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Author (s):	Arqam Tariq[1], Muhammad Waseem Iqbal[2], Hinna Hafeez[2], Zaib Unnisa[2]
Affiliation (s):	[1]Finance Department, Government of the Punjab, Pakistan [2]Superior University, Lahore, Pakistan
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Interactive Learning Interfaces to Enhance Student Engagement and Performance in the Government Education Sector of Higher Schools of Punjab

Arqam Tariq[1*], Muhammad Waseem Iqbal[2], Hinna Hafeez[2], and Zaib Unnisa[2]

[1] Finance department, Government of the Punjab, Pakistan
[2]Superior University, Lahore, Pakistan

Abstract

Punjab is Pakistan's largest province and according to the School Census of Punjab, there are around 12.86 million students enrolled in public schools, and there are 391,799 teachers working in 52,470 public schools, resulting in a 33:1 student-teacher ratio. Pakistan as a whole and Punjab province both have literacy rates of above 70%, yet this is not a real reflection of Pakistan's educational system. Punjab's current educational policy has major flaws, including high student-teacher ratio, uneven distribution of teachers with scarcity in rural regions, deteriorating educational outcomes, a declining proportion of children who attend government schools, declining proportion of public-school graduates working in white-collar jobs, increasing number of out-of-school children ("Punjab Province", 2018), and many others. Pakistan needs to enhance its public education system not only to tackle economic, social, and developmental challenges but also to meet international commitments like the Sustainable Development Goals (SDGs). The digital revolution, driven by technological advancements, has transformed various industries, including education. This shift allows the adoption of Learning Management Systems (LMS) in higher education institutions within Punjab's government education system. By replacing traditional textbooks with digital content and utilizing interactive learning interfaces, policymakers and educators can create a more effective and engaging learning environment. The study's implications extend beyond Punjab, serving as a valuable guide for similar programs globally aiming to enhance student performance and engagement in government schools.

***Keywords*:** Punjab (Province of Pakistan), Ratio (mathematical relationship btw variables), SDGs (Sustainable Development Goals), white collar jobs (respectable jobs), curriculum (syllabus).

[*] Corresponding Author: arqamtariq@gmail.com,

Introduction

One of the primary goals of education is to enhance students' learning. The future of both individuals and communities is shaped through education, which is the cornerstone of any society's development. Government schools are essential in ensuring that a large section of the population, especially in developing nations, has access to education. But in recent years, people have become increasingly worried about the declining educational quality in public institutions. This reduction has been attributed to elements like outmoded teaching strategies, lack of funding, and most notably outdated performance of public schools due to teachers' unions, outdated curriculum and hiring & promotion structure of teachers. The enrollment patterns have also changed noticeably, with more parents choosing private schools or other alternative educational options. This pattern emphasizes, even more, how critical it is to address the difficulties government schools face and reform their educational programs.

Researchers and educators have focused on creating and assessing interactive learning interfaces to address these problems and raise educational standards. These user interfaces make use of technology to raise student performance and engagement, providing a promising response to the problems now plaguing the public education system. Interactivity and engagement with educational content are made possible via interactive learning interfaces, which are technology tools and platforms. These interfaces can be presented in a variety of ways, such as gamified learning environments, virtual reality experiences, online platforms, mobile applications, and online platforms. These interfaces strive to give students a more immersive and dynamic educational experience by including interactive components in the learning process.

These user interfaces can be created to address the unique requirements and difficulties experienced by government schools. They can provide both students and teachers with personalized learning routes, adaptive exams, multimedia content, and real-time feedback. Additionally, by giving users access to digital learning resources that might not otherwise be available in conventional classroom settings, these interfaces might close the resource gap and help address the educational challenges. It is crucial to thoroughly assess how interactive learning interfaces can improve student engagement and performance. To determine how these interfaces affect various educational outcomes, including academic achievement, retention rates, and

teachers' performance, researchers and educators have been conducting studies.

However, it is essential to guarantee that these user interfaces are created with an emphasis on diversity, equity, and accessibility. To properly implement and scale these efforts, collaboration between academics, educators, policymakers, and other stakeholders is required. By working together, educational standards can be raised, give students more agency, and give the government education system a better future. Technology integration in education has transformed conventional teaching methods in the digital age. The computer-based education system, which combines computers and interactive software to improve the learning experience in schools, is one important breakthrough. The revolutionary potential of using computer-based teaching systems in schools is highlighted as this essay examines the advantages and difficulties of doing so.

