

ASSESSMENT OF INPUT QUALITY IN SPECIAL EDUCATION INSTITUTIONS OF PUNJAB: A QUANTITATIVE ANALYSIS

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ABSTRACT

Although recent years have seen global attention on inclusive education, quality assessment remains understudied in context of special education institutions in developing countries. This study measures the quality of input in special education institutions across the Punjab, Pakistan. It comprised five major indicators of quality as including learners' characteristics, human resources, infrastructure, teaching materials, and curriculum. This study adopts a quantitative approach, with a questionnaire based on UNESCO's quality education model, surveying special education teachers in Punjab. A multistage stratified random sampling technique was used to select a sample of 360 teachers from 36 institutions. Data were analyzed using descriptive statistics, independent sample t-tests, and one-way ANOVA in SPSS. Results show that, overall, input quality is at moderate to unsatisfactory levels, mainly due to resource and institutional support constraints. Although gender, qualification, teaching experience and designation had no impact on teachers' perceptions, workload was a significant predictor in all aspects of input quality. These results indicate that quality deficiencies are systemically rather than individually driven, with policy implications for resource allocation, workload alleviation and systemic support for effective and inclusive special education programs in Punjab.

Keywords: quality, special education, Punjab, quantitative study

INTRODUCTION

Education is globally recognized as the foundation for social progress, human development, and economic growth. The United Nations' Sustainable Development Goal 4 (SDG4) calls for inclusive and equitable quality education for all by 2030, elevating education to the forefront of the global agenda (UNESCO, 2015; The World Bank (2018) reported that millions of children in low- and middle-income countries are completing their education without basic literacy and maths skills - a phenomenon known as 'learning poverty.

Globally, education systems face a learning crisis, whereby rising enrollment has not been matched by improvements in learning outcomes. The World Bank (2018) reported that millions of children, especially in low- and middle-income countries, attend school without mastering foundational skills such as reading, numeracy, and problem-solving. UNESCO (2021) emphasized that this crisis is not only quantitative but also qualitative: schools often fail to prepare children for the complex social, moral, and professional challenges of the 21st century.

With increasing institutional autonomy in education, there is an increasing need for quality assurance (QA) mechanisms. In fact, quality assurance is an important accountability tool to ensure that qualifications are related to real competencies, and to ensure a graduate meets the requirements of employers and regulators (Cedefop, 2011). It is necessary to gain the national, social and local level of goals for attaining the success of a country.

Special education plays a vital role in ensuring equitable learning opportunities for students with diverse needs and is considered a key component of inclusive education systems (UNESCO, 2020). In developing contexts such as Pakistan, the effectiveness of special education institutions largely depends on the availability and quality of input factors, including trained human resources, infrastructure, curriculum, and teaching materials (UNICEF, 2019). Punjab's uneven resource allocation and institutional support hampers equitable service delivery, making systematic evaluation of input quality not only desirable but necessary for evidence-informed policy change (Government of Punjab, Special Education Department, 2022; Ainscow, 2016).

The present study is aimed at analyzing the quality of the inputs in special education institutions in Punjab in terms of the resources available, teaching methods used, infrastructure and support services provided. It will also aim to pinpoint the existing strengths and weaknesses of the input methods employed in these institutions and gain a deeper understanding of what needs to be improved. Based on the findings the study will suggest some evidence-based recommendations for improvement of overall quality of inputs and for more effective and inclusive educational practices in all special education institutions in Punjab. It addresses the following research questions, a) what is the quality of input in the institutions if special education in Punjab, b) what are the gaps and strengths in the input methods in the institutions if special education in Punjab and, lastly, c) What is the evidence-based recommendations for improving input quality in special education institutions of Punjab.

This research paper is based on Evaluation of input quality in special education institutions of Punjab through systematic assessment of resources, practices, and standards. Then to Identifying gaps and strengths to develop evidence-based recommendations for improving institutional quality and effectiveness.

LITERATURE REVIEW

Broader Conceptualizations of Quality

A number of scholars have attempted to explain some meanings of quality. For instance, Harvey & Green (1993) and Harvey & Knight (1996) conceptualize quality as exception (excellent mark), as perfection or zero defects (ideal notion), fit for purpose, a meaning commonly adopted in education (NCHE, 2014); as value for money (economic version of quality) and as transformation (value addition). Therefore, professionals, students, policy makers, university managers and academicians will define quality differently, and their perceptions will determine their practice in teacher education and training.

Quality holds diverse meanings across stakeholders, shaping practices in teacher education and training. Harvey and Green (1993) and Harvey and Knight (1996) outline key dimensions: quality as exception (an excellent benchmark), perfection or zero defects (an ideal state), fit for purpose (widely used in education; NCHE, 2014), value for money (an economic lens), and transformation (adding value). Professionals, students, policymakers, university managers, and academicians thus interpret and apply quality differently.

In the educational discourse when we linked quality with education the emphases of the excellence take a new shape. For example (UNESCO, 2025) commitment to quality is to take an interdisciplinary approach with specific context bound priorities and strategies to achieve quality. UNESCO also called for improvement in the quality of education through the diversification of content and methods, and promotion of universally shared values. UNESCO, 2025 defines the quality with a human rights approach which satisfies basic as lifelong needs. The separate definition of education and

quality has reinforced the notion of quality, its important and geared support for institutional mechanism. I agree that the quality purpose is to achieve what education is meant to achieve, however, a greater emphasizes and mechanism for quality assurance is needed in education.

In educational discourse, linking quality to education reframes excellence through context-specific priorities. UNESCO (2025) advocates an interdisciplinary, human rights-based approach that satisfies lifelong needs, diversifying content and methods while promoting universal values. This reinforces quality's role, garnering institutional support—though, as the author notes, greater emphasis and mechanisms for quality assurance remain essential to fulfill education's aims.

Quality Assurance Definitions and General Processes

Quality assurance is “an all-embracing term referring to an ongoing, continuous process of evaluating, assessing, guaranteeing, maintaining and improving the quality of an education system, institutions or programs” (Vlasceanu, et al., 2004).

Quality assurance encompasses "an ongoing, continuous process of evaluating, assessing, guaranteeing, maintaining, and improving the quality of an education system, institutions, or programs" (Vlasceanu et al., 2004).

Quality assurance in education is a planned and systematic review process of an institution of or programme to determine whether or not acceptable standards of education, scholarship or infrastructure are being met, maintained or enhanced. Hayward, 2001.

