The Impact of Gender and Inclusive Pedagogies on Student Participation and Learning Achievement at Secondary School During the Pandemic and Beyond

- a cross-cultural experimental study being implemented in Bangladesh, Nepal, Bhutan, Timor-Leste and Vietnam since May 01, 2021 to November 2023

Bhutan/Bangladesh/Nepal/ Timor-Leste/Vietnam

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iii. Abbreviations

B.Ed	Bachelor of Education
DEO	District Education Officer
ECCD	Early Childhood Care and Development
ESCAP	Economic and Social Commission for Asia and Pacific
GIP	Gender and Inclusive Pedagogies
GPE-KIX	Global Partnership for Education-Knowledge and Information Exchange
IDRC	International Development Research Center
LMS	Learning Management System
M.Ed	Master of Education
MoESD	Ministry of Education and Skills Development
NEAF	National Education Assessment Framework
NSCF	National School Curriculum Framework
PGDC	Post Graduate Certificate in Education
PGDCCP	Post Graduate Diploma in Contemplative Counselling and Psychology
PGDE	Post Graduate Diploma in Education
PTC	Primary Teaching Certificate
RGoB	Royal Government of Bhutan
SACIE	School Attitude towards Inclusion Evaluation
SCE	Samtse College of Education
SEN	Special Education Needs
TEIP	Teacher Efficacy for Inclusive Practices
TPB	Theory of Planned Behavior
TPD	Teacher Professional Development
WASH	Water, Sanitation and Hygiene

1. Introduction

Throughout history, education has always been seen as a significant human right that serves as a social equalizer. This idea of education is supported by the United Nations agenda setting such as the Jomtien "Education for All" Conference (UN Inter-Agency Commission, 1990), the Dakar World Education Forum (UNESC0, 2000), and the Millennium Development Goals (UN, 2000). In recent times, inclusive education (IE) has changed educational reforms and practices around the world. As such, Bhutan adopted the Education for All - Dakar Framework for Action in 1994, ratified the Rights of the Child (CRC) in 1990, signed the Convention on the Rights of the Persons with Disabilities (UNCRPD) in 2010, and became a signatory to the Proclamation of the Economic and Social Commission for Asia and Pacific (ESCAP) Commission on Disability on the Full Participation and Equality of People with Disabilities in 2008 (MoE, 2012). Inclusive education resonates in many national and educational policies of the country. The Constitution of the Kingdom (Article 7, Section 15, 2008) states that every child has the right to education regardless of one's physical challenges, socio-economic status, religion, mental illness, sex, language, race, and caste. In Bhutan, there has been considerable progress in terms of improving access and quality of education since the 1960s. Education has always been accorded a high priority in Bhutan's development efforts and quality of education is recognised as one of the key educational aspirations in the national policy of Gross National Happiness.

Particular evidence of this commitment is the tireless efforts of the Ministry of Education and Skills Development (MoESD) to promote diversity in schools and ensure equal educational opportunities, especially for children with disabilities. Central to this commitment are the Inclusive Education Standards developed in 2017 by the Division of Early Childhood Care and Development and Special Educational Needs (ECCD & SEN) in MoESD. By 2022, over 1100 children with disabilities across 28 inclusive schools and specialized institutes have been integrated. Furthermore, Bhutan's educational ethos, as outlined in the 2020 National School Curriculum Framework (NSCF), places inclusivity at its core and advocates for an education system that celebrates and integrates the diverse perspectives, backgrounds, and latent potentials of every learner. This resolute commitment to equity is further underscored in the 2020 National Education Assessment Framework (NEAF).

However, the historical paradigms in Bhutan, reminiscent of many societies, once strictly adhered to traditional gender roles and relegated women primarily to household responsibilities while

giving men increased social importance, particularly in rural contexts. These historical circumstances limited women's access to education and economic opportunities and perpetuated deep-rooted gender differences. Challenges remain in ensuring the inclusion of children with disabilities in education due to limited facilities and the need to improve educators' capacity for inclusive teaching practices. Globally, educational disparities often manifest in limited student participation and suboptimal academic performance, particularly at the secondary education level. In Bhutan, although it is close to achieving universal primary education with an adjusted net enrolment rate of 96.5 percent as of 2019, the transition rate from lower secondary (class VIII) to middle secondary level (Class IX) is observed at 90% and from middle secondary to higher secondary level (Class XI) at 72.2% which shows the gap is greater at the secondary level (Ministry of Education, 2020). This indicates a need to prepare for a more inclusive approach to education. Moreover, the draft National Education Policy (MoE, 2022) requires all tertiary education institutions to plan academic programmes, teaching pedagogy, physical infrastructure, scholarship, and disaster management based on diversity such as gender, disabilities, and economic background of the students.

The emergence of the COVID-19 pandemic exacerbated these inequalities, disproportionately impacting low-income countries such as Bhutan. Gender inequalities are associated with a range of social disadvantages, including entrenched gender norms and socioeconomic inequalities, and have a profound impact on student participation and academic performance, particularly at the secondary school level. For example, girls from marginalized communities are at a higher risk of dropping out of school compared to their male counterparts, while students with special educational needs face greater academic barriers. These challenges arise from a variety of factors such as traditional gender roles, limited access to quality education, and discriminatory practices. Furthermore, Bhutan, like many other countries, was unprepared to face a pandemic emergency. Of particular note is the persistence of traditional teaching and learning methods in Bhutan, which represent significant hurdles in the transition to competency and skills-based educational models. The persistence of these challenges increases the risk of a decline in student engagement and achievement, particularly concerning gender equality and inclusion.

Without urgent action, the prospects for student participation and achievement, particularly concerning gender equity and inclusion, could further deteriorate. Addressing these challenges requires the use of Gender and Inclusive Pedagogy (GIP), which provides a proven range of

interventions to ensure equitable participation and learning achievement while addressing differences in students' gender, ability, ethnicity, and backgrounds.

Therefore, recognizing the need to participate in education reform exercises and also to realize His Majesty's vision for quality education, Samtse College of Education (SCE), Bhutan's only institute for secondary school teacher education, collaborated with Vietnam National Institute of Educational Sciences (VNIES), Open and Distance Education Centre (ODEC), Tribhuvan University, Nepal, and Timor Lorosa'e National University (UNTL), Timor-Leste, and Institute of Education and Research (IER), University of Dhaka, Bangladesh, as the lead consultant, carried out this study to support the GIP project of the selected secondary teachers. The research project was funded by the International Development Research Centre (IDRC), Canada, through the Global Partnership for Education Knowledge and Innovation Exchange (GPE-KIX). The study intended to introduce an evidence-based professional development package for teachers focused on gender and inclusion. Strengthening teachers' competencies to address equity issues aimed to improve student participation and learning achievement. The focus of this research was an experimental design to evaluate the impact of GIP interventions. Expected outcomes include positive changes in teachers' attitudes, self-efficacy, teaching methodologies, and resulting positive impacts on student engagement and learning outcomes. Additionally, the project sought to expand its impact beyond individual classrooms, driving lasting change at a national level.

The study's findings will empower relevant stakeholders to initiate discussions and develop policies and plans aimed at promoting inclusion in education.

2. Aims and Objectives

This study aimed to measure the impact of GIP approaches on Grade VII and IX students' participation and learning achievement at the secondary school level during the COVID-19 pandemic and beyond. The specific objectives of the study were to:

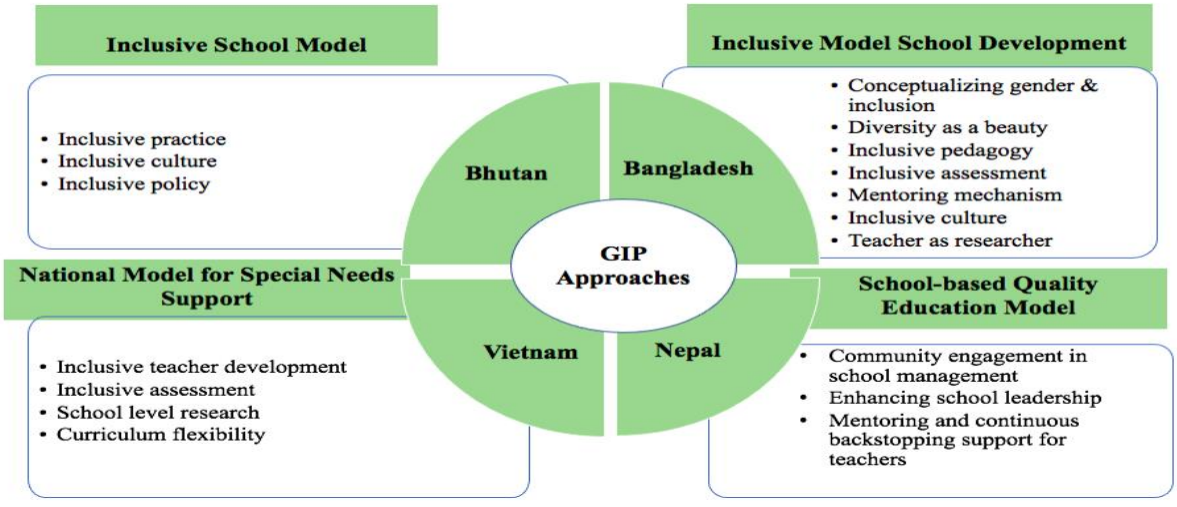
I. identify any changes that may occur in teachers' attitudes, efficacy, and practice towards gender and inclusive pedagogy;
II. identify the extent to which students' participation and learning achievement are impacted by GIP approaches during the COVID-19 pandemic and beyond;
III. identify the impact of GIP approaches on students' participation and learning achievement based on gender and other backgrounds during the pandemic and beyond; and

IV. identify sustainability mechanisms for GIP approaches at country and regional levels.

3. Gender and Inclusive Pedagogy

With the aim of ensuring equitable student participation and learning achievement, the GIP approach was developed as a teacher professional development intervention that is proven to exist in Bangladesh (Asian Center for Inclusive Education and ActionAid Bangladesh 2016; Plan International Bangladesh, 2013-2019), Bhutan (Ministry of Education, 2017), Nepal (Ministry of Education Nepal, 2019) and Vietnam (Vietnam National Institute of Educational Sciences, 2019) as shown in Figure 1. The prominent design of the GIP approach was adopted from Bangladesh's PIB project, which has provided home ground evidence for the development of inclusive model schools in mainstream government primary schools in Bangladesh. In order to further strengthen the model, taking into account the contextual issues of inclusive education, some components of other models were also included in the co-design of the GIP approach. For example, the GIP approach also utilized the professional development insights of ACIE teachers and local education administrators in the context of Bangladesh, the insights of the Inclusive School Model of Bhutan, the school Based Quality Education Model of Nepal and the National Model for Inclusive Education Support of Vietnam (Figure 1 below.)