Government schools' deteriorating educational standards and their declining enrollment trends demand quick attention and creative solutions. A promising strategy to raise student performance and engagement in the public education system is to overhaul the human resource system currently prevalent in the public school system. It includes hiring of teachers, their promotion processes and overall policies that govern their terms & conditions of service.

Literature Review

The study's foundation is Walberg's (1981) educational productivity theory, which links interpersonal abilities to academic success. According to this hypothesis, extra student factors, including cognitive, behavioral, and attitudinal ones, have an impact on their academic performance (Abid et al., 2021). Walberg's theory (1981) further acknowledged nine. The factors affecting pupils' educational success include their prior academic success, motivation, developmental stage, amount and quality of instruction, home environment, classroom atmosphere, interpersonal skills and peer relationships, and media exposure. The first three factors are elements of student aptitude. The remaining four variables all indicate different facets of environmental elements. The fourth and fifth variables reveal teaching components.

The study's independent variable, interpersonal skills, measures students' interpersonal compatibility using a rating scale, whereas

curriculum-based accomplishment ratings are regarded as academic achievement (dependent variable). Moreover, Abid, Ali, and Akhter concluded that "proximal" factors, such as psychological, instructional, and environmental factors, have a greater impact on accomplishment than "distal" factors, such as demography and state/district, do (Abid et al., 2021). Through a longitudinal study, Lim and Kim (2011) investigated the causal connection between students' social actions and their reading abilities. They discovered a considerable difference between the interpersonal abilities of male and female pupils, with females scoring higher than males. Also, they concluded that pupils' reading performance is significantly influenced by interpersonal skills.

The extent of the connections between interpersonal abilities and reading proficiency, however, was noteworthy. Meanwhile, reading proficiency and academic performance are significantly correlated with children's social skills (Cooper et al., 2014). Moreover, Wentzel (2012) discovered that students who participate in positive interactions do better academically. However, Tsai and Liu (2015) investigated the relationships between students' interpersonal and time management abilities and academic accomplishment. It has also been observed that the performance of students who use LMS increases as compared to those who do not use it. Results have also shown that the kind of device and operating system used has an impact on the percentage of topics that students pass (Fernández-Soriano et al., 2019). Thus, it is very important that students are provided opportunities to use LMS so that their learning outcomes are improved through the use of technology. Although it is evolving in Pakistan to a better extent in private schools and to some extent in public schools, it is very common in the developed world.

Problem Definition

The public education system in Pakistan has suffered, which has led to a rise in the proportion of kids attending private schools rather than public ones and a reduction in the performance of government schools relative to prior years. The primary causes of this are teacher politics and the outmoded curriculum & and teaching methods used in public schools.

The government must respond to this issue right away by taking appropriate structural and policy measures. Although the past administrations attempted to address some of the difficulties, their efforts

fell short of success. Previous initiatives, including extensive teacher monitoring through third parties, budget allocation without setting up clear-cut targets, strengthening teachers' unions, etc., failed because issues were not properly identified by the policymakers, leading to incorrect policy alternatives and ultimately ineffective solutions. Pakistan has one of the lowest education budgets in Asia (Ghazi et al., 2010), but focusing only on financial allocation and disregarding other issues will not fix the issues. The primary problems influencing Punjab's school performance and educational standards include the politicization of the Education Department, the existence of overly powerful teachers' unions, the lack of teacher promotions based on the achievement of their students in exams, outmoded teaching methods and curricula, etc. Researchers have also highlighted additional crucial policy difficulties (Ghazi et al., 2010; Islamabad Policy Research Institute, 2015), however, if the fundamental issues are given top priority by the current administration, it will greatly aid in strengthening the educational system.

Teachers are hired as permanent government employees, so it is exceedingly difficult to remove those who are performing below expectations because of the procedural obstacles. Furthermore, a school's headmaster or principal lacks the power to discipline underperforming instructors. The school head's authority towards the teachers is compromised because he or she can only recommend action; actual action must be taken by the Chief Executive Officer of the District Education Authority or the Secretary of the School Education Department, both of whom are based at the Provincial headquarters. There is no motivation for teachers to put in extra effort because their promotions are based on predefined time brackets and have nothing to do with how well their students score on various exams.

