the need for ongoing, collaborative PD supported by systemic structures such as leadership involvement, peer learning, and follow-up support.
- Despite positive outcomes, the study reveals equity concerns in PD access, reaching only a small proportion of Bhutan's teaching workforce.
- Future research should examine how teacher learning translates into improved student inclusion, engagement, and academic success in inclusive classrooms.

Introduction

Inclusive education has emerged as a transformative approach to addressing classroom diversity, grounded in principles of equity and social justice. Rooted in the social model of disability, this paradigm shifts educational practices from exclusionary models to learning environments where every student, regardless of abilities or background, is valued and supported (UNESCO, 2020a). In Bhutan, inclusive education has become a cornerstone of national policy, reflecting the country's commitment to equity and educational justice. Key policy documents such as *The Bhutan Education Blueprint 2014–2024: Rethinking Education* and the *13th Five-Year Plan 2024–2029* emphasize the importance of equitable access to quality education (MoESD, 2014; RGoB, 2024). Furthermore, the *National Education Policy: Empowering the Future* reinforces the goal of ensuring "all have access to quality, inclusive education that supports diverse learning needs" (MoESD, 2025, p. 4), while the *National Policy for Persons with Disabilities* highlights equality and inclusivity (RGoB, 2019). Bhutan's ratification of the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) in 2023 further solidifies its commitment to inclusive education (Drukpa, 2023).

However, the successful implementation of these inclusive policies depends on teachers' capacity and preparedness, as they play a pivotal role in fostering classrooms that accommodate diverse learners (Dorji, 2015). Research highlights that effective inclusion requires both theoretical understanding and practical skills (Florian, 2014). Teachers must be adept at applying knowledge to practice. Studies indicate that the effectiveness of inclusive education is closely tied to teacher preparedness (Crispel & Kasperski, 2021; Dorji et al., 2021).

Globally, a persistent gap between policy and practice exists, and Bhutan is no exception. Many teachers report inadequate preparation for inclusive education, citing insufficient training (Dukpa et al., 2024; UNICEF, 2022). Research suggests that teacher competency is strongly correlated with the quality and duration of training (Donath et al., 2023). While the Ministry of Education and Skill Development (MoESD) has provided short-duration professional development (PD) workshops lasting three to five days during school vacations for teachers in inclusive schools, evaluations indicate that these programs are insufficient in equipping teachers with the necessary skills (UNICEF, 2022). Existing literature consistently identifies teacher competency as a central challenge in implementing inclusive education successfully (Chhetri et al., 2020; Chhetri, 2025; Dorji et al., 2021; Dorji & Schuelka, 2016; Dukpa et al., 2024).

As of December 2024, Bhutan has identified 44 inclusive schools and two specialized institutes for Deaf and Blind students, serving 1,326 learners with disabilities (MoESD, 2024). However, most teachers in inclusive settings are general educators with limited special education training, leading to challenges in effectively implementing inclusive education. Recognizing this gap, the MoESD has introduced an extended 16-day inclusive education training, incorporating modules on inclusive education and educational assessment. Given the significant investment in this program, evaluating its impact on teachers' knowledge and skills is essential.

Therefore, the current study aimed to assess the impact of the 16-day PD workshop conducted for 298 teachers from 44 inclusive schools across three training regions: eastern, western, and central Bhutan. The findings are intended to inform relevant stakeholders about the effectiveness of the program and guide the refinement of future professional development initiatives. Specifically, this study sought to explore the following research questions:

1. How do teachers perceive their knowledge in inclusive education and special education assessment before and after the training?
2. How do teachers perceive their competency level in inclusive education and special education assessment before and after the training?
3. Is there a statistically significant difference in the knowledge and skills of teachers before and after the training?

Current status of inclusive education in Bhutan

Inclusive education in Bhutan has evolved within a unique socio-cultural and philosophical framework shaped by the national development vision of Gross National Happiness (GNH), which emphasizes equity, compassion, and holistic well-being (MoESD, 2019). Unlike many countries where inclusive education is driven primarily by legal mandates, Bhutan's approach is deeply influenced by values rooted in harmony, interconnectedness, and community responsibility (Royal Education Council [REC], 2012; RGoB, 2024). In advancing inclusive education, Bhutan has adopted a whole-school approach that emphasizes inclusive pedagogy, a thriving and enabling learning environment, and equity in access and participation (MoESD, 2017). Policy frameworks such as the *National Policy for Persons with Disabilities (2019)*, the *Bhutan Education Blueprint 2014–2024: Rethinking Education* and *Standards for Inclusive Education* provide strategic direction for creating inclusive learning environments that accommodate a wide range of student needs (MoESD, 2014, 2017; RGoB, 2019) The endorsement of the UN Convention on the Rights of Persons with Disabilities (UNCRPD) by the Bhutanese Parliament in 2023 further reinforces the national commitment to transforming schools into inclusive spaces for all learners. Additionally, the 13th Five-Year Plan places strong emphasis on creating an inclusive society and providing equitable education (RGoB, 2024). Therefore, inclusion is not perceived merely as a policy mandate but as a moral and cultural responsibility grounded in the national philosophy of GNH (Wangdi & Boossabong, 2024). Consequently, schools are expected to foster not only academic growth but also social-emotional development, a sense of belonging, and respect for diversity.