Figure 1: *Co-designed Gender and Inclusive Pedagogical (GIP) Approaches*



As described above, the GIP approach consisted of various gender and inclusion related project components from Bhutan and the other consortium countries that had proven successful in their respective country contexts.

The GIP approach model includes the Bhutanese component, the *National Model for Inclusive Education* which represents a typical inclusive school (mainstream school with a SEN program) with its three main areas of focus: inclusive culture; inclusive policy; and inclusive practice. All three dimensions work together to create inclusive schools. The model has shown positive impacts on the enrolment of students from marginalized backgrounds. For example, in 2019, a total of 797 (492 Males and 305 Females) with Special Education Needs (SEN) were admitted to 19 schools across the country. Despite these initiatives, the Bhutanese education system still faced several challenges in implementing a quality gender and inclusive pedagogical framework due to lack of teacher preparedness, lack of public and community awareness, limited student access due to infrastructural context, and lack of resources.

Based on the above mentioned contextually developed insights, the GIP approach specifically addressed the component of professional development for teachers. The intervention activities were carried out in three components collectively. The School Culture component included development of inclusive school culture (e.g., parents, school management committee and local education authority engagement), the Classroom component included development of teachers' attitude, efficacy and practice for an inclusive classroom (e.g., understanding of the concept of gender, inclusion and diversity, using multi-sensory teaching-learning materials, ensuring classroom management and learning through inclusive pedagogy in classroom, inclusive assessment, student participation, and developing teachers as researchers), and the Collaboration and Networking component included a multi-dimensional platform for regional and international collaboration, sharing, and networking (LMS , EMIS, cell phone network and social media platform; policy advocacy mechanism; multi-dimensional Experts groups; multi-institutional collaboration, and regional hub).

The above mentioned co-designed components have been proven to have a positive impact on teachers' attitude, efficacy, inclusive classroom practices, and have received global and national recognition. Given the COVID-19 situation, GIP used a blended model of teacher's pedagogical intervention, both face-to-face and remote strategies [a blended Learning Management System (LMS) for the teachers and the students during pandemic and beyond. An experimental research

design was used in which teachers of experimental schools received GIP intervention through the teacher professional development package. Changes in teachers' attitudes, efficacy and practice were measured as the outputs and students' participation and achievement were measured as final outcomes of the intervention, comparing the outputs and outcomes with control schools that did not receive the intervention.

Gender and inclusive pedagogical approaches blended two core concepts: a gender transformative strategy and inclusive pedagogy. The Gender transformative strategy ensured gender equity and equality, empowerment, choice of decision-making, shared control of resources, and redefining gender roles (International Development Research Centre [IDRC], 2020). Inclusive pedagogy ensured system change to improve participation (access, attendance, engagement in academic and cocurricular activities, promoting school culture) and learning achievement (achieving competencies) of all students regardless of their abilities, ethnicity, geographical remoteness, diversity, and other backgrounds (Global Campaign for Education, 2020). When these two strategies are combined, inclusive reforms take place leading to gender equity.

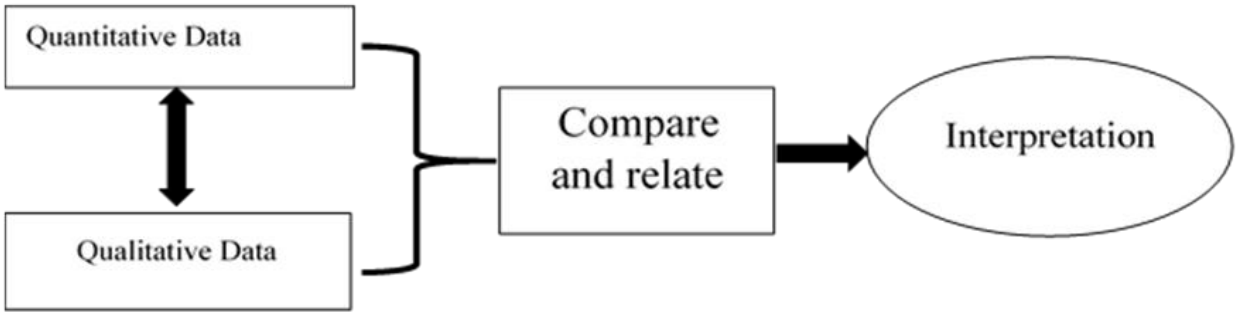
4. Research Approach and Design

As the aim of this study was to evaluate the impact of GIP interventions on teachers' attitudes, intention, concern, efficacy, practices, gender sensitivity, student's psychological sense of belongingness and student participation and achievement, a mixed methods approach was employed for this research since it offers better ways of addressing the research problem than qualitative and quantitative in isolation. Furthermore, Creswell and Creswell (2018) stated that the mixed methods approach in research resides in the middle of the continuum because it incorporates elements of both qualitative and quantitative approaches.

The study employed a quasi-experimental research design for a quantitative phase in which the study explored the effectiveness GIP interventions on teachers' attitudes, intention, concern, efficacy, practices, gender sensitivity, student's psychological sense of belongingness and student participation and achievement.

Figure 2.

Convergent Parallel research Design



Source: Convergent Parallel Research design (Creswell, 2013).

Regarding the survey questionnaires for participants who were the teachers and students, the survey questionnaires were contextualized based on educational terminologies used in the Bhutanese education system.

4.1. Data Analysis

Quantitative data were subjected to rigorous statistical analyses that included descriptive statistics (e.g., means, standard deviations) to summarize numerical data, while inferential statistics (e.g., t-tests, ANOVA) facilitated comparisons between pre-and post-intervention measurements. Qualitative data obtained from interviews, observations, and other qualitative methods were subjected to thematic analysis. This qualitative approach involved coding and identifying recurring themes and patterns within the qualitative dataset, allowing for a nuanced understanding of the impact of interventions in promoting inclusive education practices. Bringing together these different research tools and analysis strategies ensured a robust and comprehensive assessment of the impact of the interventions on promoting inclusive practices in educational settings.

4.2. Sample Size

The participant pool consisted primarily of teachers teaching grades VII and IX across 10 experimental schools and 10 control schools in 20 dzongkhags (districts). During the baseline phase, 158 teachers from the experimental schools and 169 teachers from the control schools were involved in data collection. In contrast, the endline phase targeted 90 teachers from the control schools and 64 teachers from the experimental schools, indicating a shift in participation rates over

the course of the intervention. Table given below summarizes the number of participants who responded to each research instrument:

Table 1

Number of participants who responded to each research instrument

Tools	School Observation	Classroom observation scale	Survey questionnaire	Semi-structured Interview	FGD	Pre-post competency-based achievement test
Baseline (Experimental)	10	10	0	0	65	0
Baseline (Control)	10	10	0	0	0	0
Midline (Experimental)	0	0	64	0	64 51	0
Endline (Experimental)	10	10	64	28	46	
Endline (Control)	0	0	90	0	0	0
Total	30	30	118	28	126	

4.3. Data Collection Tools and Techniques

The study used a comprehensive array of validated tools and methods to thoroughly assess the impacts of interventions on inclusive education practices. The tools used included the (School Attitude towards Inclusion Evaluation) SACIE questionnaire, designed to measure the attitudes of school staff and stakeholders towards inclusive education. The Teacher Efficacy for Inclusive Practices (TEIP) survey measured teachers' perceived efficacy in implementing inclusive teaching strategies. Additionally, a survey-based Intended Practice Scale captured teachers' expected approaches to inclusive practices. The Classroom Observation Scale, used during in-person classroom assessments, allows for structured assessment of behaviours indicative of inclusive education.

In addition, the research included qualitative methods such as semi-structured interviews with teachers, students, and Principals. These interviews provided qualitative insights into experiences and perceptions regarding the impact of the interventions. The study also used various methods including competency-based pre- and post-achievement tests, photo voice, survey questionnaires, focus group discussions (FGDs), document reviews, and observations during training sessions. These different approaches addressed different stakeholders and contexts and provided data for analysis.

The data collection process was systematically divided into three distinct phases: Baseline, Midline, and Endline, each carefully designed to measure the impact of the GIP intervention. These phases aimed to assess specific dimensions, in particular, teachers' attitudes, intention, concern, self-efficacy, classroom practices, gender sensibility and students' sense of psychological belongingness while checking students' participation and learning achievements.

These instruments were used in the experimental and control groups to collect quantitative and qualitative data on various aspects of the intervention's impact. The specific focus on teachers' attitudes, efficacy, and classroom practices, as well as students' participation and academic achievement, enabled a comprehensive assessment of the impact of the intervention over the course of the study.

4.4. Demographic Profile of Participating Schools

The GIP project focused on supporting secondary-level teachers in Bhutan encompassing 10 experimental schools and 10 control schools from higher secondary and middle secondary schools. These partner schools were selected to represent urban, semi-urban and rural areas. In Bhutan, secondary education comprises lower secondary (grade VII-VIII), middle secondary (grade VII-X), and higher secondary (grades VII-XII).

The secondary school system in Bhutan places a great emphasis on promoting a child's overall development, including their intellectual, physical, and social well-being. The aim is to provide a comprehensive inclusive education that goes beyond mere academic achievement and encourages students to develop critical thinking, creativity, innovation, collaborative and problem-solving skills. Additionally, it highlights the significance of engaging in co-curricular activities and community involvement.