The centralized hiring process has also strengthened the unions and associations representing teachers. Teachers are unionized at the provincial level, where they are hired, making it very simple for them to band together and put up resistance whenever their vested interests are harmed. Therefore, the union organizes whenever any of its members are subjected to disciplinary action, whenever the instructors are transferred to other schools in the province, or whenever any changes to the curriculum, the recruiting procedure, or the compensation are suggested. The union never agrees to new policy measures being implemented by the government in the public

schools. Province-wide strikes result from it, and eventually, the administration gives in to their pressure.

The third issue is that the public schools continue to use obsolete curricula and antiquated teaching methods, as well as outdated syllabi. As a result, most students who graduate from public schools go on to work in low-skilled administrative positions. They cannot compete with those who graduate from contemporary English-medium schools. In Pakistan, most candidates who passed the civil service examination a few years ago were graduates of public universities, but this pattern has now altered. When comparing the education of successful candidates at the school level, it was found that Lahore University of Management Sciences had the greatest percentage of successful students in the 2016 civil service exam ("LUMS Achieves Highest Pass", 2016).

Lack of IT engagement in the primary school system is another crucial problem that must be addressed; on a global scale, it has been observed that as technology has advanced in the educational system, better outcomes have been produced. Technology will give people the chance to study quickly while also delivering a modern curriculum as opposed to rote learning of out-of-date material. Medical research has shown that interactive images and screens with vibrant colors help kids learn more quickly than textbooks used in Pakistan and Punjab. To strengthen the province's public education system, the issues stated above must be resolved right away (Aziz et al., 2014). As the world works to fulfill the SDGs, many of these and other crucial concerns need to be addressed. Many of them were also mentioned in UNICEF's 2018 report (UNICEF, 2018).

Methodology

Objectives

The major objective of this research is to identify the factors which can improve Punjab's public school system. The core issues addressed in this paper revolve around improving the hiring process of teachers in public sector schools and comparing existing curricula with international standards for its improvements of existing curricula. The methodology used in this paper is mostly based on budgetary analysis, observational data based on educational results of previous academic years, surveys, questionnaires and interviews from students & parents.

Hypothesis

The following are the hypotheses which will be addressed by the analysis of available data:

H0: good number of teachers hiring shows good academic results for students.

H1: By increasing the salaries of faculty, the quality of education also improves.

H2: Good Students Teacher Ratio improves the results.

Paper Structure

A multipronged strategy has been used for writing this paper. On one hand, data for public high schools based in Lahore has been collected and analyzed by plotting on graphs and tested against various hypotheses. Apart from that, three major problems affecting the education system have been identified and three alternatives have been pitched to assess whether replacing these problems with alternate systems can help in improving the public education system, especially at the high school level. The assessment of different policy alternatives has been done through a policy alternative matrix. Lastly, a stakeholder analysis has been done, where different stakeholders affected by public schools have been identified and they have been analyzed on the lines of whether they have low or high interest and whether they yield low or high power. The stakeholder analysis helps in identifying what will be the influence of the stakeholder on the potential policy alternative and its interest in the proposed policy alternative. In the end, the paper is concluded with both qualitative & and quantitative analysis.

Policy Alternative Matrix & Stakeholder Analysis

Stakeholder analysis can be utilized in policy research for a variety of goals, including prospectively informing future policy orientations or retrospectively evaluating stakeholder participation in policy processes. The complete policy cycle is covered, from setting the agenda to developing, adopting, implementing, and evaluating policies (Balane et al., 2020). Whereas the organized process of coming up with, assessing, and selecting alternative courses of action is called policy options analysis. It entails projecting into the future to foresee what will occur because of various

activities that might be taken and then advising actions that will result in the best outcomes (Pitman, n.d.).

Policy Alternatives

The lack of a connection between public school teachers' promotions and their student's grades, the existence of powerful teacher unions, and the prevalence of outdated curricula and archaic teaching methods in public schools are the three major issues that Punjab's public education system is currently dealing with ("Punjab Province", 2018). As the majority of the children in the province attend public schools, these issues are having a negative impact on the children's long-term development (Awan & Zia, 2015; CareerRide, n.d.; Aslam, 2009). The following policy options are suggested to help relieve these issues, replacing the central recruiting system with school-specific hiring, outlawing or severely curtailing the power of teachers' unions, and implementing contemporary curricula and instructional techniques in public schools. These policy options are evaluated according to four criteria: whether they will improve student performance, cut government spending, boost parent and student satisfaction, and be politically viable.

