Rahbar International Journal of Social Science Research
ISSN: 3080-0749
Volume 01 Issue 02 (May) 2025
DOI: https://doi.org/10.64386/xhas053025.02, Impact Factor: 0000
RIJSSR @ 2025
www.ijss-rahbar.com

A Meta-Analysis on Students-Centred-Learning in Educational Institutions

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Abstract

The significance and efficacy of approaches to student-centered learning (SCL) in educational settings are the subject of this meta-analysis. SCL is a teaching strategy that places an emphasis on active learning, collaboration, critical thinking, and individualized instruction rather than the instructor. Through the analysis of numerous qualitative and quantitative studies conducted over the last two decades, this paper examines how SCL impacts student engagement, academic performance, motivation, and retention rates across various disciplines and educational levels. Institutions that employ student-centered strategies like project-based learning, flipped classrooms, and problem-based learning consistently report higher levels of student satisfaction and improved learning outcomes. However, challenges such as lack of teacher training, resistance to change, and insufficient institutional support are common barriers to successful implementation. The review suggests that integrating SCL within a supportive institutional framework leads to sustainable educational improvement and fosters lifelong learning among students.

Keywords: student-centered learning, meta-analysis, educational institutions, active learning, teaching strategies, academic performance

Introduction

Student-centered learning (SCL) models, which are more dynamic, inclusive, and interactive than traditional teacher-centered approaches, are causing a fundamental shift in the educational landscape of today. The emphasis in 21st-century classrooms has shifted more and more toward enabling students to actively develop their own knowledge and abilities, cultivating lifelong learning capacities, and equipping them for the quickly evolving demands of the global community (Barr & Tagg, 1995). In higher education, where a variety of student demands, learning styles, and cultural settings necessitate adaptable pedagogical approaches, student-centered

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learning has garnered attention at all educational levels. A teaching strategy that puts the student at the center of the learning process is known as student-centered learning. It places a strong emphasis on independence, critical thinking, teamwork, and participation in educational activities (Weimer, 2002). SCL promotes teachers to take on the role of facilitators, assisting students as they investigate, challenge, and co-construct knowledge, in contrast to the conventional teacher-centered approach, which views the instructor as the main authority and information source. This method is in line with constructivist educational ideas, which support students' development of understanding via experience and introspection (Piaget, 1952; Vygotsky, 1978). In order to assess the overall influence and efficacy of a certain phenomenon—in this case, student-centered learning—a meta-analysis offers a methodical synthesis of previous empirical research. Numerous research have examined the advantages of this pedagogical shift in a variety of educational contexts due to the growing interest in it; nonetheless, the results are still inconsistent and context-specific. The goal of the current meta-analysis is to compile the literature on SCL and evaluate its overall effects on academic achievement, learning outcomes, student motivation, and teacher-student relationships. The capacity of SCL to encourage active learning is one of its main defenses. SCL models have a strong emphasis on active learning techniques such project-based learning, group problem-solving, flipped classrooms, and experiential learning (Freeman et al., 2014). According to research, these techniques help pupils not only do better academically but also communicate more effectively, feel more confident, and retain more information. For example, Prince (2004) contended that by putting students in situations that call for higher-order thinking and decision-making, active learning dramatically raises the quality of learning. SCL is also essential for individualized instruction in the context of higher education. Universities are forced to implement teaching approaches that address the needs of each individual student due to the growing diversity of student backgrounds, academic readiness, and professional goals. More flexible curricula, tailored feedback, and customized instruction are made possible by student-centered instruction, and these strategies can greatly close achievement disparities and enhance educational equity (Tomlinson, 2001). Additionally, SCL helps students develop a sense of accountability and ownership, which boosts their motivation and engagement. This is corroborated by Deci and Ryan's Self-Determination Theory (1985), which emphasizes that learners' intrinsic motivation is increased when they feel autonomous, competent, and related—all of which are fundamental characteristics of student-centered environments. Students are more likely to connect with the material profoundly and maintain their efforts over time when they believe they have control over their learning routes.