Moreover, inclusive education in Bhutan has focused not only on integrating children with disabilities but also on addressing the broader diversity of learners, including those with learning difficulties, children from remote regions, and students facing social or economic disadvantages (MoESD, 2017). This broad conceptualization aligns with the global shift from a medical to a social model of disability, where barriers to learning are seen as arising from inflexible systems rather than from the learners themselves (Dorji, 2015; Schuelka, 2018). The Bhutanese education system thus recognizes that exclusion is not solely the result of individual impairments but is often embedded in structural, attitudinal, and institutional barriers that limit participation and achievement.

Cultural attitudes toward disability and inclusion also influence the implementation of inclusive education. Traditionally, disability in Bhutanese society has been associated with karma and regarded as a familial burden or spiritual consequence, contributing to stigma and social exclusion (Dorji, 2015; Kamenopoulou & Dukpa, 2018). Nevertheless, growing awareness driven by advocacy, education, and media has begun to shift public perceptions toward recognizing disability as a result of attitudinal and social barriers rather than individual fault. Despite this progress, traditional cultural beliefs still impact school environments and community engagement, sometimes hindering full inclusion (Dorji et al., 2021).

In addition to cultural perception, geographic and contextual challenges further complicate the implementation of inclusive education. Schools in rural and remote regions often face a shortage of trained special education teachers, inadequate teaching and learning materials, limited access to assistive devices, and poor infrastructure. School facilities such as classrooms, footpaths, and hostels remain physically inaccessible, and timely medical assessments are infrequent (Social and Cultural Affairs Committee [SCAC], 2024). Furthermore, the dire lack of specialized personnel, including educational psychologists, speech and language therapists, and occupational therapists, adds to the burden placed on general education teachers. Although 50 teachers have earned master's-level qualifications in inclusive education, many inclusive schools continue to operate without the support of trained special educators or medical professionals, leaving general teachers solely responsible for meeting the diverse needs of children with disabilities (SCAC, 2024). While research indicates that Bhutanese teachers generally hold positive attitudes toward inclusive education and children with disabilities, their willingness and commitment are often hindered by systemic barriers such as insufficient training, overcrowded classrooms, and a lack of essential resources (Dhendup & Gyelmo, 2024; Dorji et al., 2021).

Teacher competency continued to be one of the most critical challenges in the effective implementation of inclusive education in Bhutan. Numerous empirical studies, both past and recent, have consistently highlighted that many teachers working in inclusive schools are inadequately prepared (Chhetri et al., 2020; Chhetri, 2025; Dorji et al., 2021; Dorji & Schuelka, 2016; Schuelka, 2018; Subba et al., 2019; Womling et al., 2020). A substantial number of teachers report feeling underprepared to offer individualized support, differentiate instruction, or implement inclusive teaching strategies effectively, particularly in general education classrooms with mixed-ability learners (Dema et al., 2022; Dukpa et al., 2024; Jigyel et al., 2025). Given the complexity and multifaceted nature of inclusive education, effective implementation requires sustained investment in teacher preparation (UNESCO, 2020b).

Globally, UNESCO (2020b) has acknowledged that "there is often high demand among teachers for professional development on inclusion," (p. 3). Although teacher training institutions have begun incorporating inclusive education modules into their pre-service curricula (Chhetri et al., 2020), this measure alone is insufficient. While over 1,500 teachers have reportedly received five-day PD training on inclusive education (SCAC, 2024), there is a pressing need for continuous, context-specific in-service PD to enhance teachers' practical skills, pedagogical knowledge, and confidence (Childs et al., 2025; Dhendup & Gyelmo, 2024; UNICEF, 2021). Only through ongoing training and support can teachers be fully empowered to create inclusive learning environments that address the diverse needs of all learners.

The significance of teachers' competency and professional development in inclusive education

The global discourse on inclusive education positions teacher competency as the cornerstone of effective implementation (UNESCO, 2020b). Scholars widely agree that inclusion goes beyond just placing students in mainstream classrooms, it entails pedagogical expertise capable of addressing a broad spectrum of learning needs (Florian & Black-Hawkins, 2011). Teachers are crucial agents of change within educational settings (Guskey, 2002), and their professional readiness directly impacts the effectiveness of inclusive education practices where all students, irrespective of ability or background, can participate meaningfully and achieve success (UNESCO, 2020b).

Contemporary research characterizes teacher competency for inclusive education as a multifaceted concept, including knowledge, skills, values, and attitudinal dispositions (Kuyini et al., 2016; Nimante & Kokare, 2022). Empirical studies show that teachers with strong competency profiles have greater self-efficacy and are more effective in inclusive classroom environments (Donath et al., 2023; Johnson et al., 2024; Moscato & Pedone, 2024; Savolainen et al., 2022). A growing body of research consistently identifies teacher preparedness as a key factor in the success of inclusive education (Chhetri, 2025; Childs et al., 2025; Chumo, 2025; Dhendup & Gyelmo, 2024; Dukpa et al., 2024). Globally, reports suggest that teacher

preparation for inclusion remains inadequate (UNESCO, 2020b). In Bhutan, many teachers continue to report inadequate training and limited confidence in addressing the diverse needs of learners (Chhetri et al., 2020; Chhetri, 2025; Dorji et al., 2021; Dorji & Schuelka, 2016; Dukpa et al., 2024).