More specifically, it is "a planned and systematic review process of an institution or program to determine whether acceptable standards of education, scholarship, or infrastructure are being met, maintained, or enhanced" (Hayward, 2001).

quality assurance in education monitors quality to boost children's outcomes and tracks progress via essential data across system levels. It sets provider expectations, enables responsive policies with targeted interventions, supports governance through coordinated monitoring, and enhances accountability to stakeholders. This elevates

service value, stimulating family demand for impactful early learning. UNICEF, 2020.

In practice, quality assurance monitors progress via data to boost outcomes, sets provider expectations, enables targeted policies, supports governance, and enhances accountability—elevating service value and family demand for early learning (UNICEF, 2020).

Specific Approaches, Standards, and Tools

There are two types of quality assurance approaches: internal and external. Internal quality assurance is the process whereby an institution assesses itself and/or its programmes based on its mandate and internally-set standards. External quality assurance refers to the process of assessing an institution or program by an external body to determine whether it is meeting the agreed or the predetermined external standards. Quality assurance exists at three levels: the institutional level, the programme and course level. In this case, teacher training institutions, are required to address issues enforced on them by the respective stakeholders (Ministry of Education and Sports, 2019).

Quality assurance in education operates through internal and external mechanisms. Internal quality assurance involves institutions self-assessing against their own mandates and standards, while external assurance entails evaluation by independent bodies against predetermined criteria (Ministry of Education and Sports, 2019). These occur at institutional, program, and course levels, with teacher training institutions addressing stakeholder mandates.

Eswatini, 2019 developed the Standards for Inclusive Education to support pre-primary, primary, and secondary school communities in advancing inclusion. The standards are designed to be used by school leaders and teachers as self-evaluation tools to inform school improvement.

Concisely, tools like Eswatini's (2019) Standards for Inclusive Education serve as self-evaluation frameworks for pre-primary, primary, and secondary schools, guiding leaders and teachers toward school improvement and inclusion.

Standard of education is another issue that has generated unending debates. According to Hanks

[in MOE, 1997:6], “standard is an accepted or approved example of something against which others are judged or measured”. Quality education is related to the achievement of educational standards, and these standards may be classified into the following four broad categories input, content, process and output.

Standards serve as "accepted or approved examples against which others are judged" (Hanks in MOE, 1997:6), encompassing inputs (resources, infrastructure, teachers), processes (teaching, management), and outputs (learning, skills; Adams, 1993).

Quality Assurance in education as adapted from Chopra is a systematic process of organizing education activities to ensure that the education system operates effectively. It includes establishment of clear and well communicated mission and strategic plans of institutions which are comprehensible to all stakeholders in the education sector. It also needs a well planned and dependable action plan on implementing the educational processes and clearly-defined and communicated roles and responsibilities for all participants. At both the ministry and school levels, a common understanding of quality should be created and institutionalized. Furthermore, appropriate monitoring and supervisory framework should be built to ensure that activities are done as planned. Last but not least, there should be suitable corrective and disciplinary actions to rectify shortcomings and strive for continuous improvement in education.

Adapting Chopra (2007), quality assurance organizes educational work to ensure: (1) clear, communicated missions and strategic plans; (2) robust, shared systems like action plans; (3) documented responsibilities; (4) assimilated quality definitions at all levels; (5) monitoring/supervision; and (6) corrective measures.

Analytical Frameworks

Adams (1993) explained that education quality cannot be restricted to outcomes alone but must be examined in terms of inputs (resources, infrastructure, teachers), processes (teaching,

management, school climate), and outputs (student learning, skills, and values).

UNICEF, 2000 has presented a model of quality education as quality learners, quality environment, quality process and quality outcome.

Education for all monitoring report also present the input-process-outcome framework for assessing education quality EFA ,2002. UNESCO’s framework for assessing and improving the quality of education is based on an open-system model that, while acknowledging the Input-Process-Output (IPO) framework, emphasizes the context (learners and environment) in which education occurs. This model, often outlined in the Education for All (EFA) Global Monitoring Reports, focuses on ensuring that inputs, processes, and outputs are aligned to produce equitable and relevant learning outcome. UNESCO, (2002). Global Monitoring Report. education for all: is the world on track.

In the UNESCO’s education quality assurance framework is based on the wider open-system theory that takes into account five major dimensions of quality; namely: learners, context, inputs, process and outcomes/ benefits of education. The belief is that by focusing on each of these factors and the relationship among them, it is possible to clearly understand, monitor, improve and conceivably guarantee quality of education as envisaged by various stakeholders. UNESCO, 2002.

The Input-Process-Output (IPO) model has become a widely adopted analytical framework in educational research, offering a systematic perspective for understanding how various forms of educational input are transformed into observable learning outcomes through structured processes (Sidik, 2022;Chua, 2004;Goi et al., 2024;Galais et al., 2021;Chen et al., 2022. Under the framework of the Input-Process-Output (IPO) model, the educational process is viewed as a systematic structure in which input conditions are transformed into concrete learning outcomes through instructional activities (Chen et al., 2022;Sidik, 2022;

The IPO model dominates educational quality analysis, transforming inputs into outcomes via

processes (Sidik, 2022; Chua, 2004; Goi et al., 2024; Galais et al., 2021; Chen et al., 2022). Variants include UNICEF's (2000) quality learners/environment/process/outcome model and EFA (2002) input-process-outcome framework.

UNESCO (2002) advances an open-system IPO approach, integrating five dimensions—learners, context, inputs, processes, and outcomes/benefits—to monitor, improve, and guarantee quality amid stakeholder expectations (Global Monitoring Report).

Special education and quality in Pakistan

Special education, often denoted by acronyms like SDC or SPED, entails the individualized and systematically monitored arrangement of teaching procedures, adapted equipment, and accessible settings. It is a practice that accommodates the individual differences, disabilities, and special needs of student.

Special education caters to a spectrum of disabilities, including learning disabilities, communication disorders, emotional and behavioral disorders, physical disabilities, developmental disabilities, and more. The diversity of disabilities necessitates a range of additional educational services such as alternative teaching approaches, technology integration, specialized teaching areas, resource rooms, and separate classrooms. The overarching goal is to provide an accommodated education tailored to the unique requirements of each disabled student. (Dhruw et al., 2024)

Special education (SDC/SPED) provides individualized, adapted teaching, equipment, and settings for disabilities like learning, communication, emotional/behavioral, physical, and developmental needs, using alternative methods, technology, and specialized spaces (Dhruw et al., 2024).