These schools adhere to a nationally developed curriculum framework, which is divided into different stages and includes different specialized areas of study corresponding to each secondary level. These schools adhere to a nationally developed curriculum framework, which is divided into different levels and includes different specialized areas of study corresponding to each secondary level. Assessments for secondary school students include continuous and summative assessments, including national examinations held in classes VIII, X and XII. In order to move on to the next higher grade level, it is necessary to achieve the required minimum number of points and meet specified exclusion criteria in these exams.

4.5. Description of Partner Schools

The GIP project successfully collaborated with 10 experimental schools and 10 control schools across the country to implement the GIP practices. All of these schools were government institutions that played critical roles in piloting the GIP activities. Some schools are central schools with some administrative and management autonomy. Out of ten control schools three schools are already inclusive schools.

Table 2

Location and type of Experimental School

School Codes	Location	Grade Levels	Type of School	Region
1B	Urban	IX-XII	Government coeducational higher secondary school	Central-western
2CZ	Urban	Pre-primary – X	Government Coeducational middle secondary school	Western
3C	Rural	Pre-primary – XII	Government Coeducational central school	Central-eastern
4K	Rural	IX-XII	Government Coeducational higher secondary school	Eastern
5N	Rural	VII-XII	Government Coeducational central school	Southern
6S	Rural	Pre-primary – XII	Government Coeducational higher secondary school	Central Eastern
7T	Rural	VII-XII	Government Coeducational central school	Central-western
8TG	Semi-Urban	Pre-primary-X	Government coeducational middle secondary school	Eastern

9W	Rural	Pre-primary – XII	Government coeducational central school	Western
10Y	Rural	Pre-primary-XII	Government coeducational central school	Eastern

Table 3

Location and type of Control School

School Codes	Location	Grade Levels	Type of School	Region
1CA	Rural	VII-XII	Government coeducational higher secondary school	Western
2GD	Semi-Urban	Pre-primary-XII	Government Coeducational Higher secondary school	Western
3B	Rural	Pre-primary-XII	Government Coeducational central school	Central-Western
4T	Rural	Pre-primary-XII	Government Coeducational central school	Central-Western
5D	Rural	VII-XII	Government Coeducational central school	Central-Western
6S	Rural	VII-XII	Government Coeducational central school	Central Eastern
7G	Urban	VII-X	Government Coeducational middle secondary school	Central Eastern
8P	Rural	Pre-primary-10	Government coeducational middle secondary school	Eastern
9TL	Rural	VII-XII	Government coeducational central school	Central Eastern
10SJ	Rural	Pre-primary-XII	Government coeducational higher school	Eastern

5. **Demographic Profiles of Participants**

Since this project was well-situated to address equity and inclusion, the gender composition of the study participants was also considered when selecting participants. Table 4 shows the gender diversity of participants. In general, the age of the participants ranged from 25 to 50 years with the maximum (n=.45) in the age group of 30-50.

Table 4

Distribution of participants in each Gender

	Experimental	**Control**
Male	35	53
Female	29	37
Total	64	90

Table 5.
Participants age of each group

	Experimental	Control
<30	15	38
30-50	45	50
>50	4	2
Total	64	90

5.1. Professional Qualifications of Participants

As shown in Table 6, the qualifications of the teacher participants included BEd. (Bachelor of Education), PTC (Primary Teacher Certificate), ZTC (Zhungkha Teacher Certificate, PGCE (Post Graduate Certificate in Education), PGDE (Post Graduate Diploma in Education), PGDCCP (Post Graduate Diploma in Contemplative Counselling and Psychology) and M.Ed. (Master of Education).

Table 6

Professional Qualifications of Teacher Participants (Experimental and Control Schools)

	BEd	**PTC/ZTC**	**MED**	**PGDE/PGCE/PGDCCP**	Total
Experimental School	44	2	16	2	64
Control School	68	1	12	9	90

5.2. Teacher Participants Who Taught Classes VII and IX

The GIP project's aim was to enhance participation and learning achievement of grades VII and IX students in the experimental schools by elevating teachers' pedagogical practice. Illustrated in figure 3 the GIP projects involved teachers who taught students in classes VII and IX across various subjects.

Figure 3

Teacher Participants Who taught grade VII

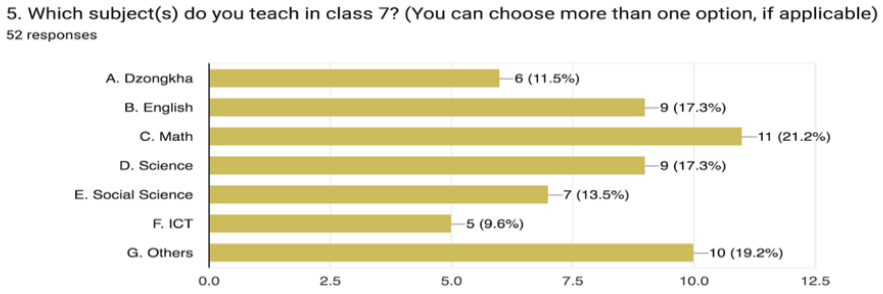
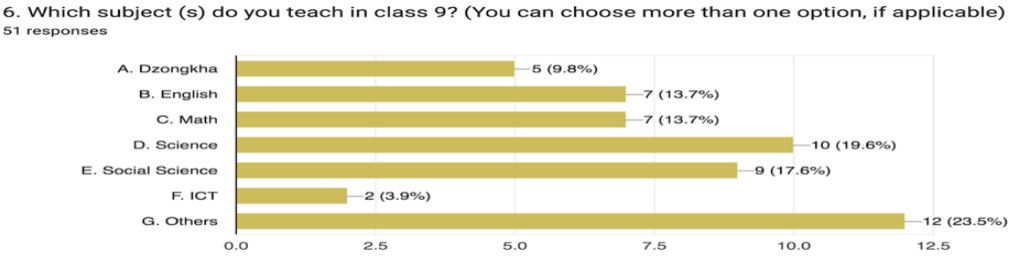


Figure 4

Teacher Participants Who taught grade IX



6. Professional Development Package

The Teacher Professional Development (TPD) package, designed for secondary school teachers and principals in secondary, is based on the GIP approach. The main aim was to bring about positive changes in the attitudes, efficacy, and pedagogical practices of educators, ultimately to improve the participation and learning achievements of students in grade VII and IX in experimental schools. The content covered in TPD consisted of four progressive tiers, each addressing different aspects of GIP (see table 7).

Table 7

Content coverage of GIP trainings

Training	Number of Participants	Topics Covered	Number of Training Days
Tier 1	65	● Understanding of GIP ● Student diversity ● Classroom management in a diversified classroom ● Inclusive school culture (co-curricular activities, leadership, mentoring, PLC) ● Technology integration. ● Pre-test and Post-test	4 Days
Tier 2	64	understanding and skills on pedagogy (blended pedagogy having opportunity of face to face and distance mode learning) ● Multi-sensory teaching learning materials ● Classroom communication ● Cooperative learning and assessment (continuous and summative) ● Differentiated Instruction ● Universal Design for Learning ● Simulation classes ● Challenge analysis, troubleshooting, and follow up and feedback on previous session learning. ● Pre-test and Post-test	4 Days
Tier 3	51	● Inclusive assessment practice (summative and continuous) ● Challenge analysis ● Troubleshooting ● Follow-up and feedback on previous session learning ● Pre-test and Post-test	4 Days
Tier 4	46	● Action Research ● Using Action Research to solve classroom challenges ● Follow-up and feedback on previous session learning	4 Days

7. Results

The GIP study has concentrated on six sub-thematic areas, primarily encompassing School and classroom observations. Data were gathered from a total of twenty schools within the Kingdom of Bhutan, comprising ten experimental and ten control schools. Baseline data collection was carried

out prior to the implementation of the GIP interventions, while endline data were collected after the interventions, with the aim of delineating the effects of the four-tiered GIP interventions. To validate the stated impact of the GIP interventions, both qualitative and quantitative data were employed to triangulate the findings.

7.1. School Observation Results

7.1.1. School Infrastructure

The infrastructure of schools is pivotal in fostering gender equality and inclusivity within educational settings. In an effort to enhance these aspects, GIP interventions were administered to the District Education Officers (DEOs), Principals, and Teachers of the ten experimental schools involved in the study. Data collection was conducted in two phases: baseline and endline.

At the baseline phase, the control schools demonstrated a lower composite mean of 1.89 in comparison to the experimental schools, which exhibited a composite mean of 2.18. This suggests that the experimental schools had better infrastructure conditions at the start of the study. In the endline, although both groups of schools showed improvements, the experimental schools showed a larger increase in their composite mean (from 2.18 to 2.43) compared to the control schools (from 1.89 to 1.93) as shown in table 8. This suggests that the intervention in experimental schools led to a more significant improvement in school infrastructure compared to the control group.

Table 8

Baseline and endline composite mean of School Infrastructure for control and experimental schools in Bhutan

Variables	**Groups**	**Baseline**		**End line**		
		N (schools)	**Composite Mean**	**N (Schools)**	**Composite Mean**	**Sig.** (Difference) In baseline and end line
School Infrastructure	Control	10	1.89	10	1.93	0.833
	Experimental	10	2.18	10	2.43	0.403

Despite the greater improvement observed in the experimental schools, the difference in endline means between control and experimental schools was not statistically significant (p-value = 0.403). This shows that although both groups of schools showed some improvements over time, the improvements were similar between the group that received the intervention and the group that

did not. Although the intervention may have helped a little, it did not result in a noticeable benefit or better outcome compared to the schools that did not receive the intervention.

7.1.2. Wash infrastructures

Similar to school infrastructure, the experimental schools started with a higher baseline composite mean for Water, Sanitation and Hygiene (WASH) infrastructure (2.40) compared to the control schools (1.98), indicating better starting conditions in the experimental schools. However, both control and experimental schools showed improvements in WASH infrastructure from baseline to endline. Notably, the experimental schools showed a larger increase in their composite mean (from 2.40 to 2.60) compared to the control schools (from 1.98 to 2.04).