Block Diagram of Methodology

Figure 1

Methodology

Alternative # 1- Replace the Central Recruitment System with school-Specific Hiring on Open Contracts

As public-school teachers serve as election officials during local and national elections, a career in public education is regarded as lucrative in Pakistan because it offers job security, benefits, and opportunities to network with political elites. Consequently, it is suggested that the public-school system's central recruitment method for teachers be discontinued. Additionally, it will save expenses because many public-school teachers receive wages that are significantly greater than those in private schools, in addition to pensions and other privileges. Cost reductions will also result

from the firing of many ineffective teachers. In its stead, school-specific hiring on a contractual basis is required. Under this method, it is not advisable to remove all the current teachers at once because this could cause dissatisfaction among them and make it very challenging financially and administratively to hire all new teachers at once. Instead, there should be no new central hiring and all new school-level recruitments should be on a contractual basis.

While new teachers should be brought in gradually to replace the current ones. The instructors should be engaged on three-year contracts with lump sum salaries, and every six months, their performance should be evaluated based on student behavior and academic achievement. This policy change will stop unionization of the school education system because there will be no longer be a centralized cadre from which to draw strength, in addition to raising educational standards. s,

Assessing Alternative # 1

This policy choice will aid in cost savings because underperforming instructors won't be retained in the system and teachers will be compensated according to their performance rather than receiving general perks. The entire amount spent by Punjab under the heading of salary and pensions for school teachers during the fiscal year 2018–2019 was Rs. 263,016,873,056 (US $ 1,675,266,707). In Punjab, there are 391,799 teachers in total (Government of the Punjab, 2018), making the per-head cost around Rs. 60,000.

Other benefits and services, such as sometimes-provided housing or transportation by the government, are separate. When pay is performance-based, the workforce will be reduced, and pay will be in line with private school salaries in terms of qualifications. The typical income will be around Rs. 40,000, and this will save the average person approximately Rs. 94,031,760,000 (US $ 598,928,408) annually.

This approach will also aid in bettering outcomes and increase student and parent satisfaction. Results will improve because only teachers who continue to perform well will be retained in the system when teachers are engaged on a contractual basis, where their work will be evaluated on a regular basis. As a result, the results will improve, which will raise the level of satisfaction among parents and kids. The outcomes at private schools, which compensate instructors handsomely based on their performance,

have improved recently. Existing teachers and some political forces, though, might be opposed to this approach.

Alternative # 2 Ban or Minimize the Influence of Teachers' Unions

As was already mentioned, the teachers' unions are immensely powerful under the current paradigm, and they frustrate practically any attempt by the government to implement changes in the curriculum or take disciplinary action against instructors. To enhance public schools, it is suggested that teacher unions be outlawed or at the very least, their power be reduced. Although this policy can be implemented through an executive order rather than legislation, teachers are sure to oppose it fiercely. Nevertheless, it will enhance results because the government will be better able to discipline underperforming instructors.

Assessing Alternative # 2

When this alternative is compared to the four criteria, it can be seen that it will provide better results since the government would act only on merit and underperforming teachers wouldn't be protected by a union. Implementing this policy won't cost anything, but it will increase student and parent satisfaction because, as was already mentioned, teachers will be evaluated on their performance and be required to deliver better results, which will lead to higher student satisfaction. This policy choice, however, would not be politically viable since teachers would attempt to recruit opposing parties, which could result in additional strikes and protests.

Alternative # 3 Adopting Modern Education System

While public schools use the obsolete Punjab Textbook Board curricula, private schools use the Oxford/Cambridge-certified curricula. In addition to developing two distinct classes of pupils, which leads to economic inequality and class distinction, this gap in the curricula is also producing a future generation that will find it very challenging to compete with children from high-quality private schools. Most of the white-collar employment, as it was just indicated, goes to youngsters who attend private institutions. Therefore, it is suggested that the government adopt a new curriculum that considers contemporary needs and utilizes cutting-edge teaching techniques. The agency may establish a committee to review the curricula of top private schools and provide suggestions based on best practices.