Children with disabilities are 10x less likely to attend school. Gaps include teacher training, inaccessible infrastructure (36-61% schools lack ramps/toilets), unreliable prevalence data (2.5-27%), and stigma excluding mild cases. (Bashir & Ahsan, 2023)

No consistent disability prevalence data (2.5-27% estimates). Budgetary allocations inadequate vs. Punjab Free & Compulsory Education Act 2014. Recent policy shift to social model promising but under-resourced; poor SED-SpED coordination persists. (Ali, 2020).

In Pakistan, children with disabilities are 10 times less likely to attend school due to gaps in teacher training, inaccessible infrastructure (36-61% schools lack ramps/toilets), unreliable prevalence data (2.5-27%), stigma, and inadequate budgets versus the Punjab Free & Compulsory Education Act 2014. Policy shifts to a social model show promise but face resource shortages and poor SED-SPED coordination (Bashir & Ahsan, 2023; Ali, 2020).

In Punjab 23% of 8-12-year-olds with moderate-severe disabilities out-of-school (vs. 6% without). Girls face greater exclusion. Parents struggle with transport despite 600+ buses. ~2M special needs students province-wide, overwhelming 35K capacity centers. (Lodi, 2025).

Despite Punjab Government initiatives, major hurdles include institutional negligence, resource shortages, lack of trained teachers, inadequate facilities, and low budget allocations. Abbas & Thakur, (2017)

There are many challenges and hurdles in special education in Punjab are accessibility, Lack of Coordination between Interdisciplinary Team, Insufficient Technological Aids, transition, policy gaps, budgetary issues. When we see in teaching and learning the student-teacher ratio, inappropriate curriculum, insufficient teaching material, lack of teacher pieces of training and conventional evaluation process affect the teaching-learning process badly. Negative social attitudes, parents' negligence about SEN students, lack of coordination in the IEP team and administrative laxity were dominant issues in collaboration. Tahir et al, 2023.

Research in special education is essential to understand the diverse learning needs of students with disabilities. Individuals with disabilities often present unique learning requirements. This Research will play a pivotal role in identifying gaps in provision of infrastructure, comprehending effective instructional strategies, human resources,

and accommodations in curriculum and resources tailored to diverse needs.

In pun jab we will measure the quality of special education in line with (UNESCO, 2002) framework, the quality of education through inputs, processes, and outputs. Quality in education comprises multiple indicators such as input, process, output, and outcome. However, due to the scope and objectives of the present study, the research is delimited to the *input indicator* only, which focuses on foundational conditions of quality in special education institutions.

In the context of special education in Punjab, challenges related to resources, trained personnel, assistive devices, and physical facilities are frequently reported. Therefore, assessing the input indicator was considered essential to identify gaps at the foundational level of quality assurance.

Moreover, focusing on a single indicator allowed for an in-depth and systematic assessment of input quality rather than a superficial coverage of multiple indicators, thereby enhancing the validity and reliability of the findings.

Inputs include curriculum, teacher qualifications, school management, and human resource and infrastructure. Will see the input methods as indicator of measuring quality in special education in pun jab.

Framework for quality input

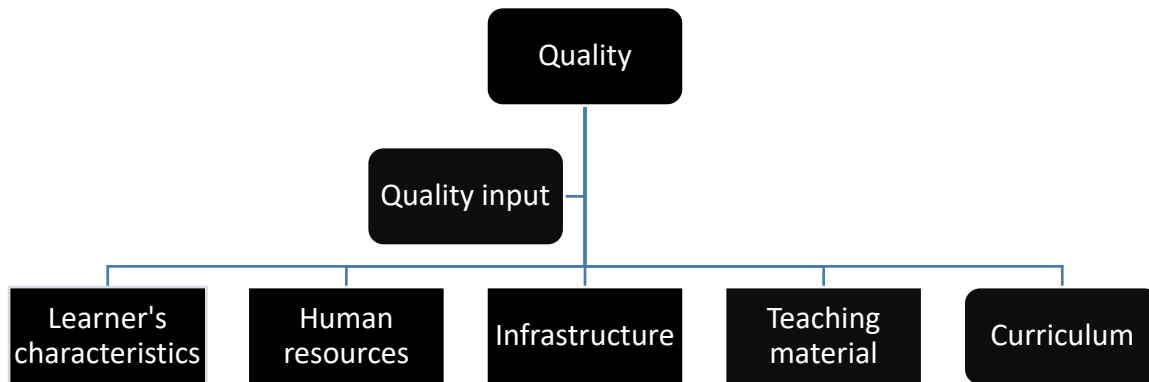
According to the Input-Process-Output model, the quality of educational outcomes is determined by the strength of institutional inputs. In special education institutions of Punjab, well-trained teachers, adequate infrastructure, sufficient learning resources, effective administrative support, and proper student placement collectively form the input system. These inputs enhance teaching-learning processes, which ultimately lead to improved educational outcomes. This causal relationship is widely supported in educational quality assurance frameworks (UNESCO, 2015; World Bank, 2020).

According to our basic input-process-outcome-context framework inputs provide the material

and immaterial pre-conditions for the core transformation processes in organizations. In the case of education, and taking the school as the level where teaching and learning as the primary transformation process take place, the following main categories of inputs can be discerned: - financial and material resources - human resources - background conditions of the students Household and community characteristics as well as guidelines and operational frameworks from administrative levels above the school might also be considered as inputs, when the school is chosen as the level of analysis. EFA,2004.

Inputs are needed resources, human resources and policy framework for effective education systems. UNESCO (2002) states that quality inputs go beyond quantitative aspects, including materials, supplies, etc., and include qualitative aspects such as teacher training and professional competence. These inputs include the presence of qualified, trained and motivated Teachers and competent Administrative Staff. They also include infrastructure, which is defined as learning spaces that are safe, accessible and equipped, including classrooms, sanitation facilities, and libraries. Another important component is curriculum and learning resources such as relevant and inclusive curricula, textbooks, ICT tools and Open Educational Resources (OERs). Lastly, policy inputs include governance structures, funding mechanisms, and laws and regulations that guarantee equitable access and participation in education systems.