Despite the greater improvement in WASH infrastructure in experimental schools, similar to school infrastructure, the difference in endline means between control and experimental schools was not statistically significant (p-value = 0.209). This means that although the intervention led to improvements in WASH infrastructure, it did not provide a statistically significant advantage over the control group.

Table 9

Baseline and endline composite mean of WASH Infrastructure for control and experimental schools in Bhutan

Variables	Groups	Baseline		End line		
		N (schools)	**Composite Mean**	**N (Schools)**	**Composite Mean**	**Sig.** (Difference) In baseline and end line
Wash infrastructure	Control	10	1.98	10	2.04	0.871
	Experimental	10	2.40	10	2.60	0.209

Focus group discussions with students in experimental schools highlighted hygiene and sanitation concerns as recurring themes. Specific examples included problems such as garbage, unclean toilets, missing doors, and unpleasant smells. Students identified these challenges as significant factors in the perceived deficiencies in WASH infrastructure.

While the quantitative analysis suggested greater improvement in WASH infrastructure in experimental schools, the lack of statistical significance of the endline means suggests that the observed improvements did not present a clear advantage over control schools. The qualitative

results highlight the specific challenges faced by experimental schools. They are consistent with the quantitative results and highlight the importance of considering hygiene and sanitation concerns.

In summary, there were improvements in both school infrastructure and WASH infrastructure in both the control and experimental schools. However, the intervention used in the experimental schools led to more significant improvements compared to the control group. Nevertheless, when final results were carefully compared between the control schools and experimental schools, these improvements did not show a significant statistical difference. The students' qualitative input provided valuable insights into particular challenges that play a role in perceived deficiencies in WASH infrastructure.

7.2. ICT facilities

The analysis of the integration of technology in schools, focused on key metrics such as the number of laptops and computers, the presence of ICT laboratories, the availability of internet connections for teachers and students, the use of multimedia projectors, and opportunity for students to practice ICT in the laboratory.

Both the control schools and the experimental schools experienced an increase in the number of computers, with the experimental schools showing a more significant growth as shown in table 10. The baseline and endline data consistently showed 100% internet connection availability for teachers in both control and experimental schools. No significant changes were observed during the study period, indicating stable provision of this vital resource across all participating schools.

Table 10

Number of ICT facilities in experimental and control schools

Variables	Groups	Baseline N (schools)	Total number	End line N (schools)	Total number	Difference (Sig.)
Number of laptop and computers in schools	Control	10	504	10	515	NA
	Experimental	10	483	10	515	NA
Number of ICT Labs in schools	Control	10	21	10	21	NA
	Experimental	10	17	10	19	NA

Similar to teachers, internet connection availability for students remained constant at 100% in both the control and experimental schools. It is noteworthy that students accessed the internet mainly during lessons when its use was required, which highlights the strategic and purposeful use of this resource in the educational process. This trend shows that students in both control and experimental schools consistently had the same reliable internet access from the beginning of the study period till the end. This illustrates a situation where all students, regardless of school type, continued to have consistent internet coverage throughout the study period.

Table 11

Percentage of ICT facilities in the control and experimental schools

		N (schools)	**Available in what % of schools**	**N (schools)**	**Available in what % of schools**	**Difference (Sig.)**	Bhutan
Availability of internet connection for teachers	Control	10	100	10	100	NA	Bhutan
	Experimental	10	100	10	100	NA	
Availability of internet connection for students	Control	10	100	10	100	NA	Bhutan
	Experimental	10	100	10	100	NA	
Multimedia projector in school	Control	10	100	10	100	NA	Bhutan
	Experimental	10	100	10	100	NA	
Facility for students to practice ICT in lab	Control	10	100	10	100	NA	Bhutan

The multimedia projectors in both control and experimental schools were used in the process of teaching and learning. The 100% consistency indicates that the technological resource was well-established and maintained in all schools throughout the study period as shown in table 11. The availability of dedicated ICT laboratories for students' practice was consistently high both at the beginning and at the end of study period for both control and experimental schools. The sustained 100% presence of this facility underlines a permanent and stable infrastructure for student participation in ICT activities. However, the survey did not assess whether all participating schools were adequately equipped with projectors and computers. Although all schools reported having projectors and computers, the survey tool failed to capture details about adequacy of these devices in relation to class and student ratios.

In addition to quantitative data, the recurring theme of "engaging teaching methods" highlighted the significant role of teacher-driven strategies in fostering student interest.

Insights from focus group discussions provided valuable perspectives for integrating technology in experimental schools. The students expressed their appreciation for the engaging teaching methods, highlighted the use of teaching materials such as projectors and various multimedia materials. One group reported, “Class becomes interesting with the use of a projector,” emphasizing the impact of visual aids on their engagement. Another group remarked, "Teaching through video and eTLM facilities have helped us learn effectively". These quotes highlighted the importance of interactive and dynamic teaching approaches to stimulate students' interest and promote deeper understanding.

They emphasized the importance of interactive and dynamic teaching approaches and noted that teachers who used such methods make lessons more interesting. However, it is essential to recognize that no focus group discussion was conducted during baseline, limiting the comparison of students' perspectives over time. It was stated that the students valued the opportunity to learn using videos and eTLM facilities, which improved their understanding and engagement in the learning process.

Overall, the study shows a positive trend in technology integration in both control and experimental schools. Experimental schools, in particular, made significant progress in increasing the number of computers and ICT laboratories. The constant availability of internet, multimedia projectors, and ICT facilities in all schools suggests a commitment to integrating technology into educational settings during the study period. The students' qualitative perspectives highlight the importance of using teaching methods and multimedia tools to create dynamic and effective learning environments.

7.3. Attitude, Efficacy, Intention, Practice, concern and gender sensitivity

The integration of Gender and Inclusive Pedagogy (GIP) within educational frameworks necessitates a multifaceted approach, encompassing attitude, efficacy, intention, practice, concern, and gender sensitivity. This elucidates the critical importance of these elements in cultivating environments that support gender equality and inclusivity in schools which in fact, fosters students' performance.

This table 12 presents a comprehensive overview of key variables, including Attitudes, Efficacy, Intention, Practice, Concern, and Gender Sensitivity, measured at both baseline and endline in

control and experimental schools. The data is organized by the number of participants (N) in each group, along with the composite mean scores for each variable, providing valuable insights into the changes observed over the course of the study.

Table 12

Attitude, Efficacy, Intention, Practice, Concern and Gender Sensitivity in control and experimental schools

Variables	**Groups**	**Baseline**		**Endline**	
		N	**Composite Mean**	**N**	**Composite Mean**
Attitudes	Control	158	5.56	90	4.8
	Experimental	169	5.46	64	5.95
Efficacy	Control	158	4.82	90	4.58
	Experimental	169	4.65	64	4.95
Intention	Control	158	5.99	90	5.58
	Experimental	169	5.95	64	5.97
Practice	Control	158	2.98	90	2.99
	Experimental	169	2.89	64	3.13
Concern	Control	158	2.61	90	2.81
	Experimental	169	2.54	64	2.78
Gender Sensitivity	Control	158	2.67	90	2.71
	Experimental	*169*	*2.57*	*64*	*2.98*

7.3.1. Attitude

The baseline mean for the control group for attitude was 5.56 which decreased to 4.8 during the end line study as shown in table 12. For the experimental group the baseline mean was 5.46 which increased to 5.95 during the end line.

The experimental group showed an increase in mean attitude scores, suggesting a positive change in attitudes, while the control group exhibited a decrease in mean attitude scores, indicating a less favorable change. This difference in attitude changes between the control and experimental groups might be a result of intervention for the experimental group.

The experimental group were given four tiers of training on gender and inclusive pedagogy which had helped to change teacher's attitude towards gender inclusive pedagogy while the control group was not given any intervention. Teacher 2 mentioned:

> Gender and inclusive pedagogy is an educational approach that aims to create an inclusive learning environment where individuals of all genders and backgrounds feel valued and can fully participate. It involves recognizing and addressing gender-related biases, stereotypes, and inequalities in education. Using inclusive language and teaching materials that represent diverse gender identities and backgrounds in a classroom is an example of gender inclusive pedagogy.

This indicates that the four tiers of training on GIP for the experimental group had enhanced their understanding and changed their attitudes towards inclusive education. While for the control group there was no intervention for the teacher so the mean could have decreased slightly.

7.3.2. Efficacy of Teachers in the use of GIP

The baseline mean efficacy score for the control group at the beginning of the study was 4.82. while the mean efficacy score for the control group at the end of the study decreased to 4.58. The baseline mean efficacy score for the experimental group was 4.65 which increased to 4.95 during the end line study as shown in table 12.

The control group experienced a decrease in mean efficacy scores from baseline to endpoint, suggesting a decline in perceived efficacy. In contrast, the experimental group showed an increase in mean efficacy scores, indicating an improvement in perceived efficacy over the course of the study.

This suggests that the difference in the efficacy could be because of the interventions carried out for the experimental group indicating that the four tiers of training on the GIP proved to be successful to certain extent as it has helped in improving the self-efficacy of the teacher in the experimental groups. For example, Teacher 3 stated:

> After the introduction of GIP, classroom learning has transformed. Interactive teaching techniques like cooperative learning, simulations and experiential learning were used which actively engage students in the learning process. This shift from passive to active learning has enhanced comprehension, critical thinking, problem-solving skills, and long-

term retention. Moreover, GIP encourages accepting students with diverse cultures and experiences, fostering cross-cultural understanding. This not only enriches the learning experience but also prepares students for the globalized world.

This indicates the interventions have not only helped the teachers, but it has helped in enhancing student's participation and academic performance.

Further, a statement by Teacher 20 in the experimental group shared "Inclusive education is an educational philosophy and approach that emphasizes providing equitable opportunities and access to quality education for all students, regardless of their individual differences, backgrounds, abilities, or disabilities." indicating strong efficacy towards inclusiveness after the intervention.