Assessing Alternative # 3

Because it would be extremely difficult for students to immediately adapt to a new curriculum, this policy approach might not aid in improving results in the short run. As a result, depending on how parents and kids view the issue, their level of satisfaction may rise or fall. This alternative will also cost money for new textbooks, teacher training, and other administrative expenses. Finally, this alternative may run into political opposition from some religious groups because some of these groups have expressed opposition whenever governments have tried to alter the curriculum. The teachers' unions might also use strikes because a whole new syllabus would make many of them obsolete.

Policy Alternative Matrix

Table 1

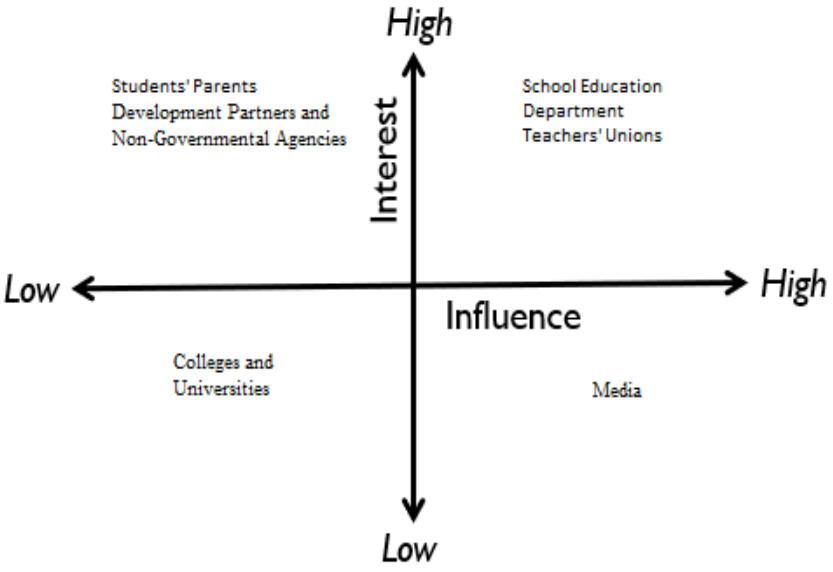
Policy Alternative Matrix

Policy Alternative	Criterion # 1 Improve Results	Criterion # 2 Cost Cutting	Criterion # 3 Satisfy Students and Parents	Criterion # 3 Politically Viable
Replacing central recruitment with school-specific hiring on a contractual basis	+	+	+	+/ -
Ban on teachers' unions	+	+	+	-
Uniform and modern Curriculum	-	-	+/-	+/-

Stakeholder Analysis

Given our policy dilemma and potential policy solutions, significant stakeholders are involved in our analysis. Before making a final choice between policy choices, the government must consider the opinions of these stakeholders and take them into account because no policy can be successful without their interest, ownership, and collaboration. In the paragraphs that follow, important stakeholders will be analyzed, who have been grouped based on their impact and interest.

Figure 2
Stakeholder Analysis



High Influence High Interest

Department of School Education

The School Education Department is the most significant stakeholder because it will take the lead in implementing the policy alternatives. As a result, it's essential that the department, including the entire teaching staff and officials in non-teaching roles, is prepared to put the reforms into place. Your inspiration and encouragement as the department's head and the responsible minister will be crucial to the successful implementation of the policy alternatives because the entire process will fail if the department does not internalize the need for reforms. As a result, it is suggested that you schedule a meeting with all the department's important players to hear their opinions and, if necessary, resolve any of their issues.

Teachers Union

They are a highly significant stakeholder because it has been suggested that a new teacher recruiting system be implemented and that the current teachers' unions be outlawed. It will be appropriate if the department works with the teachers' union and pays attention to their complaints and any

sincere ideas. This must be done to avoid giving them the impression that they are the only ones being targeted by the reforms and that they have been left out of the decision-making process. It is therefore suggested that you organize a conference of significant union leaders after accepting the department (Aslam, 2009).

Low Influence High Interest

Students Parents

Parents of students are highly significant stakeholders in the process because they will be the ones most concerned about their children's education. It is suggested that some of the parents be allowed to join the committee in charge of putting these reforms into effect so that they can be heard and have their legitimate complaints addressed. This will prevent them from being victims of propaganda or fake news, which the media may take up and distort, and it will also help them stay informed of changes. Although this group may not have much of an impact on how policies are made, their recommendations will be very beneficial.