High-quality education requires more than physical resources. It depends on effective teaching, supportive school leadership, equity in access, and relevance of learning to local and global contexts (Tikly & Barrett, 2011). Teachers, in particular, play a central role. Darling-Hammond, (2017) stressed that teacher preparation and continuous professional development are critical in transforming curriculum into meaningful learning. Fullan, (2007) highlighted that leadership and collaborative school management create the conditions for sustainable improvements in learning outcomes.



METHODOLOGY

Research Design

The study design used was descriptive survey design which aimed to describe the current situation, opinion and practice in the study area of a large population. It was done within the research paradigm of positivism which states that reality is objective, measurable and independent of the researcher. The quantitative research approach was used to systematically gather quantitative data and identify relationships, differences and patterns among the variables (Creswell, 2018). The data was collected by questionnaire/checklist and SPSS (Statistical Package for Social Sciences) was used for quantitative data entry and analysis. Descriptive statistics including the mean and standard deviation, independent sample t-tests to compare two groups and one-way analysis of variance to compare more than two groups were analyzed. The target population included all the special education teachers of the schools of Punjab.

Sampling Technique

The study employed a multistage stratified random sampling technique, which ensured representation at different administrative levels. At the first stage, the population was stratified according to the nine administrative divisions of Punjab under the Special Education Department.

All nine divisions (n = 9) were included in the study. This strata was made to ensure geographical representation and to minimize regional bias, as educational resources and administrative practices may vary across divisions. Including all divisions enhanced the generalizability of the findings across Punjab. In the second stage, districts and tehsils were treated as sub-strata within each division. From each division, four special education schools were selected, including two district-level schools and two tehsil-level schools, using stratified random sampling. This approach ensured equal representation of both administrative levels, which often differ in terms of infrastructure, staffing, and availability of resources. While in the third stage the sample size for the present study was determined using Cochran's (1977) formula for infinite populations. When the population size is very large or unknown, it is treated as an infinite population, and the sample size is calculated using the following formula:

$$n = \frac{Z^2 p q}{e^2}$$

At 95% confidence level and 5% margin of error, with p = 0.5:

$$n = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2}$$

$$n = \frac{3.8416 \times 0.25}{0.0025}$$

$$n = 384$$

So, the recommended sample size for an infinite population is approximately 384 respondents.

However, in the present study, data were collected using a stratified random sampling technique across divisions, districts, tehsil-level and district-level special education institutions. Due to field constraints and proportional allocation across strata, a total of 360 special education teachers were selected from 36 schools (10 teachers were selected randomly from each school). This sample size was considered adequate and representative, as it closely approximates the recommended sample size and fulfills the requirements of stratified sampling design.

In order to reduce sampling biasness the study used multistage stratified random sampling to obtain proportional representation of all nine divisions of Punjab and district and tehsil level institutions. Stratification was used to better represent the diversity of special education institutions in terms of infrastructure, staffing and available resources on the regional level. The achieved sample size of 360 is close to the statistically suggested sample size of 384 (Cochran's formula), so that t-tests and ANOVA have sufficient statistical power. Proportional allocation was not possible as time and administrative constraints prevented the full sample, but was reliable and valid. Inclusion of all divisions also adds to the external validity and would help in generalization for the special education teachers of all divisions of Punjab.

Data Collection

The presented research is a quantitative in nature that involved structured survey questionnaire administered to special education teachers in government special education institutions in Punjab. Structured questionnaire was used as the main instrument for the study, which included the following variables: Characteristics of the learners, human resources, infrastructure, teaching materials, and the curriculum in special education institutions. Respondents' perceptions were measured using a percentage-based Likert-type scale (100% Strongly Agree/Fully Available and 0% Strongly Disagree/Not Available) which enabled more precise and quantifiable analysis using SPSS. The questionnaire was remodeled from existing educational quality assessment tools, such as the UNESCO input-process-output model as well as other relevant special education assessment tools, and then contextualized with the special education system of Punjab and the objectives of the study.

Reliability

The measurement of quality input questionnaire was validated by 5 experts in the field of special education then To measure the reliability of the instrument, a pilot study was performed. The data for this purpose were gathered from 46 teachers of special education who were engaged in special education institutions of Punjab, Pakistan. Cronbach's alpha was calculated for the questionnaire.

Cronbach's Alpha	Variance	Mean	Std. Deviation	Total
.835	152.798	79.0435	12.36115	46

Validity (content, construct, convergent, discriminant)

The validity of the research instrument was achieved by several methods, namely content validity, construct validity, convergent validity and discriminant validity. The content validation was carried out by experts to ensure that all items

represented the input quality dimensions at the special education institution. The construct validity was tested to ensure that the questionnaire was measuring the theoretical framework of educational inputs intended. The convergent and discriminant validity were ensured by high correlation among the items of the same construct

and the separation among different constructs. All these procedures contributed to the accuracy, relevance and credibility of the measurement tool utilized in this study.

Ethical Considerations

Informed consent was obtained from participants, ensuring confidentiality and voluntary participation. The researcher adhered to ethical guidelines in the treatment of sensitive information, and the privacy of individuals involved will be maintained.

RESULTS

TABLE1: DEMOGRAPHIC INFORMATION OF THE RESPONDENTS

Variables		Frequency	Percentages
Gender	Male	115	31.9%
	Female	245	68.1%
	Total	360	100.0
Qualification	M.A	330	91.7%
	M.PHILL	30	8.3%
	Total	360	100.0
Experience	1-5 years	136	37.8%
	6-10 years	168	46.7%
	11-15 years	47	13.1%
	15-20 years	9	2.5%
	Total	360	100.0
Designation	J.S.E. T	216	60.0%
	S.S.E. T	144	40.0%
	Total	360	100.0
No of Classes	1	48	13.3%
	2	88	24.4%
	3	142	39.4%
	4	36	10.0%
	Multiple	46	12.8%
	Total	360	100.0
Proficiency in teaching	Initial	2	.6%
	Moderate	94	26.1%
	Expert	264	73.3%
	Total	360	100.0

The demographic profile of the respondents provides important insights into the composition of the study sample.

Regarding gender, the majority of respondents were female (68.1%), while 31.9% were male. This indicates a higher representation of female participants in the study.

In terms of academic qualification, most respondents held a Master's degree (M.A.) (91.7%), whereas only 8.3% possessed an M.Phil. degree. This suggests that the sample largely comprised individuals with postgraduate-level

qualifications, with relatively fewer having advanced research degrees.