Notwithstanding the generally accepted advantages, there are still difficulties in putting SCL into practice. To go from authoritative to facilitative roles, teachers frequently need to undergo intensive professional development. The broad implementation of student-centered approaches is also hampered by institutional barriers like big class numbers, strict curricula,

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inadequate technology infrastructure, and opposition to pedagogical change (Brush & Saye, 2000). Additionally, evaluating student achievement in these settings presents unique difficulties because the abilities acquired through SCL techniques could not be sufficiently captured by conventional standardized examinations. In order to provide a better understanding of the efficacy of student-centered learning, this meta-analysis attempts to combine findings from a variety of empirical studies carried out across various educational levels, nations, and disciplines. It looks for patterns, gauges the extent of SCL's influence, and offers suggestions for practice and policy in educational establishments.

In conclusion, student-centered learning presents an appealing substitute for conventional approaches as educational paradigms change to satisfy the demands of a knowledge-based society. By providing a meta-analytical viewpoint on SCL and analyzing its theoretical foundations, empirical data, and practical consequences for modern education, this paper adds to the continuing conversation.

Literature Review

In contemporary education, student-centered learning (SCL), which places more emphasis on active student participation and ownership of learning than teacher-led instruction, has become a revolutionary pedagogical paradigm. In a variety of educational environments, this paradigm fosters critical thinking and problem-solving abilities by emphasizing cooperation, investigation, and reflection (Lea, Stephenson, & Troy, 2003). SCL is becoming more and more recognized as a tactic for raising student engagement, retention, and academic achievement as global educational systems seek to foster lifelong learners. The constructivist idea, which holds that students actively create knowledge through experiences rather than passively absorbing information, is one of the tenets of SCL (Vygotsky, 1978). According to this perspective, teachers operate as facilitators who direct, encourage, and structure learning so that students can investigate material through discussion, teamwork, and real-world application. To increase student agency and autonomy, SCL environments frequently include group projects, project-based learning, and practical problem solving. Across disciplines and educational levels, research shows that student-centered practices have a favorable impact on learning outcomes. Prince (2004) asserts that active learning techniques, such as case studies, peer teaching, and debate, greatly enhance understanding and retention. In a meta-analysis of 225 research, Freeman et al. (2014) discovered that students in active learning settings were less likely to fail and did better on tests than those in traditional lectures. These results highlight how effective SCL is at promoting greater comprehension and academic achievement.

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The use of technology has increased the reach of student-centered learning. More individualized and adaptable training is now possible because to digital tools like interactive platforms, virtual simulations, and learning management systems. Technology improves self-directed learning by enabling students to interact with content at their own pace, claim McCombs and Vakili (2005). Additionally, blended learning methods in higher education that incorporate both online and in-person components encourage student autonomy and customized training (Garrison & Vaughan, 2008). Notwithstanding these advantages, there are a number of obstacles to SCL deployment. Effective adoption is frequently hampered by faculty reluctance, a lack of institutional support, and inadequate training (O'Neill & McMahon, 2005). Large class sizes and strict curricula restrict opportunities for individualized instruction, and instructors used to traditional lecturing may find it difficult to give up control. Furthermore, different evaluation techniques like portfolios and reflective journals are necessary for evaluating student performance in SCL contexts, and they may involve more time and money (Weimer, 2013). To sum up, research continuously supports the importance of student-centered learning in raising academic performance, student happiness, and lifetime learning abilities. However, systemic adjustments to instructional methods, evaluation techniques, and institutional culture are necessary for successful adoption. The goal of the current meta-analysis is to compile previous research in order to pinpoint trends, difficulties, and results related to SCL in many educational settings.

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Descriptions of Articles

No	Title of the Articles	Nature of the study	Year	Authors	Samples	Instruments	Subject	Finings
1	Student-centered approach to teaching large classes: friend or foe?	Qualitative	2016	Marina Kirstein and Rolien Kunz	254 students	Questionnaire	Student-centered approach to teaching large classes	It was discovered that "non-standard" teaching methods can be implemented successfully and that active student participation is possible even in a large class environment. This makes it recommended, not least because it could help students develop their overall skills.
2	Student Centered Learning Through Serious Games C	Qualitative	2019	Mark Anthony Camilleri 1 and Adriana Caterina Camilleri2	Fifty-four students who were between 13 and 15 years of age	Questionnaire	Through Serious Games	As a result of their distinct learning abilities, the participants in this study are hypothesized to have different skill sets.