Teacher competence encompasses a broad range of professional qualities, including pedagogical knowledge, classroom management skills, assessment abilities, collaboration skills, and the ability to differentiate instruction (Majoko, 2019; Nimante & Kokare, 2022). At the international level, the European Agency for Special Needs and Inclusive Education (2015) outlines eight core areas of teacher competency. These include a comprehensive understanding of inclusive education, the ability to view learner diversity as a strength, and the promotion of academic, practical, social, and emotional development for all students. Similarly, the Global Framework of Professional Teaching Standards identifies three overarching domains: teaching knowledge and understanding, teaching practice, and teaching relationships (UNESCO, 2019). Bhutan's Competency-Based Framework for Special Education Teachers (MoESD, 2021) aligns closely with these global perspectives. It outlines thirteen essential competencies, including curricular and pedagogical knowledge; assessment and reporting skills; understanding of disabilities and inclusive education concepts; development and implementation of IEP; effective communication and collaboration; intervention strategies; use of assistive technologies and devices; knowledge of pathways programs; and the promotion of inclusive language and growth mindsets.

Florian and Black-Hawkins (2011) and UNESCO (2020b) contend that inclusive practice is not about delivering content to specific groups, but about cultivating a responsive pedagogy that accommodates every learner through universal and flexible teaching strategies. In line with this, Savolainen et al. (2022) and Darling-Hammond et al. (2017) posit that teachers' professional knowledge not only shapes their attitudes and self-belief, but also influences their willingness to adopt and sustain inclusive practices. Well-trained educators are more likely to identify students with additional needs early, adjust their teaching practices accordingly, and use data-informed instruction to support individual learning (Donath et al., 2023; Kuyini et al., 2016; Nimante & Kokare, 2022). Ultimately, when educators perceive themselves as capable and confident, they are more inclined to embrace and implement inclusive pedagogy.

Professional development serves as the primary mechanism through which such competencies are developed and maintained. High-quality, sustained PD enables teachers to bridge the gap between inclusive education policies and practice (Forlina & Chambers, 2011). Unlike traditional one-time workshops, effective PD is characterized by its extended duration, collaborative nature, and direct relevance to daily teaching challenges (Darling-Hammond et al., 2017; Desimone, 2009). Well-designed training programs have the potential to transform teachers' mindsets, strengthen their sense of efficacy, and lead to improved learning and social outcomes for all students (Dignath et al., 2022; Mavezera et al., 2024).

The necessity of PD becomes even more pronounced in contexts where resource and support systems are limited. In Bhutan, for instance, general education teachers often function without access to specialized personnel such as speech therapists, educational psychologists, or occupational therapists (Dema, personal communication, June 20, 2025). Many teachers also report limited exposure to inclusive education concepts during pre-service training (Chhetri et al., 2020). Consequently, there is an urgent need for in-service PD that is contextually relevant and responsive to the realities of classrooms. Mustafa and Pacarizi (2021), Sims et al. (2021), and Donath et al. (2023) argue that long-term, institutionally embedded professional learning is the most effective way to enhance teaching capacity and establish inclusive school cultures.

Furthermore, research elucidates that short-term, fragmented training models, such as isolated seminars or workshops, are ineffective for creating lasting pedagogical change. Instead, effective PD must be ongoing, tailored to the context, practice-focused, and collaborative (Wei et al., 2009). Such training provides practical tools, encourages reflective practice, and highlights models of effective instruction that educators can adapt to their specific situations (Darling-Hammond et al., 2017; Donath et al., 2023). Supporting this, McKinsey and Company assert that teaching quality is directly linked to student achievement and that the

strength of PD initiatives heavily influences this quality. Therefore, building teacher capacity should not be viewed as optional, it is a crucial prerequisite for achieving sustainable and meaningful inclusive education. Moreover, the evolving nature of inclusive education necessitates continuous learning. As educational research advances and student populations evolve, teachers require regular opportunities to update their knowledge, reflect on their practices, and innovate in response to emerging needs (Mavezera et al., 2024). Education systems that invest in comprehensive, lifelong professional learning help build cultures of inclusion where teachers feel empowered, students receive personalized support, and schools promote equity and excellence (UNESCO, 2020).

Ultimately, the relationship between teacher competency and PD represents a virtuous cycle: quality training enhances professional capabilities, which leads to improved classroom practice, better student outcomes, and greater motivation for continued learning (Darling-Hammond et al., 2017; Guskey, 2002). For education systems striving toward meaningful inclusion, prioritizing teacher development is not optional, it is foundational. The success of inclusive education depends not merely on physical infrastructure or well-crafted policies, but on the daily, deliberate interactions between empowered educators and their learners. These transformative interactions are made possible only through sustained PD (Darling-Hammond et al., 2017).

