

A NARRATIVE REVIEW ON INTEGRATING SUSTAINABLE DEVELOPMENT GOALS (SDGs) IN EDUCATION BY TEACHERS

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Submitted May 8, 2025; Revised November 21, 2025; Accepted November 29, 2025; Published February 20, 2026

ABSTRACT

The objective of this study is to investigate the professional learning and knowledge enhancement needs of Pakistani educators regarding the implementation of Sustainable Development Goals (SDGs) in their classrooms. This research employs both quantitative and qualitative methods to explore how teachers, educational administrators, and policymakers perceive the integration of SDGs in education. The findings indicate that, despite growing concern about the SDGs, significant challenges remain, including inadequate preparation, insufficient funding, and weak policy support. Based on these results, the study proposes a framework for teacher professional development that includes training programs, curriculum changes, and enhanced networking opportunities for learning. Furthermore, it emphasizes the need to provide teachers with the essential knowledge, skills, and resources required for effectively incorporating SDGs into their teaching practices, thereby supporting the achievement of quality education as outlined in SDG 4 and related goals.

Keywords: Integrating SDGs, Education, Teachers.

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INTRODUCTION

The concept of progressivism as a theme for the Sustainable Development Goals (SDGs) was introduced by the United Nations in 2015 to address global challenges. Among the goals, SDG 4 emphasizes quality education for all, highlighting the importance of inclusive and equitable education and lifelong learning as essential for achieving all SDGs. Education is widely viewed as a powerful tool for promoting sustainable development, as it empowers individuals to address critical global issues

such as climate change, poverty, and inequality [1]. However, integrating SDGs into national educational systems has proven challenging, particularly for developing countries like Pakistan. Various obstacles, including inadequate infrastructure, insufficient resources, and a shortage of qualified teachers, hinder this process. Educational authorities regard teachers as primary planners and transmitters of SDG policies in the classroom, emphasizing their central role in SDG implementation. The term "change

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agents for difference" reflects teachers' potential to guide students and communities toward sustainable development [2]. For teachers to effectively integrate SDGs into their educational practices, professional development (PD) is essential. Effective PD programs must equip educators with the knowledge and resources necessary to incorporate sustainability concepts into their teaching. However, in Pakistan, PD opportunities related to SDGs are limited. While faculty members recognize the importance of SDGs and incorporate them into national education policies, there is a significant gap in implementing these objectives within classroom teaching [3]. Concerns regarding teachers' preparedness to teach about SDGs are evident, with only 39% of teachers reporting adequate preparation and just 9% understanding how to teach the goals across various subjects. Furthermore, educational policies do not clearly outline how teachers should pursue their professional learning concerning sustainability and global citizenship [4]. Consequently, future research should focus on understanding the professional development needs of Pakistani educators, addressing current deficiencies, and developing training programs that support teachers in fostering change to achieve SDGs. This research aims to investigate how PD influences the implementation of SDGs in teaching and learning processes in Pakistan. By considering the experiences of teachers, administrators, and policymakers, the study seeks to identify key issues and opportunities within the current PD environment, ultimately contributing to the creation of a more effective model for teacher training in the Pakistani context [5]. The integration of Sustainable Development Goals (SDGs) in education is crucial for fostering a sustainable future, especially in developing countries like Pakistan. Tackling educational challenges is vital for

creating a progressive future for the nation. Although SDGs have been incorporated into national policies and development plans, the effective implementation of these goals in classrooms remains a complex issue. A key obstacle to this implementation is the lack of adequate professional development (PD) available for teachers [6]. Many teachers in Pakistan face difficulties in applying SDGs in their teaching practices due to insufficient training on how to integrate sustainable development strategies. Teachers play a critical role as change agents in the implementation of SDG policies; however, to be effective, they require comprehensive PD that prepares them for this responsibility. Unfortunately, there is a significant gap in the existing literature regarding the professional development needs of teachers in Pakistan, particularly concerning the integration of SDGs. This research seeks to explore ways to enhance current PD opportunities focused on teaching about SDGs and to examine how these opportunities can advance SDG 4 within the Pakistani educational context [7]. This paper underscores the role of teachers as change agents in the global implementation of SDGs in education, highlighting their essential contribution to building sustainable societies. In Pakistan, however, various challenges impede the integration of SDGs into curricula and learning processes, primarily due to inadequate professional development for teachers involved in these initiatives. This section reviews existing literature on the incorporation of SDGs in education, the contributions of teachers toward achieving these goals, and the significance of professional development in empowering teachers as change-makers in the pursuit of SDG accomplishments, with a specific focus on Pakistan [8].