With respect to teaching experience, the largest proportion of respondents (46.7%) had 6–10 years of experience, followed by 37.8% with 1–5 years. A smaller proportion had 11–15 years (13.1%), and only 2.5% had 15–20 years of experience. This indicates that the majority of participants were in their early to mid-career stages.

In terms of designation, 60.0% of respondents were Junior School Educators (J.S.E.T), while 40.0% were Senior School Educators (S.S.E.T).

This shows a higher representation of junior-level teaching staff in the sample.

Regarding the number of classes taught, the largest group of respondents (39.4%) reported teaching three classes, followed by 24.4% teaching two classes. Additionally, 13.3% taught one class, 10.0% taught four classes, and 12.8% reported teaching multiple classes. This suggests variability in workload distribution among teachers.

Finally, in terms of proficiency in teaching, a significant majority (73.3%) rated themselves as expert, followed by 26.1% as moderate, while only a negligible proportion (0.6%) considered themselves at the initial level. This reflects a generally high level of self-perceived teaching competence among respondents.

TABLE 2: DESCRIPTIVE STATISTICS FOR LEARNERS' CHARACTERISTICS

Statements	100%	75%	50%	25%	0%	Mean	Std.
attends a preschool or early childhood education program	41 11.4%	109 30.3%	143 39.7%	47 13.1%	20 5.6%	2.71	1.0151
The school provides language-appropriate education	45 12.5%	144 40.0%	100 27.8%	59 16.4%	12 3.3%	2.58	1.011
Development of critical and analytical thinking skills through the curriculum.	106 36.7%	132 29.4%	79 21.9%	27 7.5%	16 4.4%	2.20	1.083
education system effectively promotes problem-solving capacities	29 8.1%	109 30.3%	114 31.7%	72 20.0%	36 10.0%	2.93	1.106
Communication skills are actively developed and assessed in students	37 10.3%	114 31.7%	152 42.2%	43 11.9%	14 3.9%	2.67	.9485

The descriptive analysis of statements related to teaching-learning outcomes and skill development provides insights into the effectiveness of educational practices.

The findings indicate a mixed effectiveness of educational practices. Attendance in preschool or early childhood programs shows a moderate level of agreement (M = 2.71, SD = 1.01), suggesting it is present but not consistently emphasized. Language-appropriate education is perceived as moderately low (M = 2.58, SD = 1.01), indicating gaps in its implementation. The development of

critical and analytical thinking skills reflects a low level of agreement (M = 2.20, SD = 1.08), highlighting limited focus on higher-order thinking. Similarly, problem-solving capacities are moderately addressed (M = 2.93, SD = 1.11) but lack consistency. Communication skills development shows a moderate perception (M = 2.67, SD = 0.95), indicating some effort but still room for improvement. Overall, the results suggest the need for strengthening key areas of teaching and learning to enhance student outcomes.

TABLE.3: DESCRIPTIVE STATISTICS FOR HUMAN RESOURCES

Statements	100%	75%	50%	25%	0%	Mean	Std.
staff possess adequate qualifications and expertise	44	152	93	64	7	2.5500	.98329
	12.2%	42.5%	25.5%	17.8%	1.9%		
Teachers are considered experts in educational methodologies	116	137	72	21	14	2.1111	1.82485
	32.2	38.1	20.0	5.8	3.9		
Classroom management by teachers is generally	132	108	78	36	6	2.2500	1.82485
	36.7	20.0	21.7	10.0	1.7		
Engagement of students in class	83	142	100	28	7	2.2611	.96377
	23.1	39.4	27.8	7.8	1.9		
goals are set for students	130	150	66	7	7	1.9194	.89047
	36.1	41.7	18.3	1.9	1.9		

The analysis of staff-related practices indicates generally moderate to low perceptions among respondents. The statement that staff possess adequate qualifications and expertise shows a moderate level of agreement ($M = 2.55$, $SD = 0.98$), suggesting that while qualifications are present, they may not fully meet expectations. However, teachers being considered experts in educational methodologies reflects a low level of agreement ($M = 2.11$, $SD \approx 1.82$), indicating concerns regarding pedagogical expertise.

Similarly, classroom management ($M = 2.25$, $SD \approx 1.82$) and student engagement ($M = 2.26$, $SD \approx 0.96$) are perceived at lower levels, highlighting challenges in effective teaching practices. Furthermore, the setting of goals for students shows the lowest mean score ($M = 1.91$, $SD \approx 0.89$), indicating a significant gap in structured academic planning. Overall, the findings suggest a need to strengthen teacher competencies, classroom practices, and goal-oriented instruction to improve educational quality.

TABLE.4: DESCRIPTIVE STATISTICS FOR INFRASTRUCTURE AND FACILITIES

Statements	100%	75%	50%	25%	0%	Mean	Std.
Norms for providing adequate teaching materials.	49	133	134	37	7	2.5000	.92022
	13.6	36.9	37.2	10.3	1.9		
The requirements for safety techniques	28	133	234	52	13	2.6917	.93638
	7.8	36.9	37.2	14.4	3.6		
Plan for emergency preparedness.	61	117	125	42	15	2.5361	1.03629
	16.9	32.5	34.7	11.7	4.2		
Adequate and suitably adjusted building	38	125	132	38	27	2.6972	1.04228
	10.6	34.7	36.7	10.6	7.5		

Accessible and safe sanitary conditions	38	131	116	60	15	2.6750	1.00829
	10.6	36.4	32.2	16.7	4.2		
Infrastructure and equipment adhere to the standards	46	105	140	30	39	2.7528	1.12331
	12.8	29.2	38.9	8.3	10.8		
Management body role in providing adequate equipment and facilities as per institutional standards	34	135	117	62	12	2.6750	.97743
	9.4	37.5	32.5	17.2	3.3		

The analysis of institutional resources and infrastructure indicates moderate levels of agreement across most indicators. The provision of adequate teaching materials ($M = 2.50$, $SD = 0.92$) reflects a moderate perception, suggesting partial availability. Similarly, safety requirements ($M = 2.69$, $SD \approx 0.94$) and emergency preparedness planning ($M = 2.54$, $SD \approx 1.04$) indicate that safety measures exist but may not be consistently implemented. The adequacy of buildings ($M = 2.70$, $SD \approx 1.04$) and sanitary conditions ($M = 2.68$, $SD = 1.01$) are also rated

moderately, pointing to acceptable but improvable conditions. Infrastructure and equipment meeting standards ($M = 2.75$, $SD \approx 1.12$) show slightly better perceptions, while the role of management in providing facilities ($M = 2.68$, $SD \approx 0.98$) remains moderate. Overall, the findings suggest that although basic infrastructure and resources are in place, there is a need for consistent improvement, better planning, and stronger management involvement to fully meet institutional standards.