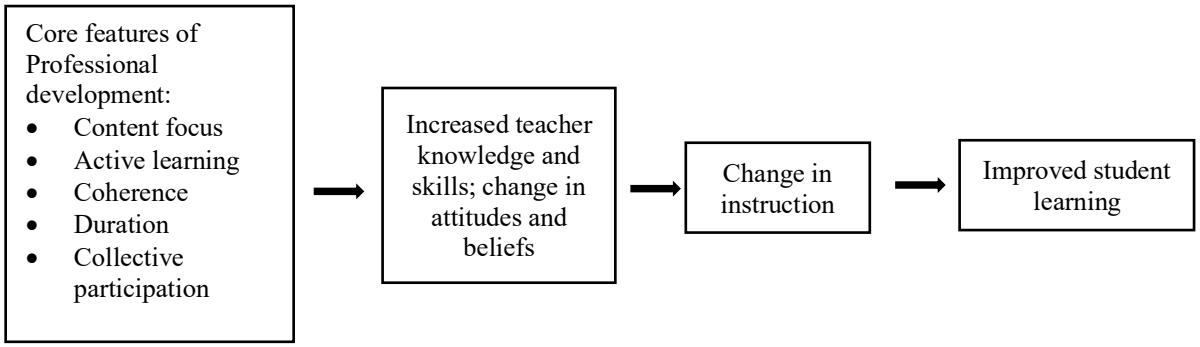
Theoretical Framework

This study is grounded in Desimone's (2009) conceptual framework for effective professional development, which provides a robust theoretical lens for examining the relationship between PD, teacher learning, and student outcomes. The framework is grounded in two interrelated theoretical foundations: the theory of teacher change and the theory of instruction. The theory of teacher change posits that when PD incorporates essential features, namely content focus, active learning, coherence, duration, and collective participation, it fosters significant gains in teacher knowledge, skills, and beliefs (Guskey, 2002). The theory of instruction extends this argument by emphasizing that changes in teacher capacity translate into modifications in instructional practice, which subsequently yield improvements in student learning outcomes (Desimone et al., 2002).

Within this framework, PD is conceptualized not as a one-time intervention but as a systematic and sustained process that equips teachers with the competencies needed to respond to diverse educational challenges (Desimone, 2009; Desimone et al., 2002) (Figure 1). Effective PD must therefore be content-rich, provide opportunities for active engagement and practice, maintain alignment with educational goals and policies, extend over a sufficient duration, and promote collaborative professional communities (Dignath et al., 2022).

For this study, Desimone's framework is particularly useful because it situates PD as the primary mechanism through which teacher development occurs and reinforces the link between teacher professional growth and student achievement. Furthermore, in adapting this framework, the present study emphasizes not only knowledge and skills but also teacher confidence and perceived competence as critical outcomes of PD. By incorporating these dimensions, the framework is extended to highlight how structured and sustained PD initiatives can have a strong impact on teacher efficacy, which is increasingly recognized as a vital determinant of effective teaching and learning in educational contexts.

Fig.1 *Conceptual Framework of Professional Development (Adapted from Desmone's (2009)*



Methodology

Research design

This study employed a quantitative research design using a pre- and post-training survey questionnaire. The study assessed the knowledge and skills of participants before and after the PD workshop using a questionnaire. The design enabled the researcher to measure the effectiveness of the training by comparing pre- and post-intervention data collected from the same cohort of participants.

Population and sampling

The study population comprised teachers who participated in the 16-day inclusive education PD workshop conducted across three regions of Bhutan: Eastern, Central, and Western. A total of 298 teachers attended the workshop. The study adopted a census sampling method, inviting all workshop participants to participate in the survey. According to Creswell (2012), a census sampling method involves including the entire population of interest in the study rather than selecting a subset. This approach is appropriate when the population size is manageable and the goal is to obtain comprehensive data from all individuals within that group. Of the 298 teachers, 235 participants voluntarily completed both the pre- and post-training surveys, forming the final sample for analysis.

Research instrument

The researcher developed the instrument based on the study's purpose and objectives. To ensure content validity and reliability, the questionnaire underwent an expert review process. Two experts in the field of inclusive education independently evaluated each item using the Item-Objective Congruence (IOC) index. The experts' ratings were averaged to calculate IOC indices for each item, with a scoring range from 0 (no congruence) to 1 (perfect congruence). An item criterion level was set at 0.5; items scoring below this threshold were revised or removed based on expert feedback.
In addition, inter-rater agreement was calculated to determine the level of consistency between the two experts. Of the 35 knowledge items reviewed, consensus was reached on 30, yielding an inter-rater agreement rate of 85.7%. For the 35 skills-related items, agreement was achieved on 29, yielding a rate of 82.9%. Both rates exceed the 80% benchmark recommended by Miles and Huberman (1994), thereby reinforcing the instrument's validity and reliability.

The final questionnaire consisted of three sections. The first collected demographic information such as gender, age, teaching experience, and qualifications. The second part comprised 30 items designed to assess teachers' self-reported knowledge on key inclusive education concepts. Items were rated on a 5-point Likert scale: 1 – No knowledge or understanding of this topic; 2 – Limited knowledge; have heard of it but unsure how it works; 3 – Moderate knowledge; understand basic concepts and ideas; 4 – Good knowledge; understand the topic and how to apply it; 5 – Excellent knowledge; fully understand and can explain or teach it. The third part included 29 items evaluating participants' self-perceived skills in applying inclusive education concepts and pedagogies. Responses used a 5-point scale: 1 – No skill or confidence at all; 2 – Limited skill; needs frequent guidance; 3 – Basic skill; can perform tasks with some support; 4 – Confident; can perform tasks independently; 5 – Highly skilled; can mentor or teach others. Higher mean scores reflected more positive perceptions of knowledge or skills, indicating a greater perceived impact of the training; lower scores suggested limited confidence or perceived ineffectiveness.