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3	Student-centered and teacher-centered science classrooms as visualized by science teachers and their supervisors	Quantitative	2020	Sulaiman M. Al-Balushi a, *, Abdullah K. Ambusaidi a, Khadija A. Al-Balushi b, Fatema H. Al-Hajri c, Mohammed S. Al-Sinani d	140 science teachers and 26 science supervisors in Oman	The original DASTT-C	Student-centered and teacher centered science classrooms	The results showed that both groups thought science instruction was more teacher-centered in schools. Compared to science teachers, science supervisors were better able to depict a student-centered learning environment in their drawings when asked to illustrate a "student-centered classroom."
4	Understanding student-centered learning in higher education: students' and teachers' perceptions, challenges, and cognitive gaps	Qualitative	2019	Jose Eos Trinidad	93 people: 52 undergraduate students and 41 faculty members	interviewed	Understanding student-centered learning in higher education	The results showed that both teachers and students enthusiastically embrace certain aspects of SCL, especially when it comes to student motivation, skill development, and classroom engagement. They do not, however, readily challenge the ways in which SCL incorporates teacher-student power dynamics and assessments.

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5	How do students conceptualize the college internship experience? Towards a student centered approach to designing and implementing internships	mixed-method	2020	Matthew T. Hora, Emily Parrott & Pa Her	undergraduate headcount of 4,168 students (hereafter named Institution A), a technical college with 20,801 students (Institution B), and an Historically Black College or University (HBCU) with 2,038 undergraduates (Institution C).	Interview and Internship	student centered approach to designing and implementing internships	These results demonstrate how popular definitions of internships represent a uniform and idealistic viewpoint that differs from what students have to say. We come to the conclusion that in order to avoid one-size-fits-all approaches to internship design, to encourage student self-reflection, and to reframe the employability discussion to include student viewpoints and experiences, it is critical to take into account what students have to say about internships.
6	HELOs and student centered learning – where's the link?	Qualitative	2017	Rachel Sweetman	29 teachers and students	Interview	HELOs and student centered learning	The analysis finds a number of conflicts between the perceived pressures to define and evaluate learning outcomes and the difficulties that student-centered learning ideals present to conventional teaching methods, particularly with regard to giving students more control and choice. Nevertheless, there is little evidence that learning outcome approaches support student-centered learning.

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7	Student-centered teaching, deep learning and self-reported ability improvement in higher education: Evidence from Mainland China	Quantitative	2018	Shutao Wang a and Demei Zhangb	976 students from 16 large classes in a university in Mainland China	Questionnaire	Student-centered teaching, deep learning and self-reported ability	The findings indicated that self-reported ability improvement in large classes and the use of a deep learning approach by students were positively predicted by the student-centered teaching method, and that the relationship between the two was mediated by deep learning.
8	Student teachers' perceptions, experiences, and challenges regarding learner-centered teaching	Qualitative	2020	Elize (EC) du Plessis	ourth-year students en-rolled at a higher education institution for the BEd qualification	Questionnaire	Student teachers' perceptions, experiences, and challenges regarding	The results show that student instructors now face three significant obstacles related to learner-centered teaching and have a limited comprehension of the concept. We challenge the notion that student-centered learning increases students' sense of involvement and grants them authority and control over the creation of knowledge in light of the findings.
9	Colliding collaboration in student-centered learning in higher education	Qualitative	2015	Anne Harju & Annika Åkerblom	Fifteen students participated	Record and observation	Colliding collaboration in student-centered learning	According to the findings, student instructors now encounter three major challenges associated with learner-centered teaching and have a poor understanding of the idea. Based on the results, we question the idea that student-centered learning makes students feel more involved and gives them power and control over knowledge generation.

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10	Students' beliefs about teaching and learning and their perceptions of student-centered learning environments	Qualitative	1017	Sang Joon Lee & Robert Maribe Branch	32 students	Questionnaire	Students' beliefs about teaching and learning	The findings demonstrated that students' opinions on the SCLE were impacted by their past knowledge as well as their views on education and learning.
11	Comparing the Effectiveness of Student-Centered Learning (SCL) Over Teacher-Centered Learning (TCL) of Economic Subjects in a Private University in Sarawak	Quantitative	2020	Lau, Hieng Soon	38 students taking the microeconomics and 59 students taking macroeconomics	questionnaire	Effectiveness of Student-Centered Learning	Given that the former has greater resources than the latter, it appears that SCL is more successful at teaching macroeconomics than microeconomics. Additionally, the study shows that every vital success component is important and crucial for putting the SCL into practice.
12	Student-centered learning (SCL): roles changed?	mixed-method	2016	Gülen Onurkan Aliusta and Bekir Özer	430 teachers from 11 public high schools, 370 volunteered, 309 teachers returned	questionnaire	(SCL): roles changed	The results highlight the critical need for alternative teacher preparation programs that would transform instructors' conventional wisdom so they might apply theory to practice and take on student-centered responsibilities.