7.3.3. Intention of Teachers towards GIP

The mean intention score for the control group at the beginning of the study was 5.99. The intention score for the control group at the end of the study decreased to 5.58 as shown in table 12. This decrease in the mean could be because they were not given any opportunity for the interventions

For the experimental group, the mean intention score at the beginning of the study was 5.95 and the mean intention score for the experimental group increased to 5.97 during the end line study as shown in table 12.

The control group showed a decrease in mean intention scores from baseline to endpoint, indicating a reduction in the reported intention. In contrast, the experimental group demonstrated a slight increase in mean intention scores, suggesting a small improvement in reported intention over the course of the study. The increase in the mean for the experimental group could be attributed to the four tier of interventions.

7.3.4. Practice

In the control group, the baseline mean of 2.98 indicates the average score at the study's outset, with a slight increase to 2.99 at the endline. Given that the control group did not undergo any intervention, the minimal change in means between baseline and endline suggests no substantial alteration in the control group's performance on the Practice variable during the study.

In the Experimental Group, the baseline mean of 2.89, slightly lower than the control group, saw a significant increase to 3.13 after the intervention. This notable improvement indicates a positive impact, emphasizing the intervention's meaningful influence on enhancing the experimental group's proficiency in the measured Practice variable. This observed change underscores the

intervention's effectiveness in positively influencing outcomes for the Experimental Group compared to their baseline performance.

The post-GIP training interview data collected from the teacher participants in the Experimental Group strongly corresponds with the quantitative results, confirming a substantial transformation in teachers' perspectives and practices. Participants expressed enhanced awareness and commitment to inclusive teaching methodologies, leading to transformative impacts on pedagogical approaches. Several key themes emerged during the interviews, with a notable focus on Inclusive Classroom Practices.

A majority of the participants reported the use of a range of strategies resulting from GIP training. These include use of collaborative strategy, selecting teaching materials representing diverse identities, creating physically accessible classrooms, and establishing ground rules for inclusive behavior, Teacher 3 stated, “As a result of GIP, classroom practice has transformed. Interactive teaching techniques like cooperative learning, simulations and experiential learning were used which actively engaged students in the learning process. This shift has enhanced comprehension, critical thinking and problem-solving skills.” Similarly, Teacher 10 shared, “When assessing student understanding, I would use a variety of methods that accommodate different learning styles and preferences. This might include essays, presentations, and creative activities.” The implementation of Gender and Inclusive Pedagogy (GIP) has not only diversified teaching strategies but has also created an inclusive classroom environment, fostering active student engagement and enhancing essential cognitive skills.

Teachers reported a significant change in classroom assessment methods, adopting inclusive strategies and various assessment tools. For instance, Teacher 26 mentioned, “I am applying different methods of assessment such as peer assessment, involvement of parents in assessment through telegram group, and different tools and techniques of assessment such as 321 paper, muddiest points, and other forms of assessment.” Similarly, Teacher 19 reported, “After the GIP training, I have started using a variety of assessment methods such as written assignments, oral presentations, group projects, and practical demonstrations. This allows students with different strengths and preferences to showcase their understanding.” Most of the participants revealed that the introduction of inclusive assessment methods has made a substantial difference in students’ participants. Non-participating students, who may have struggled with traditional assessment approaches, now find alternative ways to demonstrate their understanding and skills. The

integration of diverse assessment methods, including peer corrections and innovative tools, not only reflects a significant shift in assessment methods but also provides alternative avenues for non-participating students, ensuring a more comprehensive and inclusive evaluation of their understanding and skills.

Teacher participants acknowledged the necessity of using diverse teaching materials to cater to the diverse nature of learners. The shift is observed in considering individualized criteria for student success, moving away from a one-size-fits-all approach. For instance, Teacher 28 stated, "Learners are of diverse nature and so is their learning style. Hence, we teachers cater to all the diverse learners through varieties of pedagogy such as UDL, Cooperative learning and so on in which every individual in the classroom is given equal opportunities at all times." Teacher 27 shared similar practice who shared, "We are printing question paper in larger fonts for students with difficulty in vision. We give extra time for slow writers in unit tests and exams and we assess students' performance with different areas they are good at." The shift is observed in considering individualized criteria for student success, moving away from a one-size-fits-all approach.

GIP training has prompted some schools to review their school policies, emphasizing criteria recognizing the uniqueness of each student. Participants noted a shift in school culture and environment, with school management considering the inclusive classroom as a top priority. Teacher 19 shared, "Setting classroom norms that promote respect, empathy, and open dialogue, along with support from District Education Officers, reflects a shift towards a more inclusive policy." The impact of GIP training extends beyond individual practices to foster a broader transformation, leading schools to reevaluate their goals and policies. Teacher 12 reported, "I was thinking that the school should have the same goal for all students. After the training, I am concerned that one criterion cannot be applied to all. Now, our school is emphasizing on GIP. Eg. Revisiting school policy." This shift towards recognizing the uniqueness of each student and prioritizing inclusivity in classroom norms reflects a positive trajectory towards a more inclusive educational environment.

The convergence of endline survey data, post-test survey responses from Tier III and Tier IV, along with interview findings, strongly supports and reinforces each other. The posttest survey responses from Tier III and Tier IV training also indicated an evolution in understanding of Gender and Inclusive practice, showcasing a move towards more student-centered, diverse, and flexible assessment approaches. Both pretest and posttest responses consistently emphasized equity,

access, and differentiation in assessment practices, reflecting a promising awareness and advancement in teachers' understanding of inclusive assessment practices.

7.3.5. Concern

In both the Control and Experimental Groups, there is an increase in the mean, signifying an elevation in the concerns of the participants. On a scale where 4 represents extreme concern and 1 indicates no concern at all, the upward shift in mean scores across both groups indicates a heightened level of apprehension among participants regarding the implementation of Gender Inclusive Pedagogy.

In the Control Group, the baseline mean of 2.61 indicates the participants' average score at the study's commencement. The endline mean modestly increases to 2.81. While no specific intervention was applied to the control group, the marginal change between baseline and endline suggests a lack of substantial alteration in their performance throughout the study. The observed increase, though modest, may be attributed to factors outside the scope of a specific intervention.

Similarly, in the Experimental Group, the baseline mean of 2.54, slightly lower than the control group, indicates the participants' initial average score. Following the intervention, the endline mean increases notably to 2.78. The elevation in mean scores across both groups may indicate an increased awareness and concern among the participants after training in the Experimental Group and a potential impact of Ministry of Education and Skills Development initiatives in creating awareness about inclusive practices in the Control Group.

After the GIP intervention, teachers demonstrated a clear understanding of GIP but expressed significant concerns about addressing challenges for fostering more inclusive schools. Post-GIP training interviews revealed common concerns among participants, such as limited time, syllabus coverage, large class sizes, resource constraints, technology and assessment limitations, and inadequate infrastructure. For instance, Teacher 1 expressed the challenge of applying methods due to extensive syllabus coverage and limited time. Similarly, Teacher 23 highlighted challenges such as large class sizes, resource constraints leading to unavailability of adequate technologies during ICT classes, and insufficient time for assessment and evaluation.

These perspectives align with the pre-and post-test data collected from participants after each Tier of training. The recurring themes include time constraints and syllabus coverage, resource limitations, curriculum alignment, awareness and stigma, staff workload and preparation time,

classroom settings, among others. The qualitative insights complement and enrich the quantitative findings, providing a comprehensive understanding of the concerns voiced by teachers in the context of inclusive education implementation.

7.3.5. Gender Sensitivity

In the Control Group, the baseline mean was 2.67, representing the average score of participants at the beginning of the study. The endline mean showed a modest increase to 2.71 as shown in table 12. Since the control group did not undergo any intervention, the minimal change in means between baseline and endline suggests a lack of substantial alteration in the control group's performance on the Gender Sensitivity variable over the study duration. It's plausible that external influences, such as ongoing educational initiatives, might have contributed to this slight enhancement in the control group's average score on the Gender Sensitivity variable.

In the Experimental Group, the baseline mean was 2.57, indicating a lower initial average score compared to the control group and signaling a slightly lower baseline score on the Gender Sensitivity variable. Following the intervention, the endline mean surged notably to 2.98 as shown in table 12. This substantial increase implies a positive and meaningful impact of the intervention on the Experimental Group's performance in the Gender Sensitivity variable. The observed change suggests that the intervention effectively addressed and improved the participants' awareness and sensitivity to gender-related aspects. This significant positive shift in mean scores underscores the effectiveness of the intervention in positively influencing the outcomes for the Experimental Group in comparison to their baseline performance on the Gender Sensitivity variable.

The post GIP training interview data corroborates the quantitative findings, revealing a noteworthy improvement in gender sensitivity among participants' post-GIP training. Several key themes emerge from their responses, suggesting a positive shift towards promoting equitable participation and fostering a gender-inclusive environment.

Participants expressed a commitment to encouraging all students, regardless of gender, to actively engage in discussions and activities. This is reflected in participants' approach of mixed-gender seating arrangements, creating a conducive learning environment with various teaching, learning, and assessment strategies tailored to diverse student needs. For instance, Teacher 17 shared, "Firstly we ensure that sitting arrangements are done as a mixed gender group with mixed ability. We use various teaching, learning and assessment strategies for effective teaching so that we cater

to the needs of diverse students." After the implementation of GIP, both genders participated more equally, with teacher 13 noting a large difference in classroom participation. Similarly, teacher 19 highlighted that, despite traditionally better performance by females, GIP strategies have led to increased participation by males in classroom activities.

The use of gender-neutral language and teaching materials is a common practice among participants, as highlighted by most of the participants. Teacher 2 emphasized the inclusion of diverse gender identities and backgrounds in content selection, ensuring representation in history classes. Similarly, Teacher 10 and Teacher 12 stressed the importance of inclusive language in teaching materials and discussions while incorporating student-centered methods with mixed-gender and ability groupings. The widespread adoption of gender-neutral language and inclusive teaching materials, as underscored by most of the participants, signifies a collective commitment towards fostering diversity and representation in the educational environment.