TABLE.5: DESCRIPTIVE STATISTICS FOR TEACHING AND LEARNING MATERIALS

Statements	100%	75%	50%	25%	0%	Mean	Std.
Accessible and adapted teaching and learning material	49	101	127	64	19	2.7306	1.06980
	13.6	28.1	35.3	17.8	5.3		
Adapted current state and national learning standards	51	142	125	41	1	2.4417	.88121
	14.2	39.4	34.7	11.4	.3		
Teachers receive adequate and timely teaching and learning material	28	156	131	43	2	2.5417	.82336
	7.8	43.3	36.4	11.9	.6		
Availability of technology and assistive learning materials	46	141	123	48	2	2.4972	.89877
	12.8	39.2	34.2	13.3	.6		
Culturally responsive and linguistically appropriate content	37	137	123	53	10	2.6167	.95161
	10.3	38.1	34.2	14.7	2.8		

Assistive technology is provided	49	125	140	38	8	2.5306	.93174
	13.6	34.7	38.9	10.6	2.2		
Assistive tools assessed and selected on students' individual needs	24	128	142	48	18	2.7444	.94484
	6.7	35.6	39.4	13.3	5.0		
Training to teachers for effective use of assistive technologies	56	116	128	46	14	2.5722	1.02357
	15.6	32.2	35.6	12.8	3.9		
Use of technologies as augmented reality, AI based tools	38	125	133	37	27	2.6944	1.04013
	10.6	34.7	36.9	10.3	7.5		

The descriptive analysis of teaching and learning materials indicates generally moderate perceptions across all indicators. Accessibility and adaptation of materials ($M = 2.73$, $SD \approx 1.07$) and alignment with national learning standards ($M = 2.44$, $SD \approx 0.88$) suggest that materials are available but not fully optimized. The provision of timely materials to teachers ($M = 2.54$, $SD \approx 0.82$) and availability of technology ($M = 2.50$, $SD \approx 0.90$) reflect moderate adequacy, though inconsistencies exist. Similarly, culturally responsive content ($M = 2.62$, $SD \approx 0.95$) and assistive technology provision (M

$= 2.53$, $SD \approx 0.93$) indicate partial implementation. Slightly higher mean scores for needs-based selection of assistive tools ($M = 2.74$, $SD \approx 0.94$) and use of advanced technologies such as AI and augmented reality ($M = 2.69$, $SD \approx 1.04$) suggest emerging practices. Training for teachers ($M = 2.57$, $SD \approx 1.02$) also remains moderate. Overall, the findings imply that while teaching and learning materials and technologies are present, there is a need for better alignment, accessibility, and teacher support to ensure effective utilization.

TABLE.6: DESCRIPTIVE STATISTICS FOR CURRICULUM

Statements	100%	75%	50%	25%	0%	Mean	Std.
Curriculum is systematically adapted	43	138	109	57	13	2.6083	1.00663
	11.9	38.3	30.3	15.8	3.6		
Availability of textbooks and learning materials	47	103	143	28	39	2.7472	1.12207
	13.1	28.6	39.7	7.8	10.8		
Development of Individualized Education Programs (IEP) are developed	39	128	116	63	14	2.6806	1.01007
	10.8	35.6	32.2	17.5	3.9		
IEP goals involve comprehensive consultation with qualified professionals	56	128	121	42	13	2.5222	1.00669
	15.6	35.6	33.6	11.7	3.6		

Formal training and professional development to design and implement IEP	68	81	119	84	8	2.6750	1.09567
	18.9	22.5	33.1	23.3	2.2		
System of ongoing monitoring and evaluation of IEP	137	57	106	52	8	2.2694	1.17644
	38.1	15.8	29.4	14.4	2.2		

The descriptive analysis of the curriculum indicates moderate levels of effectiveness across most indicators. The systematic adaptation of the curriculum (M = 2.61, SD ≈ 1.01) suggests partial alignment with learners' needs. The availability of textbooks and learning materials (M = 2.75, SD ≈ 1.12) reflects relatively better provision, though still not fully satisfactory. The development of Individualized Education Programs (IEPs) (M = 2.68, SD ≈ 1.01) and consultation with professionals in setting IEP goals (M = 2.52, SD ≈ 1.01) indicate moderate implementation.

Similarly, training for teachers to design and implement IEPs (M = 2.68, SD ≈ 1.10) shows room for improvement. However, the lowest mean score is observed for the system of ongoing monitoring and evaluation of IEPs (M = 2.27, SD ≈ 1.18), highlighting a key weakness. Overall, the findings suggest that while curriculum practices and IEP-related processes are present, there is a need for stronger monitoring systems, enhanced professional training, and more effective implementation to improve curriculum outcomes.

TABLE.7: INDEPENDENT SAMPLE T-TEST FOR GENDER DIFFERENCE

Factors	F	Sig.	T	df	Sig.(2-tailed)	Mean difference
Learners' characteristics	2.038	.154	-1.496	358	.136	-.52103
Human resources	2.923	.088	-.858	358	.391	-.27524
Infrastructure and facilities	1.580	.210	-.262	358	.793	-.13026
Teaching and Learning Materials	1.734	.189	-.326	358	.744	-.17232
Curriculum	.165	.685	-.622	358	.534	-.25324

The independent samples t-test was conducted to examine gender differences across key factors. Levene's test indicated that the assumption of equal variances was met for all variables ($p > .05$). The results revealed no statistically significant gender differences in any of the factors, including learners' characteristics ($t = -1.496$, $p = .136$), human resources ($t = -0.858$, $p = .391$),

infrastructure and facilities ($t = -0.262$, $p = .793$), teaching and learning materials ($t = -0.326$, $p = .744$), and curriculum ($t = -0.622$, $p = .534$). Overall, the findings suggest that male and female respondents share similar perceptions across all examined domains, indicating no gender-based variation in views regarding educational practices and resources.