Development Partners and Non-Governmental Agencies

The Department of International Development (DFID), the UK's Department for International Development (UK), and other international development partners are now working together on several development initiatives. There are additionally other organizations. A lot of regional NGOs are also active in the field of education, either with or without official assistance. It is crucial to include each of these players for a variety of reasons. Their support would be crucial for the growth of human resources, financial support, technical aid, and capacity building of the instructors under the new system. First, they might become anxious about the planned changes.

Low-Interest High Influence

Media

As most people would believe what is reported in the media, it is also a crucial stakeholder. Therefore, the department must communicate the suggested policy alternatives in confidence to print, electronic, and social media. The department must inform them of the significance of these measures and how they will help to improve the situation in public schools.

The department may also give them a background study report, along with a definition of the issue and suggested solutions.

Low-Interest Low Influence

Colleges and Universities

Even though public-school reforms are being discussed, many graduates enroll in colleges (CareerRide, n.d.). Therefore, it is essential to consider them and pay attention to their views as they can offer significant and reliable input on curriculum improvement and any issues that need to be resolved at the school level before the kids enroll in college. They may have little interest and little power, yet they are crucial stakeholders for the department when weighing the pros and cons of different policy options**.**

Deciding Between Policy Alternatives

The matrix of policy choices shows that while criterion # 1 is the most viable and criterion # 2 is feasible without regard to political viability, policy alternative #3 may not be feasible when tested against the aforementioned criterion. In order to address the various issues that the public schools in Punjab, Pakistan are currently experiencing, it is suggested that the department adopt the first policy alternative at this time (Islamabad Policy Research Institute, 2015). It is also suggested that technology be used to enhance the educational system in schools (Fernández-Soriano et al., 2019).

Quantitative Analysis

The following facts and figures are provided; the provided hypothesis will be accepted or rejected based on data analysis. The Punjab Education Department provided the information. The public-school statistics for Lahore span four years. Due to a lack of recruiting in recent years, the following years (2019 through 2023) were selected.

Data

The data is based on Lahore schools and is presented below. It includes information on the hiring of new teachers, the typical high school teacher salary, the matric pass rate for grades 16 to 18, and the number of pupils enrolled in matric.

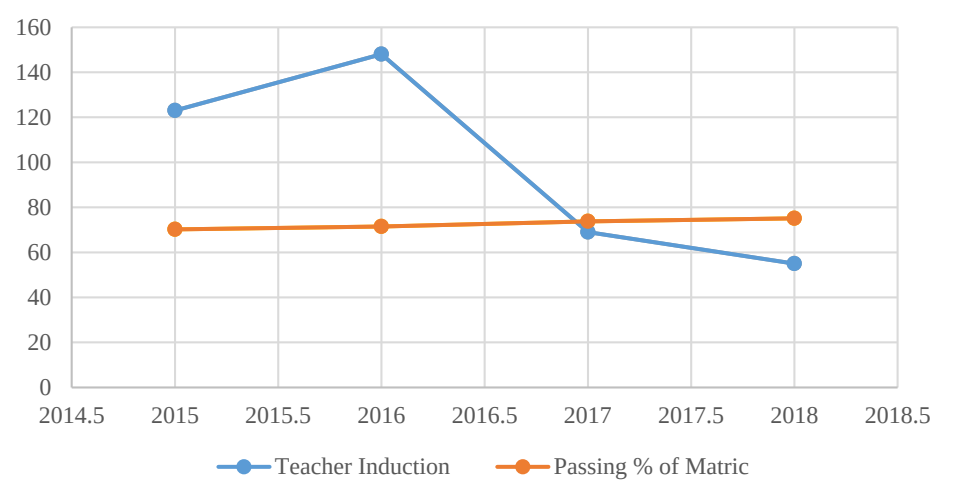
Table 2

Data from Lahore's secondary public schools

Year	2018	2017	2016	2015
Teacher Induction	55	69	148	123
Average Salary (16)	46,620	42,210	35,080	28,430
Average Salary (17)	58,800	53,370	44,740	36,230
Average Salary (18)	74,850	67,050	55,890	45,440
Passing % of Matric	75.14	73.75	71.48	70.18
Students Enrollment in high Schools	105995	105681	104370	100433
Secondary School Teachers	48189	44871	20519	24352
Teacher Student ratio	48189: 105995 High 10	14957: 35227 Good 8	289: 1470 Low 3	24352: 100433 Average 5