7.4. Classroom Observation

Table 13

Classroom Observations

Variables	Groups	Baseline		Endline		Sig. (Difference)
		N	Composite Mean	N	Composite Mean	In baseline and end line
Students' participation in classroom	Control	10	3.10	10	3.11	0.933
	Experimental	10	3.26	10	3.69	0.027

7.4.1. Students' participation in classroom

This analysis delves into a study comparing the impact of an intervention on student participation in the classroom, utilizing two distinct groups: a control school and an experimental school. The primary metric for evaluation was the composite mean score of student participation, which served as a quantitative measure of engagement levels within the classroom setting.

The control group, which did not receive any specific intervention aimed at enhancing student participation, exhibited minimal change in their composite mean scores from the baseline 3.10 to the endline 3.11 as shown in table 13. The statistical analysis revealed a significance level of 0.933 for this difference, markedly above the commonly accepted threshold of 0.05 for statistical

significance. This high p-value indicates that the slight variation observed in the control school's scores can likely be attributed to random chance, suggesting no meaningful impact on student participation without the intervention.

Conversely, the experimental group, which was subjected to a targeted intervention designed to increase classroom participation, showed a noteworthy improvement. Their composite mean scores rose from 3.26 at baseline to 3.69 at endline. The significance of this change, denoted by a p-value of 0.027, falls below the 0.05 threshold, marking it as statistically significant. This result strongly suggests that the intervention employed with the experimental group had a positive and meaningful effect on enhancing student participation in the classroom.

The quantitative data substantiated the findings since many teachers have expressed the same opinion on increased classroom participation due to implementation of gender and inclusive pedagogy in the process of teaching and learning. Teacher 3 remarked that “Introvert and non-participating children began to open up within their circle of friends even though they are not really participating in a class”. Teacher 18 stated that “Students became more interactive in the class compared to the past”. Majority of the teachers expressed that girls started participating more due to gender and inclusive pedagogy being employed in the process of teaching and learning.

The findings from this study underscore the potential efficacy of targeted Gender and Inclusive interventions in boosting student engagement and participation. For educators and policymakers, the significant improvement observed in the experimental group highlights the value of implementing evidence-based strategies to foster an interactive and participative learning environment. Furthermore, the stark contrast in outcomes between the experimental and control schools serves as a compelling argument for the proactive pursuit of innovative pedagogical approaches aimed at engaging students more deeply in their learning processes.

7.4.2. Teaching Learning Activities

Table 14

Initiating classroom teaching learning activities

Variables	Groups	Baseline		Endline		Sig. (Difference) in baseline and end line
		N	Composite Mean	N	Composite Mean	
Teachers' teaching learning activities initiated	Control	10	3.58	10	3.57	.729
	Experimental	10	3.66	10	3.9	0.150

This study examined the impact of an intervention on teachers' teaching-learning activities, comparing outcomes between a control and an experimental group consisting of 10 schools each, ensuring a balanced comparison across two measurement points: baseline. The key metric for assessment was the composite mean score, representing the level of teaching-learning activities initiated by teachers. This quantitative measure allows for a detailed evaluation of the intervention's effectiveness on teaching practices.

For the control group, which did not receive any specific intervention aimed at enhancing teaching-learning activities, the results indicate a negligible change in their composite mean scores from the baseline 3.58 to the endline 3.57 as shown in table 14. The statistical analysis yielded a significance level of 0.729 for this difference, significantly exceeding the standard threshold of 0.05 for statistical significance. This high p-value suggests that the minor variation observed in the control group's scores is likely attributable to random fluctuation, indicating no meaningful impact on teachers' teaching-learning activities in the absence of the intervention.

In contrast, the experimental group, which was subjected to a targeted GIP intervention designed to improve teaching-learning activities, showed a greater improvement. Their composite mean scores increased from 3.66 at baseline to 3.9 at endline. Despite the apparent improvement, the significance of this change, with a p-value of 0.150, does not meet the conventional cutoff of 0.05 to be considered statistically significant. However, the p-value is considerably closer to the threshold than that of the control group, suggesting a trend towards a positive effect of the intervention, even though it cannot be conclusively deemed statistically significant based on this dataset.

7.4.3. Classroom Assessment

Table 15

Student Assessment in classroom

Variables	Groups	Baseline	Endline			
		N	Composite Mean	N	Composite Mean	Sig. (Difference) In baseline and end line
Student Assessment in classroom	Control Experimental	10 10	3.13 3.33	10 10	3.23 3.46	0.945 0.568

Since the control group did not receive any targeted GIP intervention aimed at improving student assessment practices, there was a slight increase in the composite mean scores from baseline 3.13 to endline 3.23 as shown in table 15. The statistical analysis showed a significance level of 0.945 for this difference, indicating that the change is not statistically significant. This high p-value suggests that any observed variation in the control group's scores is likely due to random chance rather than a meaningful improvement in student assessment practices. Essentially, without the intervention, the control group did not experience any significant change in how student assessments were conducted or implemented in the classroom.

The experimental group, which underwent a specific intervention GIP designed to enhance student assessment practices, showed an increase in their composite mean scores from 3.33 at baseline to 3.46 at endline. However, the significance of this change, as denoted by a p-value of 0.568, does not meet the conventional threshold of 0.05 required to declare statistical significance. While this result indicates a positive trend—suggesting that the intervention may have had some impact on improving student assessment practices—the lack of statistical significance means we cannot conclusively attribute the observed improvement to the intervention with high confidence.

7.4.4. ICT usage in classroom

Table 16

Use of ICT in the classroom

Variables	Groups	Baseline		Endline		
		N	Composite Mean	N	Composite Mean	Sig. (Difference) In baseline and end line
Use of ICT in classroom	Control	10	2.42	10	2.45	0.843
	Experimental	10	2.85	10	3.75	0.121

In the control group, the composite mean score exhibited a minimal increase from 2.42 at baseline to 2.45 at the endline in the use of ICT in the classroom as shown in table 16. The significance level associated with this change was 0.843, indicating that the difference is not statistically significant. This high p-value suggests that the slight variation observed in the control group's scores can most likely be attributed to random chance rather than any meaningful improvement in the use of ICT. It implies that without targeted interventions, the utilization of ICT in classroom settings remains relatively unchanged.

The experimental group, on the other hand, was subjected to an intervention designed to foster greater use of ICT in the classroom. This group's composite mean score saw a more notable increase from 2.85 at baseline to 3.75 at endline. Despite this substantial improvement, the significance level of 0.121, while indicating a positive trend, does not fall below the conventional threshold of 0.05 required to declare the change statistically significant. Nevertheless, the p-value is closer to significance than that of the control group, suggesting that the intervention likely had a positive impact on enhancing the use of ICT in the classroom among the experimental group, even if this result does not meet the strict criteria for statistical significance.

7.4.5. Classroom Inclusion

Table 17

Inclusion in classroom

Variables	Groups	Baseline		Endline		
		N	Composite Mean	N	Composite Mean	Sig. (Difference) In baseline and end line
Inclusion in classroom	Control	10	1.94	10	2.01	0.605
	Experimental	10	1.96	10	1.58	0.470

This dataset outlines the results of a study examining the impact of GIP intervention on the inclusion in classroom settings, with the focus being on how inclusive practices were before and after the intervention. The study utilized a control group and an experimental group, each comprising 10 different schools located in different parts of Bhutan. The main metric for evaluation was the composite mean score representing the level of inclusion within classroom environments at two distinct points: baseline and endline. The significance of observed differences was also calculated to assess the statistical relevance of the changes.

In the control group, which did not receive any specific intervention aimed at enhancing inclusion, there was a slight increase in the composite mean score from 1.94 at baseline to 2.01 at endline as shown in table 17. The significance level associated with this change was 0.605, indicating that the difference is not statistically significant. Such a high p-value suggests that the minor variation observed in the control group's scores is likely due to random fluctuations rather than a genuine improvement in inclusive practices. This result implies that without targeted intervention, the extent of inclusion in classroom settings may remain largely unchanged.

The experimental group, which underwent a specific intervention designed to improve inclusion, displayed a decrease in their composite mean score from 1.96 at baseline to 1.58 at endline. This result is somewhat counterintuitive as the intervention was expected to enhance inclusion, yet the significance level of 0.470, while not meeting the conventional threshold for statistical significance, still indicates that this negative change is not statistically significant. This decrease suggests that the intervention, contrary to its intent, did not facilitate an improvement in inclusion and may have inadvertently led to practices or perceptions that were less inclusive.

7.4.6. Teachers talk time in Teaching and Learning

Table 18

Teacher's talk time in the classroom

Variables	Groups	Baseline		Endline		Sig.(Difference)
		N	Composite Mean	N	Composite Mean	In baseline and end line
Teacher talk time	Control	10	3	10	3.1	0821
	Experimental	10	3	10	3.3	0.169

This dataset explores the effect of an intervention aimed at modifying "teacher talk time" in the classroom, comparing outcomes between a control group and an experimental group. Both groups started with an identical baseline composite mean score of 3, indicating a level of teacher talk time before any intervention. The study aimed to see if this intervention could effectively reduce teacher talk time, presumably to allow for more student engagement and interaction, or to adjust the balance of classroom dialogue in some manner deemed educationally beneficial.

In the control schools, there was a slight increase in the composite mean score from 3 at baseline to 3.1 at endline in the teachers' talk time. The significance level associated with this change was 0.821, indicating that the difference is not statistically significant. This high p-value suggests that the minimal change observed within the control group's scores can likely be attributed to natural variation or measurement error rather than any real change in teacher talk time. Essentially, without targeted intervention, teacher talk time remained largely unchanged, as expected.

The experimental group showed an increase in their composite mean score from 3 at baseline to 3.3 at endline in teacher's talk time. The significance level of this change was 0.169, which, while indicating a trend towards increased teacher talk time, does not reach the conventional threshold of 0.05 for statistical significance. This result is intriguing because it suggests the intervention may have led to an increase in teacher talk time rather than a decrease or no change at all. However, the lack of statistical significance means we cannot confidently assert that the intervention caused this increase; it merely indicates a potential trend that warrants further investigation.