Data collection and analysis

Data for this study were collected through an online survey administered via Google Forms. The questionnaire was distributed twice, once at the beginning and again at the end of the 16-day PD workshop. This pre- and post-assessment design allowed for the measurement of changes in participants' knowledge and skills over the course of the training. Upon collection, the responses were coded and organized before being entered into IBM SPSS Statistics software for analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize participants' demographic information and overall responses to the knowledge and skills items.

To evaluate the effectiveness of the training, inferential statistics were employed. Specifically, paired-sample t-tests were conducted to assess whether there were statistically significant differences in participants' self-reported knowledge and skills before and after the workshop. This method was selected because it is appropriate for comparing the means of two related groups measured at two time points (pre- and post-intervention). A p-value below 0.05 was considered statistically significant, indicating that observed differences were unlikely due to chance. The combination of descriptive and inferential analyses provided both a broad and nuanced understanding of the workshop's impact on teacher competency.

Ethical consideration

Prior to data collection, ethical approval was obtained from the training program coordinator of the ECCD & SEN Division, MoESD. Participation was voluntary. Participants were informed about the study's purpose and objectives and given clear instructions regarding their rights as respondents. Informed consent was implied through the completion and submission of the survey.

Participants were also assured that their responses would remain confidential and anonymous, and that no personally identifiable information would be disclosed. The data collected were used exclusively for academic and research purposes. This study adhered to the ethical guidelines set forth by the Royal University of Bhutan (RUB), 2014 for conducting research involving human subjects (RUB, 2014).

Results

Demographic information

235 teachers completed both the pre- and post-training surveys. As shown in Table 1, participants were drawn from three training centers, with the highest representation from the central region (43.4%), followed by the western (40.9%) and eastern (15.7%). In terms of gender, the sample consisted of 126 male teachers (53.6%) and 109 female teachers (46.4%). Most participants were aged between 20 and 30 years (40.9%), followed by those aged 31–40 years (35.7%), 41–50 years (22.1%), and over 50 years (1.3%). Regarding teaching experience, 43.4% had less than five years, 17.0% had between six and ten years, and 39.6% had more than ten years. These demographics reflect a diverse group in terms of training location, gender, age, and teaching experience, which helps provide a comprehensive understanding of the workshop's impact.

Table 1. *Demographic Information (N=235)*

Variables	Category	Frequency	Percent (N=235)
Training center	Eastern	37	(15.7%)
	Western	96	(40.9%)
	Center	102	(43.4%)
Gender	Male	126	(53.6%)
	Female	109	(46.4%)
Age	20-30	96	(40.9%)
	31-40	84	(35.7%)
	41-50	52	(22.1%)
	Above 50	3	(1.3%)
Teaching experiences	Less than 5 years	102	(43.4%)
	6-10 years	40	(17.0%)
	More than 10 years	93	(39.6%)

Participants' perceived knowledge before and after the PD workshop

Table 2 presents a detailed comparison of participants' self-reported knowledge across 30 domains of inclusive education. Overall, the average knowledge score increased significantly from $M = 1.97$, $SD = 0.58$ at pre-training to $M = 4.12$, $SD = 0.48$ at post-training, indicating a substantial improvement in knowledge. At the domain level, participants reported notable increases across all 30 areas. For example, knowledge of inclusive education rose from $M = 2.63$, $SD = 0.73$ to $M = 4.27$, $SD = 0.56$; person-centered planning (PCP) improved from $M = 1.74$ to $M = 4.11$; Individualized Education Plans (IEPs) rose from $M = 2.06$ to $M = 4.18$. Additionally, understanding of assessment tools such as the Brigance reading assessment increased from $M = 1.52$ to $M = 4.19$. The most substantial gains were seen in previously unfamiliar areas such as Vanderbilt Assessment Tools from $M = 1.25$ to $M = 3.68$; Washington Group Questionnaire (WGQ) from $M = 1.27$ to $M = 3.74$, and Rapid Neurodevelopmental Assessment (RNDA) from $M = 1.51$ to $M = 3.85$.
The results suggest that the workshop had a strong impact on enhancing participants' understanding of inclusive education concepts and strategies. The consistently higher post-training means across all domains demonstrate that the training was effective in broadening teachers' knowledge base.

Table 2. *Participants' perceived knowledge level before and after the PD workshop*