Figure 3

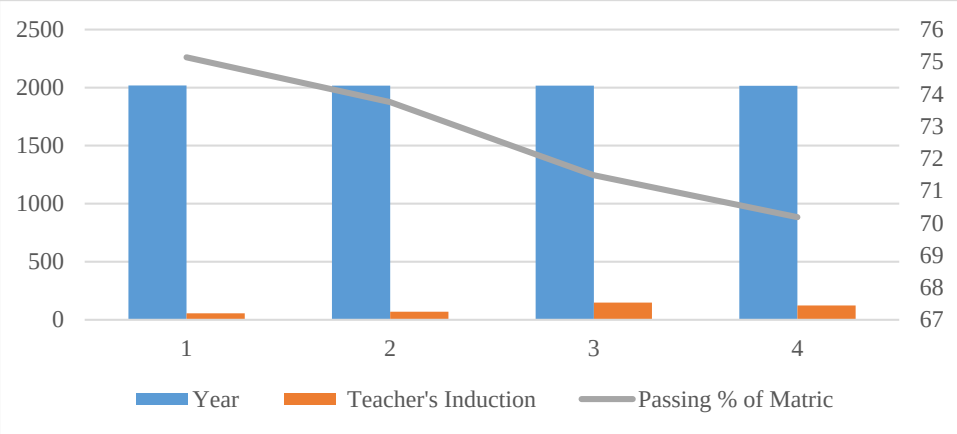
Impact of Teacher's Induction on Students Results



Using information from the table above, Figure 3 illustrates the effect of recruiting teachers at high schools on matric scores. Both indicators are directly proportional, as shown by the graph. More instructors in the classroom will result in better outcomes.

Figure 4

Impact of Teachers Salary on Students Results



The effect of teacher compensation on student achievement is shown in Figure 4. The table is used to extract the data. The graph demonstrates that instructors' performance can improve when given positive incentives, such as a decent income.

Figure 5

Student Teacher Ratio Vs. Matric Results

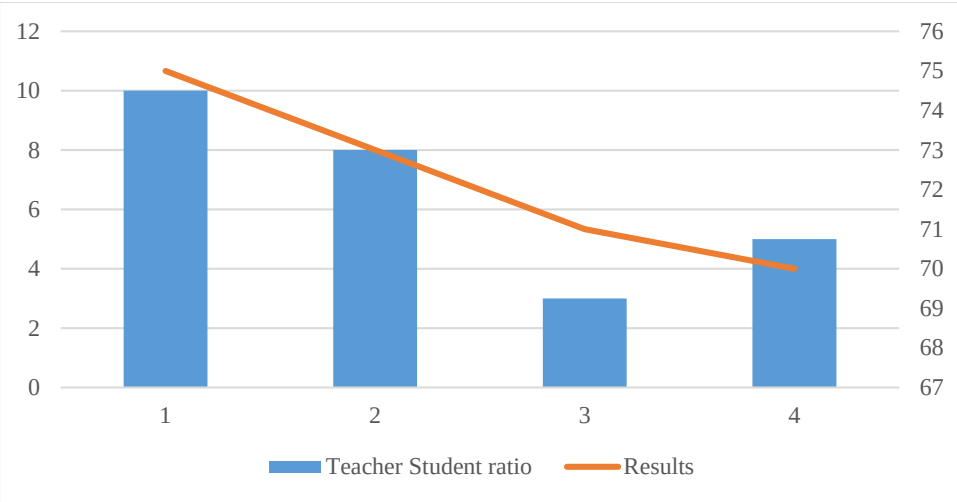


Figure 5 shows the effect of a good teacher-to-student ratio on students' test scores. It is evident that a good ratio has a direct impact on students' test

scores. If the ratio is good, which indicates enough teachers to students, the outcomes are likewise satisfactory.

Results

Based on the graph, the given hypothesis is accepted and rejected as follows:

H0: Good number of teachers hiring shows good academic results for students.

H0: Accepted

H1: By increasing the salaries of faculty, the quality of education also improves.