7.4.7. Student's talk time in learning

Table 19

Student's Talk Time

Variables	Groups	Baseline N	Baseline Composite Mean	Endline N	Endline Composite Mean	Sig. (Difference) In baseline and end line
Student talk time	Control	10	3	10	3	0.767
	Experimental	10	2.34	10	2.72	0.116

For the control group, the composite mean scores remained constant at 3 from baseline to endline in student's talk time. The calculated significance level for this negligible change was 0.767, clearly indicating that the difference observed is not statistically significant. This outcome suggests that in the absence of targeted interventions, student talk time is likely to remain unchanged. The high p-value underscores the probability that any minor fluctuations are due to chance rather than any systematic change in student engagement or participation levels.

In contrast, the experimental group, which underwent the intervention, exhibited a notable change in student talk time. The baseline composite mean score was 2.34, which increased to 2.72 at endline. The significance level associated with this change was 0.116, suggesting that while there was a positive trend towards increased student talk time as a result of the intervention, the change does not meet the conventional threshold for statistical significance (typically set at $p < 0.05$). Despite the lack of statistical significance, this increase in the experimental group's score suggests a potential impact of the intervention on promoting greater student participation in classroom discussions, warranting further investigation.

7.5. Students' Academic Achievement

To assess the impact of intervention training on teachers and its subsequent effects on student performance, this study employed a quasi-experimental design with a single group of students assigned to both control and intervention conditions. The mid-term examination performance, conducted before the intervention, was considered as baseline data, representing the control variable. Similarly, the student performance during the annual examination, conducted after implementing the intervention training for teachers, was regarded as endline data, representing the

intervention variable. These variables were meticulously measured and utilized to establish a comprehensive comparison within the same group of students post-intervention.

The intervention study was conducted on 1615 students from 10 schools in different parts of Bhutan. All teachers trained in Gender and Inclusive Pedagogy taught Class VII and IX. The study population was 46.1% male and 53.9% female from Class VII and 55.7% male and 44.3% female from Class IX.

Table 20

Frequencies Statistics of student performance

	Mid-Term Examination marks	Annual Examination marks
N	1615	1615
Mean	63.52	65.86
Median	62.50	65.00
Std. Deviation	10.21	9.797
Variance	104.2	95.82
Skewness	.342	.342
Std. Error of Skewness	.061	.061
Range	56.38	55.38

The student achieved an average of 63.52 on their mid-term examination and 65.86 on their annual examination. While most of the student's marks in the mid-term examination were within 10.21 point of the mean, the marks after the annual examination marks were within 9.79 points of the mean as shown in table 20. There is a variance of 104.20 in mid-term examination marks and the variance of 95.82 in annual examination marks.

Figure 5.

Mid-term Marks of student (before intervention)

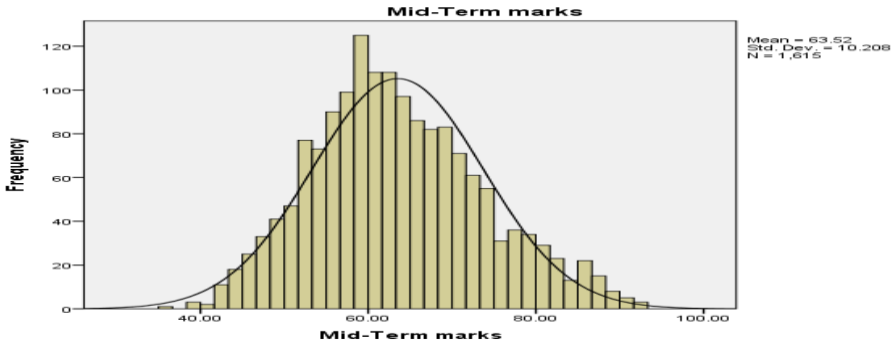
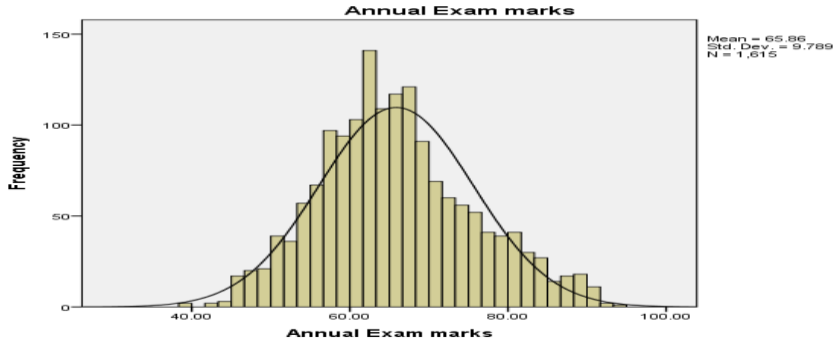


Figure 6.

Annual Exam marks (after intervention)



Overall, the descriptive statistics show that both the mid-term examination marks and the annual examination marks are normally distributed and show a slight right- skewing (0.342) as shown in figure 5 and 6. The mean and median are very close, indicating that the data are evenly distributed. The standard deviation illustrates the variability in marks between the midterm and the annual examination, with the mid-term examination showing a greater spread than the more closely clustered marks of the annual examination. Thus, this suggests that the performance of the overall student population is more consistent after the intervention and has shown improvement.

A Wilcoxon signed-rank test was conducted to compare the student's performance before and after the intervention using the following null and alternative hypothesis:

- **H_0:** There is no statistically significant difference between mid-term and annual examination marks of the student population.
- **H_1:** There is a statistically significant difference between mid-term and annual examination marks of the student population.

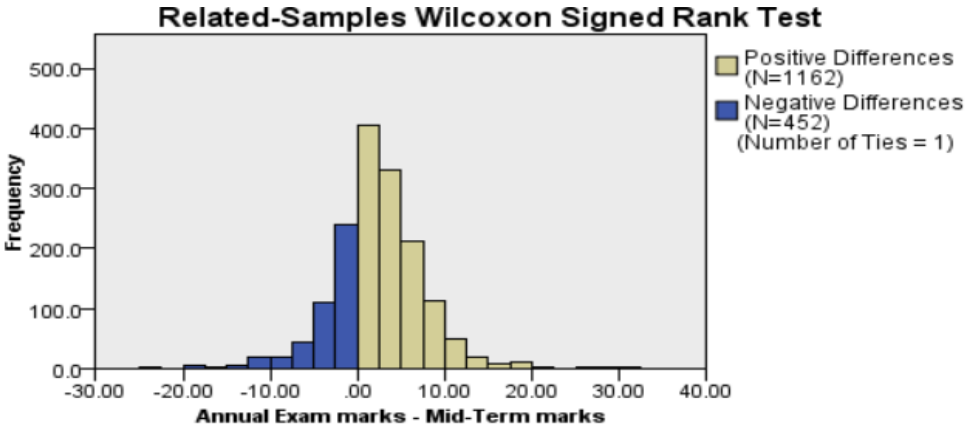
The test showed that the student performance improved statistically significantly after the intervention training ($Z=18.34$, $p=0.00$). Because the difference is large and positive, overall student performance improved after the intervention.

Figure 7.

Hypothesis test summary of student performance

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between Mid-Term marks and Annual Exam marks equals 0.	Related-Samples Wilcoxon Signed Rank Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.



Total N	1,615
Test Statistic	996,021.000
Standard Error	18,726.917
Standardized Test Statistic	18.389
Asymptotic Sig. (2-sided test)	.000

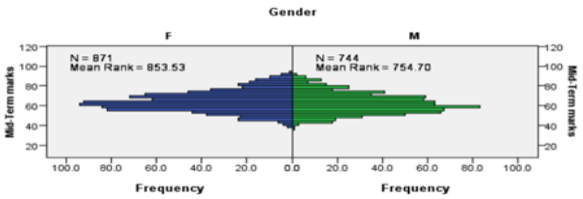
7.5.1. Gender wise performance

The Mann-Whitney U test was used to compare the annual exam marks and mid-term marks of male and female students using the following null and alternative hypothesis:

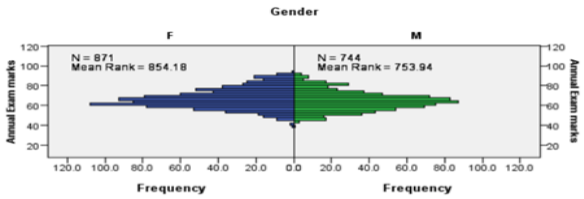
- **H_0:** There is no difference between mid-term and annual exam marks among the gender.
- **H_1:** There is difference between mid-term and annual term marks among the gender.

Figure 8

Independent – samples Mann-Whitney U Test (Gender performance)



Total N	1,615
Mann-Whitney U	363,668.000
Wilcoxon W	743,424.000
Test Statistic	363,668.000
Standard Error	9,341.690
Standardized Test Statistic	4.245
Asymptotic Sig. (2-sided test)	.000



Total N	1,615
Mann-Whitney U	364,235.000
Wilcoxon W	743,991.000
Test Statistic	364,235.000
Standard Error	9,341.687
Standardized Test Statistic	4.306
Asymptotic Sig. (2-sided test)	.000

The results showed that there was a statistically significant difference between the two groups in both cases. The female students had higher mean ranks for both the annual exam marks (854.18) and mid-term marks (853.53) than the male students with 753.94 and 754.70, respectively. The p-values for both tests were less than 0.05, indicating that the difference in mean ranks was statistically significant. The results of the Mann-Whitney U test suggest that female students have higher annual exam marks and mid-term marks than male students. This difference is statistically significant. The possible reason for this difference could be:

i. Female students may be more motivated to do well in school.
ii. Female students may have better study habits.
iii. Female students may be more focused on their academic goals.
iv. Female students may receive more support from their families and friends.

Correlation

Table 21

Spearman correlation analysis (mid-term marks and annual exam marks).

			Annual Exam marks.	Mid-term marks
Spearman's rho	Annual Exam marks	Correlation Coefficient	1.000	.824**
		Sig. (2-tailed)	.	.000
		N	1615	1615
	Mid-Term marks	Correlation Coefficient	.824**	1.000
		Sig. (2-tailed)	.000	.
		N	1615	1615

**. Correlation is significant at the 0.01 level (2-tailed).

The Spearman correlation analysis of mid-term marks and annual exam marks showed a very strong positive correlation (rho=0.824). The p-value for the correlation coefficient is 0.000, which is less than 0.05. This indicates a robust and statistically significant relationship between mid-term and annual exam performance.

