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A COMPARATIVE STUDY OF STUDENT-CENTERED AND TEACHER-CENTERED APPROACHES IN ENHANCING LEARNING OUTCOMES OF SECONDARY SCHOOL STUDENTS

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Abstract
This quantitative study surveys the impact of student-centered and teacher-centered teaching methods on the academic performance of secondary school students onexactly within the situation of science teaching. Using a pre-test and post-test quasi-experimental project where 60 Grade 10 students were selected from two schools and casuallyallocated to an investigational group (student-centred) and a control group (teacher-centred) each containing of 30 students. The study expected to measure how each educationmethodeffects students' understanding and preservation of scientific thoughts over a period of four weeks.The student-centred group contributed in inquiry-based learning, combined group workand classroom debateswhere students assumed an active roleshaping their learning experiences. In dissimilarity the teacher-centred group was subjected to traditional lecture-basededucation with a focus on direct teacher-led explanations and organized note-taking.Academic success was assessedfinished a researcher-developed accomplishment test, which was managedbeforehand and after the instructional dated. Numericalexaminationexposedaimportantdevelopment in the post-test scores of the student-centred group likened to the teacher-centred group. The student-centred group establishedaadvanced mean gain in abstractpresentationimportance the confidentproperties of active appointment in the knowledgeprocedure. Allthese resultspropose that student-centredmethods, which foster greater communication, seriousthoughtfuland independence,central to better knowledgeconsequences in subordinate school science teaching.The study highlights the position of includingcollaborative and learner-centredapproaches in current classrooms to surge student inspiration, appointmentand attainment. The results have important insinuations for teaching performs, curriculum progress and teacher proficientgrowth, advocating for a shift near more student-centric trainings in secondary education to enhance learning results.

Keywords: *Student-Centered Learning, Teacher-CenteredEducation, Inquiry-Based Knowledge, Pedagogical Methods, Teacher Training, Enhancing Learning Outcomes.*

Introduction

The method teachers clarify has a big influence on how well students learn. The teaching methods used in the classroom affect how well students know the material, how absorbed they are and how much they recollect over time. The style of teaching controls how students cooperate with the satisfied and how well they can apply what they've educated in real-life circumstances. Previous, common way of teaching has been teacher-centred where the teacher centrals the class with lectures and students mostly listen and provides notes. In this type of

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method, the teacher is the focalcause of information, and students are passive learners primarily receiving information. This wayemphases on covering satisfiedrapidly and doesnot allow much room for students to be energeticallycomplex in their own knowledge.However, over time, professionals have documented that this old-style way of teaching doesnot assistance students deliberateintensely or learn in creative ways. As anoutcome, there has been a move towards student-centred learning. In this method, students take more concern for their learning. They contribute in discussions work with others and solve difficulties on their own. In its place of just receiving information, students aggressively create their own assumed of the physical.

In student-centred classrooms students engage with the factual in a way that allows them to discover, ask queriesand figure belongings out for themselves. Approaches like project-based knowledge, flipped classroomsand helpful learning are usually used in this style. These approaches help students think disapprovinglybe addedoriginaland solve difficulties. They also allow for modified learning, intellectindividually student can learn in the way that the whole thing best for them.Dislike the comprehensivemovenear more cooperating and student-focused teaching, various classrooms in Pakistan, particularly in secondary schools, still method traditional teacher-centred methods. This divergence between what explore says works and what happens in classrooms is ananxiety because it may avoid students from emerging the skills they need for the upcoming. Problems like large class sizes, shortage of properties and imperfect teacher training also make it hard for educators to use newer and more activeapproaches.This training aims to correspondence the efficiency of student-centred and teacher-centred teaching policies in science education at the secondary school level. Science is a subject that requires dangerousthoughtful, problem-solvingand assessment, manufacture it aperfect subject to collapsible how different teaching methods disturb student learning. The study aims to offer data that supports changes in teaching achieves to help students achieve better significances.

Statement of the Problem

Educational improvements in Pakistan highlight the importance of student-centred teaching approaches, many teachers still trust on traditional lecture-based education.This study goals to address the deficiency of explorecomparation the influence of student-centredagainst teacher-centred teaching on student attainment in secondary schools.

bjectives of the Study

The purposes of this study are:

- To assess the abstractpresentation of secondary school students qualified using a student-centredmethod with actions like group discussions and problem-solving.
- To evaluate the academic presentation of students educated using a teacher-centredmethod usuallyconcluded lectures.
- To comparison the efficiency of student-centred and teacher-centred teaching in educating students' learning consequences, particularly in science.