	Knowledge domain	Pre-training		Post training	
		M	*SD*	*M*	*SD*
1	Inclusive education	2.63	.730	4.27	.563
2	Inclusion	2.69	.763	4.30	.544
3	Disabilities	2.75	.767	4.21	.542
4	Inclusive Language	2.39	.910	4.27	.607
5	Person-Centered Planning (PCP)	1.74	.834	4.11	.603
6	Individualized Education Plans (IEPs)	2.06	.930	4.18	.603
7	Accommodations Plans	2.10	.908	4.17	.613
8	Differentiated Instruction (DI)	2.41	.908	4.26	.609
9	Explicit Direct Instruction	1.75	.882	4.09	.673
10	Universal Design for Learning (UDL)	1.87	.887	4.15	.633
11	Understanding students with Autism Spectrum Disorder (ASD)	2.13	.814	4.07	.644
12	Understanding Students with Learning Disabilities (LD)	2.39	.827	4.12	.609
13	Understanding students with Attention Deficit Hyperactivity Disorder (ADHD)	2.10	.808	4.09	.654
14	Understanding Students with Intellectual Disabilities (ID)	2.14	.776	4.06	.596
15	Knowledge about students with Multiple Disabilities	2.08	.732	4.07	.623
16	Knowledge about students with Emotional and Behavioural Disorders	2.11	.779	4.02	.577
17	Understanding students with visual impairment	2.25	.862	4.19	.633
18	Understanding students with Speech and Language Impairments	2.18	.797	4.10	.623
19	Understanding Physical Disabilities	2.35	.799	4.18	.615
20	Standard for Inclusive Education	1.77	.787	4.05	.564
21	Guidelines for Assessment, Examination, Promotion and Transition for Students with Disabilities (AEPT)	1.69	.775	4.01	.573
22	PP Readiness Screening	1.84	.920	4.41	.609
23	Rapid Neurodevelopmental Assessment (RNDA)	1.51	.770	3.85	.813
24	Brigance: Reading Assessment Tools	1.52	.775	4.19	.640
25	Brigance: Writing Assessment Tools	1.54	.759	4.17	.644
26	Brigance: Listening Assessment Tools	1.52	.759	4.15	.626
27	Brigance: Oral Language Assessment Tools	1.50	.712	4.16	.617
28	Brigance: Numeracy Assessment Tools	1.49	.742	4.15	.675
29	Washington Group of Questionnaire (WGQ)	1.27	.572	3.74	1.027
30	Vanderbilt Assessment Tools	1.25	.553	3.68	1.065
	Over all	**1.97**	**.58**	**4.12**	**.48**

Participants' perceived skill level before and after the PD workshop

Table 3 presents a comparison of participants' self-rated skills across 29 inclusive education practices before and after the 16-day PD workshop. Overall, participants' skill scores showed a substantial improvement,

increasing from a pre-training mean of $M = 1.66$, $SD = 0.57$ to a post-training mean of $M = 3.89$, $SD = 0.52$. This indicates that the training was highly effective in enhancing participants' skills in implementing inclusive education strategies.

All skill domains showed consistent gains. Notable improvements included developing Individualized Education Plans (IEPs) from $M = 1.80$ to $M = 3.93$; 'using Brigance assessment tools (reading, writing, listening, numeracy) from $M = 1.44$ to $M = 4.00$; using PP readiness screening from $M = 1.68$ to $M = 4.14$; and using inclusive language from $M = 1.94$ to $M = 4.06$. Assessment tools that were previously unfamiliar showed the most significant gains, such as using the Washington Group Questionnaire (WGQ) from $M = 1.30$ to $M = 3.60$; using Vanderbilt Assessment Tools from $M = 1.30$ to $M = 3.56$ and 'conducting Rapid Neurodevelopmental Assessment' (RNDA) from $M = 1.45$ to $M = 3.61$.

The data suggest that teachers became more confident in applying inclusive practices and using educational assessment following the training. The strong increase across all domains demonstrates that the workshop effectively bridged prior skill gaps and equipped teachers with relevant competencies for inclusive classrooms.

Table 3. *Participants' perceived skill level before and after the PD workshop*

	Skills domain	Pre-training		Post training	
		M	***SD***	***M***	***SD***
1	Developing Individualized Education Plans (IEPs)	1.80	.826	3.93	.619
2	Developing Accommodation Plans	1.71	.759	3.95	.586
3	Using Differentiated Instruction (DI)	2.04	.800	4.01	.570
4	Using Explicit Direct Instruction	1.60	.746	3.96	.629
5	Applying Universal Design for Learning (UDL)	1.64	.761	3.96	.594
6	Teaching Students with Autism Spectrum Disorders (ASD)	1.70	.783	3.88	.625
7	Teaching students with Learning Disabilities (LD)	1.98	.800	3.95	.601
8	Managing students with Attention Deficit Hyperactivity Disorder (ADHD)	1.73	.741	3.87	.641
9	Teaching students with Intellectual Disabilities	1.83	.731	3.86	.591
10	Teaching students with Multiple Disabilities	1.74	.718	3.86	.591
11	Teaching students with Emotional and Behavioural Disorders	1.82	.752	3.83	.615
12	Providing accommodations for different types of disabilities	1.79	.742	3.87	.602
13	Creating accommodation plans	1.67	.734	3.94	.617
14	Teaching students with Speech and Language Impairments	1.69	.699	3.80	.652
15	Teaching Students with Hard of Hearing	1.68	.709	3.83	.716
16	Teaching Students with Visual Impairment	1.77	.704	3.91	.664
17	Teaching students with Physical Disabilities	1.85	.758	3.93	.640
18	Using Inclusive Language	1.94	.899	4.06	.621
19	Using Standards for Inclusive Education	1.69	.759	3.87	.630
20	Guidelines for Assessment, Examination, Promotion and Transition for Students with Disabilities (AEPT)	1.58	.719	3.83	.653
21	Using PP Readiness Screening	1.68	.831	4.14	.664
22	Carrying out Rapid Neurodevelopmental Assessment (RNDA)	1.45	.704	3.61	.896