The correlation coefficient of 0.824 suggests a positive linear association between mid-term and annual exam marks. As mid-term marks increase, there is a strong tendency for annual exam marks to also increase. The p-value of less than 0.01 indicates that this correlation is unlikely to be due to random chance, further supporting the significance of the relationship.

Similarly, the qualitative findings from the interviews complement the strong correlation identified in the quantitative analysis between mid-term and annual exam marks. The patterns observed in both data sets provide a comprehensive understanding of how intervention training influenced teaching methods and student outcomes, as articulated in the experiences and perceptions shared by teachers and students participants during the interview. The interview responses from both teacher and student participants consistently highlighted significant improvements in learning outcomes following the intervention of Gender and Inclusive Pedagogy (GIP). For instance, Teacher 12 highlighted, "There was a noticeable difference in classroom learning before and after the intervention of GIP." Teacher 18 echoed similar sentiments, stating, "Our results this year are better than last year, most probably because of GIP intervention."

The participants further emphasized the transformative effects of GIP, noting a significant increase in student participation from an initial average in classroom activities. Teacher 19 reported, “On average, earlier we would experience 50% of the students not participating actively in classroom activities but with the GIP strategies in practice, students’ participation has enhanced gradually, and even the outcome of academic performances improved.” This enhanced participation is not only the evidence of the success of GIP strategies but also contributed to a subsequent improvement in academic performances. For instance, Student 12 stated, “Teachers nowadays use different methods to teach and test us, and it has really helped us participate more in class and do better in exams.”

The teachers' supportive and inclusive approach, along with creating opportunities for active involvement in classroom activities, not only enhanced student engagement but also catalyzed overall improvements in learning outcomes. This finding underscores the interconnectedness of

using diverse teaching methods, increasing student involvement, and achieving positive academic results within the GIP intervention. Furthermore, the post-test data from Tier IV training on GIP showed that teachers gained a deeper understanding of inclusive practices, emphasizing personalized learning, collaboration, and ensuring equity and inclusion for all learners. This, in turn, resulted in a continuous improvement in students' learning and attendance.

Overall, the data indicates the effectiveness of the intervention training in enhancing student performance. The findings emphasize the positive impact of the Gender and Inclusive Pedagogy (GIP) intervention, as supported by both quantitative measures and qualitative insights from teacher and student participants. The improved learning outcomes, increased student participation, and positive correlations between mid-term and annual exam marks collectively highlight the success of the GIP intervention in fostering a conducive learning environment. This holistic approach, encompassing diverse teaching methods and inclusive practices, has not only elevated student engagement but also contributed to significant advancements in academic achievements. The finding suggests that interventions promoting inclusive pedagogical strategies can lead to positive changes in student performance, with implications for designing future educational initiatives.

8. Limitations

The research faced several limitations that could potentially affect the interpretation and generalizability of our results. Limitations are listed below:

8.1. Short Training Duration

With only four days of training for each tier of intervention, the study may not have given participants enough time to fully understand and internalize the new approaches. This raises concerns about the long-term sustainability of the intervention's impact.

8.2. Online Delivery for Tier 1 and Tier 3 Interventions

Tier one and tier three training were conducted virtually due to Covid restrictions in traveling and gathering. Delivering critical aspects of the intervention online may have compromised the effectiveness of knowledge transfer and skill development. Online learning lacks the interactive

and personal touch of in-person learning, potentially impacting participant engagement and learning outcomes.

8.3. Attrition in the Experimental School

The significant decline in the number of participants at the endline due to various reasons such as transfers, resignation and leaving to Australia, and medical leave may raise concerns about the representativeness of the final data. This reduces the sample size and weakens the generalizability of the results to the entire experimental school population.

8.4. Limitation of School Selection

This study is conducted in selected 10 experimental and 10 control schools and its findings may be influenced by the demographics of the selected schools. A diverse sample from across the country is required to get a broad range of perspectives.

8.5. Resource Dependency for GIP Success

The success of GIP in schools may depend on the availability of resources, both financial and human. There is evidence of lack of resources, which may affect the successful implementation and sustainability of the GIP practices in schools.

8.6. Adequacy of Projectors and Computers

The survey did not assess the adequacy of projectors and computers in relation to class and student ratios. While all schools reported possession of these devices, the survey tool failed to capture nuanced details regarding their sufficiency, leaving room for further exploration into the optimization of technological resources.

9. Challenges

While Gender and Inclusive Pedagogy (GIP) has been implemented successfully in many schools, other schools are still in the process of achieving this goal. Schools in Bhutan, like many other developing countries, have been making efforts to make schools inclusive. The participants of this study were asked about the challenges faced with implementing Gender and Inclusive Pedagogy, most of them responded the same challenges such as covering vast syllabus in limited time, lack

of resources, difficulty in understanding students' learning styles, difficulty in communicating with parents, inadequate ICT lab facility and poor internet connectivity, pressure from school administrators to complete other tasks on time, among others. It was also expressed that within the limited time, assessing individual contributions in cooperative learning groups was difficult. Participants needed to plan and allocate sufficient time for group work, which was challenging in a packed curriculum. Similarly, cooperative learning requires well-designed activities and appropriate resources for which participants had to invest time and effort into creating and finding suitable materials and designing tasks that promote collaboration. For instance, Teacher 13 stated, "Some strategies require preparation of different approaches suitable for different children and therefore, with limited preparation time, it seems difficult to manage required materials". The participants also reported the challenges faced in assessment. Teacher 7 expressed, "It's difficult to assess as our system demands all students to be assessed by doing the same test such as class test, midterm and annual examination".

However, participants also shared that they could somehow manage time by adjusting the class with other subject teachers and plan short lessons. Further preparation and resource management were mostly done at home during weekends and after school. Participants also shared that students' lack of interest, lack of participation in classroom activities, and lack of resources were some of the challenges they encountered in the beginning. However, after receiving 4 tiers of training, they expressed that they were able to make the lesson interesting by incorporating real-world applications and giving students some freedom in their educational decisions. They were also able to create a secure and welcoming learning atmosphere, employing active learning techniques, and giving frequent feedback. With the use of cooperative learning roles, where each student switches their roles in different group work, participants were able to engage all the students meaningfully. Further, they reported that they explored substitute resources and modified their teaching strategies to make the most of what they learnt through GIP training. The participants allowed the day scholars to bring phone, and dispersed them into groups and made them use some digital learning tools such as padlets, google classroom, speakers, etc. and provided printed handouts, charts and let them explore on their own and present.

Despite the numerous changes and improvement, a majority of the student and teacher participants indicated that schools continue to encounter challenges, including timely syllabus coverage, insufficient resources, a lack of proper ICT lab facilities, and poor internet connectivity.

10. Recommendation

- This study recommends the continued emphasis on teacher professional development, collaborative efforts among teachers to share best practices, and institutional support for the implementation of inclusive pedagogical approaches.
- Policymakers and colleges of education should prioritize the integration of inclusive teaching methods and practices into teacher training programs and curriculum development.
- Educational leaders should provide ongoing support for teachers as they implement inclusive practices in their classrooms.
- Government and educational organizations should invest in teacher professional development programs and allocate resources and support for such initiatives.
- Conduct a longitudinal study to observe the sustained effect of GIP practices over time. This would provide a comprehensive knowledge of the implementation of GIP effectiveness in schools.
- Further research could explore the impact of technology integration on student learning outcomes and teacher practices.

11. Conclusion

In conclusion, this research has initiated a comprehensive investigation into the impact of Gender and Inclusive Pedagogical (GIP) approaches on the participation and learning achievement of students in grade VII and IX in Bhutan, particularly during the challenging period of the COVID-19 pandemic and beyond. To strengthen the research objectives, the study aimed to measure the impact of GIP interventions on teachers' attitudes, efficacy, and practices while assessing the extent of their impact on student participation and learning achievement. The research also aimed to identify potential differences in impact based on gender and other backgrounds, and ultimately determine sustainability mechanisms for GIP approaches at both country and regional levels.

The research found positive changes in teachers' attitudes, efficacy, and teaching practices after implementing GIP approaches. In particular, improvements in student participation and learning were observed, highlighting the potential benefits of targeted teacher training in inclusive

pedagogy. The results indicated promising trends in technology integration and the adoption of inclusive teaching methods, and suggested avenues for future educational development.

The study underscored the need for a nuanced understanding that integrates both quantitative and qualitative dimensions. Despite improvements observed, the lack of significant differences in certain areas suggests that GIP interventions, along with other contributing factors, may require further refinement for more noticeable and widespread impacts. The positive trends in technology integration and teacher-driven strategies offer promising directions for future development and research in inclusive education.

The positive changes observed in teachers' attitudes, practices, and student outcomes are consistent with the research objectives and confirm the potential impact of GIP approaches on both teachers and students. The study provides valuable insights into the broader discourse on inclusive education and highlights the transformative potential of targeted interventions.

The study acknowledges challenges such as short training durations, limitations in online delivery, teacher turnover in the experimental school, and possible biases. These limitations provide opportunities for future research refinement and highlight the need for ongoing support and adaptive strategies in the effective implementation of GIP approaches.

The study calls for continued efforts to address challenges, improve interventions and explore sustainable mechanisms at both country and regional levels. The recommendations emphasize continuous teacher professional development, multi-stakeholder collaboration, and institutional support to promote a conducive and sustainable learning environment.

The study concludes that despite the challenges, the positive changes observed among teachers and students indicate progress toward more inclusive educational practices. The study ends on a positive note, highlighting the potential benefits of ongoing efforts to refine interventions and create a learning environment that prepares students for a diverse and globalized world. As Bhutan continues its commitment to quality education, integrating of evidence-based GIP practices holds the potential to move the country closer to the ideals of inclusivity, gender equity and holistic student development outlined in its educational goals and policies.