Hypothesis of the Study

H_0 (Null Hypothesis)	There is no important alteration in the learning consequences of students skilled using student-centred and teacher-centred methods
H_1 (Alternative Hypothesis)	There is a important change in the knowledge

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	results of students qualified using student-centred and teacher-centred methods

Literature Review

Teaching methods have aimportantinfluence on student learning and achievement. The discussionamong teacher-centred and student-centredmethods is vital to discussions about actual education. Exploreexpressions that each methodeffects students' learning in different habits.

Student-Centered Learning

Student-centred learning emphases on connecting students in their own knowledgeprocedure. One of the key philosophiessecondary this methodVygotsky's Social Constructivist Theory, which underlines the significant of social statement and teamwork in education. Vygotsky's idea of the Zone of Proximal Development (ZPD) advises that students acquire best when they work together with peers or teachers to solve problems and discoverthoughts they cannot yet controlling alone.Studies have shown that student-centredmethods, like problem-based learning, cluster workand active discussions, can meaningfullyprogress student thoughtful and meeting. For example, Prince (2004) studied various active learning methods and originate that these policiesgrowth student appointment and help them remember knowledge better. Similarly, Felder and Brent (2009) say that obliging learning augments critical thoughtful and long-term maintenance of satisfied. Furthermore, when a group of students collaborate to finish a task, is emphasized by student-centeredness since it improves student-to-student connection (Condelli & Wrigley, 2009).

Teacher-Centered Learning

In dissimilarity, the teacher-centredmethodemphases on throughteaching, where the teacher is the main foundation of information and students listen and take notes. While this method is efficient in delivering content, it is often criticized for encouraging passive learning and not promoting critical thinking or real-world problem-solving skills.Teacher-centred methods are still extensively used, particularly in large classrooms or in regions with limited resourcesbut they are seen as less actual in helping profound knowledge and meeting. According to Mart (2013), Passionate teachers are aware of their responsibility to support students' active learning and to foster their moral and intellectual growth. However, According to Young (2010), the instructor spends the most of the day delivering the lesson's material to the class through projector or whiteboard. Moreover, In a learning setting where the teacher has major responsibility, teacher-centeredness refers to the dissemination of knowledge to pupils (Mascolo, 2009).

Science Education

In the background of science teaching, student-centred learning has shown particular potential. Research advises that when students are aggressivelycomplex in experiments, cooperative projects and problem-solving doings, they develop a stronger sympathetic of technicalideas and their appliedrequests.

Research Methodology

Research Design

This study useful a quasi-experimental proposal with pre-test and post-test control groups to inspect the influence of student-centred and teacher-centred teaching methods on the theoreticalpresentation of secondary school students. The use of pre-tests and post-tests allows the extent of the students' academic presentation before and after the participation, consenting for

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the valuation of any changes attributable to the teaching methods.In this study, the pre-test was managed to both groups at the start of the experiment to evaluate their zero knowledge and sympathetic of the science satisfied. The consequences of the pre-test and post-test were then compared to control the competence of each instructional method in attractive student learning consequences.

Population and Sample

The people for this study limited of all Grade 10 students registered in public schools in the District Shaheed Benazir Abad. The sympathy on Grade 10 students was due to the vertical of this grade in the academic course of students, as it is often a kind year in terms of adhesive for higher education or skilledways. In order to pledge that the study taster was cheerful and author, two like public schools from the district were purposively chosencreated on their alike academic values, teaching staff and school facilities.

From each selected school, 30 students were casually selected to contribute in the study, resultant in a total sample size of 60 students. The students were allocated to one of two groups:

- ✓ Experimental Group (Student-Centred Approach): 30 students
- ✓ Control Group (Teacher-Centred Approach): 30 students

The students in the new group were taught using a student-centred approach, which absorbed on communicating, collective and inquiry-based learning strategies. This elaborateactions such as group discussions, peer teaching, project-based education, and practical experiments. The teacher enabled these activities by guiding students through problem-solving responsibilities, encouraging critical thoughtful, and confident active contribution.

Sampling Procedure

The selection of contributors followed aunplanned sampling method within the schools to confirm that every student had an equal unplanned of being selected for moreover group. This technique was significant to control for any possible bias and guarantee; the results could be comprehensive to the broader population of Grade 10 students in the Sukkur District. The random selection was done in teamwork with the school management to classify students who met the criteria for inclusion in the study and to ensure that no group was methodicallyadvantaged or deprived in terms of prior academic presentation.