TABLE.8: INDEPENDENT SAMPLE T-TEST FOR DESIGNATION DIFFERENCE

Factors	F	Sig.	T	df	Sig.(2-tailed)	Mean difference
Learners' characteristics	.096	.757	1.291	358	.198	.42824
Human resources	4.269	.040	1.321	347.970	.187	.38426
Infrastructure and facilities	1.368	.243	-2.143	358	.033	-1.00694
Teaching and Learning Materials	6.471	.011	-.897	334.947	.370	-.43750
Curriculum	5.965	.015	-1.016	344.338	.310	-.37731

the independent samples t-test was conducted to examine differences based on designation. Levene's test indicated mixed results; therefore, appropriate rows were considered accordingly. The findings revealed that there was no significant difference in learners' characteristics ($p = .198$), human resources ($p = .187$), teaching and learning materials ($p = .370$), and curriculum ($p = .310$).

However, a statistically significant difference was found in infrastructure and facilities ($t = -2.143$, $p = .033$), indicating that perceptions differ by designation in this domain.

Overall, the results suggest that designation does not influence perceptions across most factors, except for infrastructure and facilities, where a notable difference exists.

TABLE.9: ONE-WAY ANOVA RESULTS ON EXPERIENCE OF THE TEACHERS

Factors		Sum of Squares	df	Mean Square	F	Sig.
Learners' characteristics	Between Groups	.259	1	.259	.027	.869
	Within Groups	3421.297	358	9.557		
	Total	3421.556	359			
Human resources	Between Groups	29.020	1	29.020	3.634	.057
	Within Groups	2858.955	358	7.986		
	Total	2887.975	359			
Infrastructure and facilities	Between Groups	1.383	1	1.383	.072	.789
	Within Groups	6918.339	358	19.325		
	Total	6919.722	359			
Teaching and Learning Materials	Between Groups	549.400	1	549.400	27.090	.000
	Within Groups	7260.464	358	20.281		
	Total	7809.864	359			
Curriculum	Between Groups	44.758	1	44.758	3.485	.063
	Within Groups					

Within Groups	4597.239	358	12.841
Total	4641.997	359	

The one-way ANOVA was conducted to examine differences based on teachers' experience. The results indicated that there were **no statistically significant differences** in learners' characteristics ($F = 0.027, p = .869$), infrastructure and facilities ($F = 0.072, p = .789$), and curriculum ($F = 3.485, p = .063$), as their p-values were greater than .05. However, a **significant difference** was found in **human resources** ($F = 3.634, p = .057$), which is marginal and close to the significance threshold, suggesting a potential variation across experience

levels. A **highly significant difference** was observed in **teaching and learning materials** ($F = 27.090, p = .000$), indicating that teachers' experience significantly influences perceptions in this area.

Overall, the findings suggest that teachers' experience does not affect most factors, except for **teaching and learning materials**, where a strong difference exists, and **human resources**, where a marginal effect is observed.

TABLE.10:ONE-WAY ANOVA RESULTS ON QUALIFICATION OF THE TEACHERS

Factors		Sum of Squares	df	Mean Square	F	Sig.
Learners' characteristics	Between Groups	.259	1	.259	.027	.869
	Within Groups	3421.297	358	9.557		
	Total	3421.556	359			
Human resources	Between Groups	29.020	1	29.020	3.634	.057
	Within Groups	2858.955	358	7.986		
	Total	2887.975	359			
Infrastructure and facilities	Between Groups	1.383	1	1.383	.072	.789
	Within Groups	6918.339	358	19.325		
	Total	6919.722	359			
Teaching and Learning Materials	Between Groups	549.400	1	549.400	27.090	.000
	Within Groups	7260.464	358	20.281		
	Total	7809.864	359			
Curriculum	Between Groups	44.758	1	44.758	3.485	.063
	Within Groups	4597.239	358	12.841		
	Total	4641.997	359			

The one-way ANOVA was conducted to examine differences based on teachers' qualifications. The results revealed that there were no statistically

significant differences in learners' characteristics ($F = 0.027, p = .869$), infrastructure and facilities ($F = 0.072, p = .789$), and curriculum ($F = 3.485,$

$p = .063$), as all p -values were above $.05$. However, a statistically significant difference was found in teaching and learning materials ($F = 27.090$, $p = .000$), indicating that teachers' qualifications significantly influence perceptions in this area. A marginal difference was also observed in human

resources ($F = 3.634$, $p = .057$), which is close to the significance level.

Overall, the findings suggest that teachers' qualifications do not significantly affect most factors, except for teaching and learning materials, where a strong significant difference exists.

TABLE.11:ONE-WAY ANOVA RESULTS ON NO OF CLASSES OF THE TEACHERS

Factors		Sum of Squares	df	Mean Square	F	Sig.
Learners' characteristics	Between Groups	115.905	4	28.976	3.112	.015
	Within Groups	3305.650	355	9.312		
	Total	3421.556	359			
Human resources	Between Groups	112.442	4	28.111	3.595	.007
	Within Groups	2775.533	355	7.818		
	Total	2887.975	359			
Infrastructure and facilities	Between Groups	661.366	4	165.341	9.379	.000
	Within Groups	6258.356	355	17.629		
	Total	6919.722	359			
Teaching and Learning Materials	Between Groups	757.185	4	189.296	9.528	.000
	Within Groups	7052.678	355	19.867		
	Total	7809.864	359			
Curriculum	Between Groups	160.991	4	40.248	3.189	.014
	Within Groups	4481.006	355	12.623		
	Total	4641.997	359			

The one-way ANOVA was conducted to examine differences based on the number of classes taught by teachers. The results revealed statistically significant differences across all factors, including learners' characteristics ($F = 3.112$, $p = .015$), human resources ($F = 3.595$, $p = .007$), infrastructure and facilities ($F = 9.379$, $p = .000$), teaching and learning materials ($F = 9.528$, $p = .000$), and curriculum ($F = 3.189$, $p = .014$).

These findings indicate that the number of classes taught significantly influences teachers' perceptions in all measured domains. Overall,

teachers handling different class loads show varying levels of perception regarding educational resources, institutional support, and curriculum implementation, suggesting that workload is a key factor affecting educational experiences.

DISCUSSION

The present study examined quality assurance practices in special education institutions in Punjab across multiple domains, including leadership, curriculum, teaching and learning, resources, and institutional support. The findings

reveal that most dimensions are perceived as moderate to below satisfactory, indicating that quality assurance mechanisms are present but not yet fully effective or consistently implemented.

Overall, respondents reported moderate perceptions of institutional practices such as leadership communication, curriculum implementation, teaching and learning materials, and student support systems. These findings suggest that while foundational structures exist, there are significant gaps in the consistency, depth, and effectiveness of quality assurance practices in special education settings.