23	Using Brigance Reading Assessment tools	1.45	.686	3.99	.660
24	Using Brigance Writing Assessment tools	1.44	.692	4.00	.663
25	Using Brigance Listening Assessment tools	1.43	.684	3.99	.650
26	Using Brigance Numeracy Assessment tools	1.45	.686	3.97	.636
27	Using Brigance Oral Language Assessment tools.	1.43	.671	3.96	.632
28	Using the Washington Group of Questionnaire (WGQ)	1.30	.559	3.60	.952
29	Using Vanderbilt Assessment Tools	1.30	.567	3.56	.991
	Over all	**1.66**	**.57**	**3.89**	**.52**

Statistical comparison of the impact of the PD workshop

A paired samples t-test was conducted to assess the impact of a 16-day PD workshop on teachers' perceived knowledge and skills. Results revealed a significant increase in knowledge from pre-training ($M = 1.97$, $SD = 0.58$) to post-training ($M = 4.12$, $SD = 0.48$), with a mean difference of 2.15, ($SD = 0.73$), $t(234) = 45.06$, $p < .001$, $d = 2.94$, 95% CI [2.05, 2.24]. Similarly, perceived skills significantly improved from pre-training ($M = 1.66$, $SD = 0.57$) to post-training ($M = 3.89$, $SD = 0.52$), with a mean difference of 2.23 ($SD = 0.76$), $t(234) = 44.71$, $p < .001$, $d = 2.92$, 95% CI [2.13, 2.33].

These results indicate that the 16-day workshop had a substantial and statistically significant positive impact on teachers' knowledge and skills in inclusive education concepts and educational assessment.

Table 4. *Paired samples t-test results of knowledge and skills before and after PD workshop*

	Pre-Training		***Post training***		***(Diff)***		***t***	***df***	***p***	***95% CI***	***d***
	M	**SD**	**M**	**SD**	**M**	**SD**					
Knowledge	1.97	.58	4.12	.48	2.15	.73	45.06	234	.000	[2.24, 2.05]	2.94
Skills	1.66	.57	3.89	.52	2.23	.76	44.71	234	.000	[2.33, 2.13]	2.92

Discussion

This study assessed the impact of a 16-day PD workshop on Bhutanese teachers' self-perceived knowledge and skills in inclusive education and educational assessment. The findings directly address the study's primary aim: to evaluate whether a 16-day extended PD workshop can enhance teachers' knowledge and skills in these areas. The statistically significant gains in both knowledge and skills, supported by large effect sizes, suggest that long-duration PD initiatives have the potential to improve teachers' knowledge and skills.

However, these outcomes also highlight systemic limitations and raise important questions regarding the sustainability of such impacts, equitable access to PD opportunities, and the extent to which new knowledge is transferred into practice.

Substantial gains in self-perceived competence (knowledge and skills)

The results showed significant improvements in teachers' self-perceived knowledge (Cohen's d = 2.94) and skills (Cohen's d = 2.92), demonstrating the workshop's effectiveness in enhancing teacher competence.

Participants reported greater understanding and acquisition of inclusive pedagogical strategies, disability categories, assessment tools, and curriculum adaptation techniques. These findings align with Dignath et al. (2022) who reported a large effect size (d = 0.63) from PD programs aimed at increasing teacher knowledge and skills. Similarly, Kuyini et al. (2016) and Majoko (2019) emphasize that effective professional learning should not only provide theoretical foundations but also equip teachers with practical tools applicable in real classroom settings. Likewise, the results support the work of Guskey (2002) and Paju et al. (2015), who argue that experiential, hands-on learning combined with reflection opportunities is crucial for transforming teachers' beliefs and practices.

Desimone's (2009) framework of professional development demonstrates that PD incorporating content focus, active learning, coherence with policy, and collective participation can foster meaningful changes in teacher knowledge, beliefs, and instructional practices. Findings from this study indicate that teachers valued the balance between conceptual understanding and practical strategies, aligning with Mustafa and Paçarizi (2021) and Dignath et al. (2022), who argue that PD is most effective when new knowledge translates into shifts in teacher beliefs and classroom practices.

Nevertheless, while these improvements are promising, the reliance on self-reported data requires cautious interpretation. While Desimone (2009) posits that gains in knowledge and skills are a necessary precursor to changes in practice, empirical verification is needed to determine whether these shifts are realized in classrooms. Future research should incorporate classroom observations, student performance data, and teacher interviews to examine how PD gains translate into practical teaching behaviors and impact learners in inclusive settings. As Avramidis and Norwich (2002) and Donath et al. (2023) caution that perceived competence may not necessarily translate into demonstrated classroom practice or long-term behavioral change. Therefore, the present findings should be interpreted as indicators of perceived readiness rather than conclusive evidence of applied proficiency.

PD Workshop Duration—Does It Matter?

The 16-day PD workshop represents a major advance compared to previous short-term initiatives such as the 3–5 day National-Based In-Service Programs (NBIPs), which UNICEF (2022) and Dorji and Schuelka (2016) noted were inadequate in building sustainable teacher competence. The extended duration allowed for deeper engagement, iterative practice, and reflective learning, all key elements emphasized by Darling-Hammond (2017) and Desimone (2009) as essential to effective PD. However, other international evidence suggests that "longer" is not always "better". Donath et al. (2023) and Sims et al. (2021) cautions that excessively prolonged PD, such as an uninterrupted 16-day workshop, may result in fatigue, stress, and reduced retention. When the volume of input is excessive, the retention capacity tends to decline (Mizuno et al., 2011). This accentuates the need for a balanced approach, designing PD that promotes lasting and meaningful change while also being mindful of teachers' workload, curriculum demands, and institutional constraints.