Data Collection

Information collection for this study which elaborate the use of pre-test and post-test duties. These tests were calculated to quantity students' sympathetic of science satisfied before and after the involvement. The pre-test administered at the commencement of the study and evaluated the students' starting point knowledge of key scientific ideas and their skill to apply these notions. The post-testmanaged at the conclusion of the 4 weeks instructional period which evaluated the same satisfied but with astrain on measuring any development in students' information and helps as a consequence of the teaching method used.

Data Analysis

The data composed from the pre-test and post-test calculations were analysed using arithmeticalpracticescontrol the achievement of the two educationapproaches. Expressivedata were used to review the presentation of both collectionswhile illativedata, such as the paired t-test or Examination of Covariance (ANCOVA)were used to comparison the unkind scores of the new and control clusters. This allowed for the calculation of whether any experientialchanges in academic presentation were statistically vital and be accredited to the teaching approaches.

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Research Instrument

A 30 samples multiplechoice test was advancedgrounded on the Grade 10 science curriculum. The test was directed with 20 students and refined for clearness and consistency (Cronbach's Alpha = 0.81).

Intervention Facts

Group	Teaching Methods	Duration
Student-Centered	Inquiry-based learning Group work Peer teaching Classroom discussions	4 weeks (20 lessons)
Teacher-Centered	Lectures Note transcript Rote memorization Teacher-led interrogative	4 weeks (20 lessons)

Both groups were taught the same units in science under similar classroom circumstancesopposing only in instructional means.

Data Analysis

Descriptive Statistics

Group	N	Pre-Test Mean	Post-Test Mean	SD (Post-Test)
Student-Centered	30	42.3	78.5	6.2
Teacher-Centered	30	41.8	68.2	7.4

Inferential Statistics

An autonomous sample t-test was used to comparison post-test measures:

Test Type	t-value	df	p-value	Significance
Post-Test	5.12	58	0.000	Significant at $p < 0.05$

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Findings

1. **Improved Academic Performance Across Both Groups:**
   Both the student-centred and teacher-centred groups showed development from pre-test to post-test, representative that instruction had a positive resultirrespective of process.
2. **Greater Gains in the Student-Centred Group:**
   The student-centred group accomplished a significantly higher unkind post-test score (78.5) compared to the teacher-centred group (68.2)with a mean difference of 10.3 points.
3. **Statistical Significance:**
   The variance in post-test scores between the two groups was statistically significant ($t = 5.12$, $p = 0.000$), corroborative the substitute hypothesis that student-centredapproaches result in better academic results.
4. **Enhanced Engagement and Critical Thinking:**
   The student-centredmethod led to greater engagement, collaboration and opportunities for critical thinking, causal to superior learning consequences.
5. **Teacher-Centered Limitations**

Whilereal to a degree, the teacher-centred method helped passive learning and limited student contact which may delay deeper understanding of scientific concepts.

Discussion

The student-centered group exhibited better academic presentationlikely due to increased student engagement also collaborative learningand critical thinking chances. The teacher-centered groupwhile improved and showed more passive knowledgepropensities. These results support existing literature supporting for active learning surroundings to improve student outcomes.

Recommendations

1. **Integrate Student-Centred Strategies in Curriculum:**
   Schools should join inquiry-based learning, group work earl teaching and classroom debates into science instruction to substituteserious thinking and improve academic results.
2. **Professional Development for Teachers**:
   Teachers should receive training on how to effectively implement student-centred approaches in the classroom, including strategies for easing active data and managing group subtleties.
3. **Policy Reforms in Teaching Practices:**
   Educational representatives should inspire a shift from traditional teacher-led instruction to more collaborating and student-focused methods finished curriculum measures and teaching morals.
4. **Address Structural Barriers:**
   To support student-centred learning, educational establishments need to speech challenges such as large class sizes, lack of incomes, and deficient classroom facilities.
5. **Further Research Across Contexts**
   Future studies should explore the efficiency of student-centredknowledge in other subjects and educational levels to authenticate its generalizability and imprint.
6. **Blended Approach Thought**
   While student-centred methods show clear benefits, a balanced integration with teacher-centredplans may be necessary in backgrounds with limited resources or inflexible curricular demands.

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Conclusion

Overall the literature supports the idea that student-centred teaching is additionalgenuine for confident student appointment also deeper learning and better academic repetitive. Though, old-style teacher-centred methods continue to lead plentiful classrooms andmainly in developingareas. This study aims to comparison the competence of these two approaches in the condition of secondary school science knowledge in Pakistan.

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