These results are consistent with the view that quality assurance in education is a continuous improvement process rather than a fixed outcome, requiring strong institutional capacity, monitoring, and feedback systems (Stensaker, 2008; Harvey & Green, 1993).

The study found that workload (number of classes taught) significantly affects teachers' perceptions across all domains, while demographic factors such as gender, qualification, and experience show minimal influence. This suggests that quality assurance issues are primarily structural rather than individual, highlighting systemic constraints in the education system.

High teaching workload has been widely recognized as a barrier to effective instructional delivery and quality improvement. Overburdened teachers often struggle to implement individualized instruction, assessment practices, and curriculum adaptation effectively (OECD, 2019). This is particularly critical in special education, where learners require differentiated and individualized support.

Findings indicate that curriculum implementation, teaching materials, and assessment systems are perceived as moderately effective but inconsistent, with weaknesses in monitoring and individualized education planning. This aligns with research suggesting that curriculum adaptation in special education often remains theoretical rather than practical, especially in developing education systems (UNESCO, 2020).

The limited use of assessment feedback and innovative teaching strategies further reflects

challenges in implementing evidence-based instructional practices, which are essential for improving learner outcomes in special education settings (Black & Wiliam, 1998).

The study also found that institutional leadership plays a moderate role in communication and motivation but lacks strong effectiveness in ensuring consistent quality assurance practices. Effective school leadership is widely recognized as a key driver of educational quality, particularly in inclusive and special education systems (Leithwood et al., 2008).

The findings suggest a need for stronger leadership engagement in monitoring, teacher support, and resource allocation, which are critical components of sustainable quality assurance systems.

Overall, the findings indicate that quality assurance in special education institutions in Punjab is partially implemented but not fully institutionalized. Weak monitoring systems, inconsistent curriculum adaptation, limited use of assessment data, and inadequate resources hinder effective quality assurance.

Quality assurance frameworks in education emphasize continuous evaluation, accountability, and improvement cycles, yet these appear to be inconsistently applied in the context of the present study (ENQA, 2015). The results suggest that special education institutions require stronger internal quality assurance mechanisms aligned with international best practices.

CONCLUSION

Overall, the descriptive statistics indicate that respondents generally perceive most dimensions of educational practices—including leadership, teaching and learning, curriculum, resources, and institutional support—as moderate to below satisfactory, with several areas showing variability in responses. The independent sample t-test results reveal that gender does not significantly influence perceptions across all major factors, while designation shows a significant difference only in infrastructure and facilities, indicating limited variation based on professional role. The one-way ANOVA findings further show that experience and qualification have minimal impact, with significant differences appearing

mainly in teaching and learning materials and a marginal effect in human resources. However, the number of classes taught emerges as the most influential factor, showing significant differences across all domains, suggesting that workload strongly shapes teachers' perceptions. Overall, the study concludes that institutional effectiveness is more affected by workload and instructional conditions than by demographic characteristics, highlighting the need to improve resource distribution, teaching support, and workload management to enhance educational quality.

Based on results, the findings indicate that quality assurance in special education in Punjab is present but not yet fully effective or consistently implemented across institutions. The descriptive statistics show that most key domains—such as leadership, curriculum, teaching and learning, resources, and institutional support—are perceived as moderate to below satisfactory, which suggests gaps in ensuring strong and uniform quality standards.

The inferential results further show that demographic factors (gender, qualification, experience, and designation) have limited influence on perceptions of quality, meaning that weaknesses in quality assurance are systemic rather than individual-based. However, the significant impact of number of classes taught across all domains highlights that workload is a critical barrier, affecting how teachers experience and implement quality assurance practices.

Overall, this suggests that quality assurance mechanisms in special education in Punjab are not being shaped by teacher characteristics, but by structural and institutional conditions, particularly workload, resource availability, and instructional support. Therefore, strengthening quality assurance requires system-level improvements, including better resource provision, reduced workload, improved monitoring systems, and more consistent implementation of policies to ensure equitable and effective special education services.

Theoretical Implications

The results of this study further support the input–process–output model of educational effectiveness by highlighting the importance of inputs in special education with regards to infrastructure, human resources, curriculum, and leadership. It also reinforces theories of constructivist and inclusive education, emphasizing the need for learner-centered approaches, differentiated instruction and individual education plans (IEPs) to meet the diverse learning needs. The findings also expand evidence-based practice theory by providing evidence for the need to use data for making decisions to enhance teaching and institutional outcomes. Furthermore, it is important to note that the study helps in leadership theories in education by emphasizing the importance of instructional leadership in enhancing teacher performance and improving the institution.

Practical Implications

In practice, schools need to ensure that their internal quality assurance systems are further enhanced by regular monitoring, evaluation and feedback arrangements, including systematic and routine inspections of teaching and student outcomes. The rationalization of the teacher workload should be achieved through the recruitment of enough teachers, providing increased time for lesson planning, evaluation and personalized instruction. The capacity of the school leaders need to be developed and strengthened in focus areas such as instructional supervision, communication, and collaborative decision making. Improved implementation of the curriculum should involve adapting learning materials to accommodate a variety of learners using effective strategies to implement Individualized Education Plans (IEPs). Teachers need to be trained in inclusive teaching strategies, assistive technologies and modern assessments through continuous professional development programs. Institutions should also provide enhanced access to resources for teaching and learning, such as digital tools and assistive tools, and safe, accessible and equipped infrastructure. Consider involving parents and caregivers in the

process and increase their accountability and support of students. Last, but not least, the learning approaches that classrooms use should be inclusive and student centered, while fostering academic and socio-emotional learning.

Limitations and Future Directions

The results of this study may not be generalizable to other regions or to private special education schools because of the limitation of the study area to the government special education schools in Punjab. The data are self-reported perceptions of the teachers and can have response bias. Furthermore, the cross-sectional research design only allows for observations at one time, and cannot account for change over time. The study also focuses on a limited range of input dimensions and does not explore the scope of other policy-level or administrative constraints in-depth.

Further research should expand to other special education institutions (public and private) in other provinces and widen the scope for better generalizability. Longitudinal research designs are suggested for studying the change of quality assurance practices over time. Additional research can also use mixed methods to gain further and more contextualized insights, e.g. using interviews and classroom observations. In addition, more studies should explore the influence of policy implementation, effectiveness of leadership, and student learning outcomes on the relationship of QA in special education environments.

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