H1: Accepted

H2: Good Students Teacher Ratio improves the results.

H2: Accepted

H0 is accepted from graph 1, H1 is accepted from graph 2 & H2 is accepted from graph 3.

Further based on Policy Matrix and Stakeholder analysis, it can be concluded that replacing central recruitments with school-specific hiring on a contractual basis is the best available policy as it will reduce politicization in the schools and improve the performance of schools. Department of School Education and Teachers Union has the highest interest and influence in the system and thus they will resist change hence, it is important to introduce policy changes that will bring the desired results and the same is also accepted through graphical analysis and acceptance of the Null Hypothesis.

Discussion

Computer interactive education system in schools is a transformative approach following a key point to understand the effectiveness of computer-based education school system.

Enhanced involvement: Interactive and multimedia-rich content offered by computer-based education systems captures students' attention, encouraging active involvement and enhancing knowledge retention.

Personalized Learning: Adaptive software adapts instructional content to meet the needs of each student, paces the curriculum in accordance with their level of understanding, and offers individualized feedback, encouraging self-directed learning.

Accessible and Inclusive: Computer-based solutions cross geographic boundaries to give students in remote locations access to high-quality education. Students with various learning challenges might also gain from features that are adaptable to their particular needs.

Interactive learning resources: Virtual simulations, instructional games, and multimedia tools encourage students' capacity for critical thought and problem-solving, enhancing the learning experience.

Real-time Assessment: Computer-based education systems enable immediate assessment and feedback, enabling teachers to effectively monitor student development and take appropriate action as soon as it arises.

Challenges and Prevention Techniques

Infrastructure and Accessibility: The implementation of computer-based educational systems might be hampered by inadequate technological infrastructure and restricted access to computers and the Internet. This problem can be solved by working together with public and commercial organizations to offer sufficient resources and connectivity.

Training and support for teachers are essential for them to successfully incorporate technology into their teaching methods. The learning curve and maximizing the potential of computer-based education systems can be accomplished by educators with the aid of professional development programs and continual support.

Digital Divide: Due to economic inequality, less fortunate students may have limited access to technology. This gap can be closed by programs like subsidized gadgets, internet connectivity plans, and collaborations with neighborhood organizations.

Overreliance on Technology: To ensure a well-rounded educational experience, it's critical to establish a balance between technology and conventional teaching techniques. This issue can be resolved by promoting mixed learning strategies that incorporate online and offline activities.

Conclusion

After considering several policy options and conducting a stakeholder analysis, it can be said that policy alternative #3 may not be possible when compared to the aforementioned criterion, however, criterion #1 is the most feasible and criterion #2 is practicable without regard to political viability. To address the various issues that the public schools in Punjab are facing, it is suggested that the department adopt the first policy alternative, which is "replacing central recruitments with school-specific hiring on a contractual basis." Adopting this policy choice will, to some extent, assist in accomplishing the other two policy alternatives. The highly politicized unions will be broken apart thanks to the replacement of the central recruiting method because teachers will be hired on a school-by-school basis and will not have a central relationship. Additionally, they will work to improve student outcomes by implementing current curricula after they become contractual employees with contracts that are extended at the end of each school year. This is also supported by the data as average salary will increase because of the smaller number of teachers, leading to teachers' satisfaction and improved results, however, at the same time leading to less financial burden on the government as burden of pension will decrease and number of teachers will also be reduced as only the most essential teachers shall be hired. Numerous studies have demonstrated that a positive learning environment can also increase student attendance (Hamlin, 2021). It is also clear from the graphs that more teachers are needed in classrooms, and that their base pay must be raised to provide room for the hiring of talented personnel. Finally, it is crucial that the public school system in Punjab adopts the use of ICT technologies to enhance and increase learning processes through interactive technology usage by delivering a modern curriculum and engaging young minds that will help in the improvement of the province in terms of social, technological, and economic indicators.

The computer-based educational system has the power to completely alter the way that education is delivered. This ground-breaking method gives students the abilities they need to succeed in the digital age by increasing engagement, personalizing learning, and boosting accessibility. While issues like the digital divide and limited infrastructure remain, proactive steps can be taken to lessen these barriers and open the door for a more inclusive and successful education system. Accepting

computer-based educational programs in schools is a step towards giving pupils the skills they need to thrive in a world that is changing quickly.

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