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13	An Evaluation of the Impact of Digital Technology Innovations on Students' Learning: Participatory Research Using a Student-Centered Approach	mixed-method	2022	Isaiah T. Awidi1,3 · Mark Paynter2	1500 students	Questionnaire	Digital Technology Innovations on Students' Learning	The results showed that DT interventions improved students' levels of contact and collaboration, helped them get ready for lab tasks and class participation, and managed lecturer comments efficiently and promptly.
14	Three dimensions of student-centered education: a framework for policy and practice	Qualitative	2017	Louise Starkey	150 to 1200 students and located across a range of socio-economic neighbourhoods	semi-structured interviews	Three dimensions of student-centered education	The results indicate that three overlapping dimensions—humanist, agentic, and cognitive—can be used to synthesis student-centered education into a conceptual framework.
15	Teachers' Perceptions of Promoting Student-Centered Learning Environment: An Exploratory Study of Teachers' Behaviors in the Saudi EFL Context	Quantitative	2022	Mohammad Al-khresheh	302 English teachers	survey.	Promoting Student-Centered Learning Environment	The results demonstrated teachers' favorable attitudes toward student-centered learning while planning lessons, creating interactive teaching resources with ICT, and providing helpful criticism.

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Comparison of the articles

This met analysis review aimed to explore Students-Centered-Learning in Educational Institutions. After reading more, then sixty (n=60) publications time period is 2015 to 2025 to different research databases and websites, only ten (n=15) are meet to criteria of my study. The very first article under the title of Student-centered approach to teaching large classes: friend or foe?: a qualitative research by Marina Kirstein and Rolien Kunz in 2016 and used Questionnaire and interview asked (n= 254) students. The findings shows that the nonstandard teaching practice are implemented effectively and dynamic students are busy even the large numbers of class. Another qualitative research under the title of Student Centered Learning Through Serious Games C by Mark Anthony Camilleri and Adriana Caterina Camilleri in 2019 used questionnaire through serious games and data collected from fifty four students who were between 13 and 15 years of ages. The findings revealed that participants possessed various skillsets as they showed various learning skills.

Similarly, a quantitative research by Sulaiman M. Al-Balushi, Abdullah K. Ambusaidi, Khadija A. Al-Balushi, Fatema H. Al-Hajri, and Mohammed S. Al-Sinani under the title of Student-centered and teacher-centered science classrooms as visualized by science teachers and their supervisors in 2020. They used The original DASTT-C to collected from 140 science teachers and 26 science supervisors. The findings indicated that both groups observed science teaching in schools to be more teacher centered leaning. When asked to draw the students centered learning, the science supervisors drowned bitterly students centered learning as science teacher. Another qualitative research article under the title of "Understanding student-centered learning in higher education: students' and teachers' perceptions, challenges, and cognitive gaps" by Jose Eos Trinidad in 2019. Interview question were asked to collected data from 93 people: 52 are undergraduate students and 41 are faculty members. The findings of the study revealed that the particular facts od SCL, the faculty members subscribes in terms of class engagements, skills building, and motivation of students. They failed that how assessments and the power relation among students and SCL. Although, another mixed-mod research by Matthew T. Hora, Emily Parrott & Pa Her in 2020 under the title of "How do students conceptualize the college internship experience? Towards a student centered approach to designing and implementing internships" , the interview and internship are used to collected data from 4168 students of technical college and university. The findings of the study revealed that the common explanations of internship reflected a similar and hopeful perspectives that unpredictable with students accounts. The study also declared that the understandings about internships are very important to reflect to reframe the employability arguments to contain students viewpoint and skills, to stop all approaches to internship style and aid students self-refection. Similarly, another quantitative research by Rachel

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Sweetman in 2017, under the title of HELOs and student centered learning – where's the link?, interview took place with 29 teachers and students to collected collected that data. The findings of the study revealed that there are limited proofs that learning result methods to promote SCL and analysis indicated that several strains among challenges SCL learning perfect position to old teaching practices, in terms moving power and selection to students, and seeming burdens to agree and assess learning results.