Therefore, rather than relying solely on duration, effective PD should be ongoing, collaborative, and systemically supported (Cordingley et al., 2015). Sustained PD that incorporates follow-up support, peer collaboration, and leadership engagement is more likely to promote meaningful and lasting change than one-off or overly intensive workshops (Donath et al., 2023; Sims et al., 2021; Whitworth & Chiu, 2015). Furthermore, the knowledge and skills gained through PD must be applied immediately in classroom contexts, with opportunities for teachers to practice and refine what they have learned. This practical application is essential to ensure lasting impact, regardless of the program's duration. This reaffirms the importance of evaluating not only teacher-related outcomes, but also how improvements in teacher competence translate into enhanced student engagement, inclusion, and learning. Therefore, this study recommends that future research examine the long-term impact of teacher PD on both instructional practices and student outcomes in inclusive school settings.

Equity and access to professional development training

An equally pressing concern is equitable access to quality PD. While the workshop reached 298 teachers across 44 inclusive schools, this represents a small proportion of teachers working in inclusive schools. In Bhutan, PD opportunities remain unevenly distributed, with teachers in remote or rural schools often facing challenges such as limited training options, inadequate funding, and reduced access to resources (Childs et al., 2025; Dhendup, 2021; Seden et al., 2024). Moreover, variations in school leadership support, infrastructure, and access to medical professionals further constrain teachers' ability to apply new strategies. These barriers create disparities in teacher preparedness, which in turn can affect student learning outcomes. According to McKinsey & Company (2007), the overall performance of an education system is limited by the quality of its teachers, especially in inclusive education, where teacher effectiveness directly influences student outcomes.

To address systemic inequalities in teacher development, PD must be institutionalized and made accessible to all teachers, rather than confined to select groups. Mentorship and coaching from experienced teachers or resource specialists can provide ongoing, practice-based support through demonstration, feedback, and modeling (Arnsby et al., 2023). Blended learning, integrating face-to-face sessions with online modules and professional communities of practice, offers flexibility and sustained engagement (Philipsen et al., 2019; Tabaldo, 2023). At the school level, Professional Learning Communities (PLCs) can further embed PD into daily practices by fostering collaborative lesson design, reflective dialogue, and shared inquiry (Ikpuri & Peter, 2024). For these models to be effective, however, strong policy frameworks, committed leadership, and adequate funding and resourcing are essential (Rajendran et al., 2023; Whitworth & Chiu, 2015). As Sims et al. (2021) emphasize, inclusion cannot be achieved through fragmented initiatives; rather, it requires a national commitment to continuous, career-long professional learning. Moreover, PD must be differentiated and responsive to the prior experience and diverse needs of teachers, ensuring greater relevance and impact (Gökmenoğlu & Clark, 2015; Nimante & Kokare, 2022).

Limitations and future directions

While the study provides evidence of the impact of the 16-day workshops, several limitations should be acknowledged. First, the study relied on self-reported measures of knowledge and skills, which may be subject to social desirability bias or overestimation of competence. Second, the absence of longitudinal follow-up limits the ability to determine whether the reported gains are sustained over time and whether they translate into lasting improvements in inclusive education practices. Third, although a census approach was used to invite all workshop participants, only 235 out of 298 teachers completed both pre- and post-surveys, which could introduce nonresponse bias if those who did not complete the surveys differed systematically from those who did. Fourth, the study did not include direct measures of student outcomes, making it difficult to assess the ultimate impact of teacher PD on learner engagement, inclusion, and achievement. Finally, contextual factors such as school resources, leadership support, and regional differences were not controlled for, which may have influenced the effectiveness of the workshop.

Addressing these limitations in future research, for example, through employing mixed-methods designs, classroom observations, teacher interviews, longitudinal tracking, and assessment of student improvement, would provide a more comprehensive understanding of the effectiveness and practical impact of a 16-day PD workshop in inclusive education. As Dixon et al. (2014) and Seden et al. (2024) emphasize, the ultimate goal of PD is not solely to enhance teacher knowledge and skills, but to positively impact student experiences, foster success in inclusive settings, and support the development of 21st-century skills.

Conclusion

Investing in teacher development is not only a pedagogical necessity but also a moral and philosophical imperative, particularly in Bhutan's context of Gross National Happiness. The results of this study reaffirm that well-designed, sustained PD programs can significantly enhance teachers' perceived readiness to implement inclusive practices. However, realizing the full potential of inclusive education will depend on addressing structural constraints, ensuring equitable access to PD, and embedding inclusive practices across all levels of the education system. The success of inclusion, ultimately, lies not in policy documents or infrastructure, but in the day-to-day interactions between well-prepared teachers and the diverse learners they serve.

Acknowledgement

The researcher would like to express sincere gratitude to the ECCD & SEN Division, MoESD, for granting approval to conduct this study. Special thanks are extended to the regional trainers and workshop coordinators for their support during the data collection process. The researcher is also deeply grateful to all the participating teachers for their time, cooperation, and honest responses, which made this study possible.

Conflict of interest

The author declares no conflict of interest related to this study. The research was conducted independently and without any financial or institutional influence that could affect the outcomes or interpretations.

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