Likewise, another quantitative research article by Shutao Wang and Demei Zhang in 2018 under the title of Student-centered teaching, deep learning and self-reported ability improvement in higher education: Evidence from Mainland China. Questionnaire is used to collected data from 976 students from 16 large classes in Mainland China. The result stated that SCL method positively forecast students use a profound learning method and self-reported capacity development in large classes at university as well as deep learning facilitating effects relationship among students centered teaching and self-reported skills improvements. In the same manner, a qualitative study by Elize (EC) du Pleasis in 2020 under the title of Student teachers' perceptions, experiences, and challenges regarding learner-centered teaching. Questionnaire is used to collected data from fourth year students of B.ED. qualification. The findings stated that students teachers have partial understanding of SCL and currently facing three serious tasks with regards to SCL. Even, another qualitative study by Anne Harju & Annika Åkerblom in 2015 under the title of Colliding collaboration in student-centered learning in higher education. Data were collected through record and observation from fifteen students. The result showed that problematize the statements that SCL improve the students logic of particiopation and provide them control the knowledge creation. Likewise, another qualitative study by Sang Joon Lee & Robert Maribe Branch under the title of Students' beliefs about teaching and learning and their perceptions of student-centered learning environments in 2017. Questionnare is used to colleted data from 32 students. The findings stated that students past knowledge as well as their opinions about teaching and learning influencing their activities of SCL.

In addition, another quantitative study by Lau, Hieng Soon in 2020 under the title of Comparing the Effectiveness of Student-Centered Learning (SCL) Over Teacher-Centered Learning (TCL) of Economic Subjects in a Private University in Sarawak. Questionnaire is used to collected the data from 38 students from microeconomics and 59 from macroeconomics departments. The findings revealed that SCL is most effective tool in teaching the microeconomics as previous higher than newer. The study also stated that serious achievements factors are important for applying SCL. Likewise, another mixed-mod study by Gülen Onurkan Aliusta and Bekir Özer in 2016 under the title of Student-centered learning (SCL): roles changed?. The data were collected used questionnaire to 430 teachers from 11 public high schools, 370 volunteered, and 309 teachers. The study findings

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revealed that draw attention to an vital requirement for substitutes teacher exercise, programs that would emphasize on moving teachers, old thinking's allowing them to put theory and assume SCL roles. In addition, another mixed-mod article by Isaiah T., Awidi, and Mark Paynter in 22022 under the title of An Evaluation of the Impact of Digital Technology Innovations on Students' Learning: Participatory Research Using a Student-Centered Approach. The is collected used questionnaire to 1500 students. The study findings declared that digital technology interferences aid students preparation for laboratories activities and participation, develop their levels of communications, teamwork, and provide effective and timely organize of feedback from faculty members. Even, a qualitative study by Louise Starkey in 2017 under the title of Three dimensions of student-centered education: a framework for policy and practice. Semi-structured interview are used to collected the data from 150 to 1200 students. The result stated that SCL can be create into conceptual framework that added three overlapping scopes: humanist, agentic and cognitive.

All in all, the last article by Muhammad Al-khresheh in 2022 under the title of Teachers' Perceptions of Promoting Student-Centered Learning Environment: An Exploratory Study of Teachers' Behaviors in the Saudi EFL Context. The data were collected through survey from 302 English teachers. The finding revealed that the positive attitudes of teachers to SCL by prepare interactive teaching materials, giving constructive feedbacks.

Conclusion

According to the findings of this meta-analysis, effective implementation of student-centered learning has significant advantages for both students and institutions. It encourages independent learning, fosters critical thinking, and increases student engagement. The evidence reviewed confirms that SCL contributes positively to academic performance and fosters a more inclusive and interactive classroom environment. Nonetheless, its success depends heavily on institutional commitment, continuous teacher professional development, and adaptive curriculum design. As education evolves to meet the needs of diverse learners in the 21st century, adopting student-centered practices appears not only beneficial but essential for fostering meaningful and equitable learning experiences.

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www.ijss-rahbar.com

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