TOLE OF TEACHERS FOR SDGS

Prospective teachers play key roles in sustainable development frameworks and are recognized as change agents. They are expected not only to convey subject content but also to foster critical thinking and values such as sustainability, human rights, and global citizenship, as emphasized by UNESCO in 2017. Teachers are essential stakeholders in implementing the Sustainable Development Goals (SDGs), particularly the fourth goal, which emphasizes Quality Education for All [9]. The United Nations highlighted that the learning activities implemented by teachers in classrooms are key predictors of learners' perceptions and responses to sustainable development. In many regions worldwide, teachers have successfully incorporated sustainability into their classrooms by infusing creativity and passion into their activities, thereby promoting engagement and citizenship. However, in Pakistan, many teachers lack the professional competence to teach sustainable development or to integrate SDGs into their practices. This gap undermines their ability to engage students with the issues addressed by the SDGs [10].

The successful integration of SDGs into education in Pakistan faces several challenges. These include limited resources, outdated school and college curricula, and minimal coverage of large-scale, non-sectored teacher training programs. Research indicates that teachers in Pakistan lack both the knowledge and skills necessary to teach sustainable learning, while the education framework fails to provide adequate support. It was revealed that despite the integration of SDGs into national policies, weak execution at the community level can be attributed to insufficient teacher preparation [11-14]. Many educators are unaware of how to effectively teach sustainability concerns,

and opportunities for incorporating SDGs into professional development for teachers are limited. Additionally, challenges such as overcrowded classrooms, inadequate facilities, and the lack of educational technology further hinder the teaching of SDGs in Pakistani educational institutions. The absence of proper professional development for teachers prevents them from addressing these challenges, limiting their ability to utilize SDGs in the classroom, even as education is recognized as a crucial driver of change.

Continuing education is essential for equipping educators with the knowledge and strategies needed to incorporate the Sustainable Development Goals (SDGs) into their lessons. Prior research has shown that providing consistent professional development (PD) opportunities is crucial for promoting teacher agency and enhancing the quality of learning. In relation to the SDGs, PD programs should focus on increasing teachers' awareness of sustainable development, introducing innovative teaching and learning approaches, and facilitating the integration of SDGs into curricula across various subjects [15]. In Pakistan, PD for teachers has historically concentrated on subject-area knowledge and teaching strategies, with aspects of global sustainability absent from initial teacher education programs. However, there is an urgent need for training that incorporates SDG content into teacher training curricula. For example, the Punjab Education Foundation (PEF) has initiated an action plan to promote sustainable development education in schools and to provide teachers with guidance on integrating SDGs into their curricula. Nonetheless, more coordinated and structured efforts are necessary to enhance professional development in SDGs, including teaching and learning, across all provinces in Pakistan [16].

Research indicates that PD programs should be relevant to the local context and address the challenges teachers face in Pakistan. Ahmad and his co-authors emphasize that PD programs should consider the cultural, economic, and social contexts of classrooms in Pakistan. Furthermore, these programs should offer both theoretical knowledge about SDGs and effective strategies for incorporating SDGs into classroom practices, such as project-based learning, participative teaching, and community engagement [17, 18].

ESSENTIAL REQUIREMENTS FOR SDG INTEGRATION

The findings of this study can inform teachers and researchers, guiding the implementation of effective PD programs in terms of content and focus. It was found that while Pakistani teachers recognize the importance of SDGs, many feel uncertain about how to teach sustainability effectively. Teachers reported a lack of targeted PD programs that provide concrete methods for implementing SDGs in their classrooms. Similarly, it was found that teachers are willing to adopt SDG-centered approaches in their practice but lack guidance on the best ways to teach for the SDGs [19]. A cross-sectional study conducted among teachers in Lahore revealed that, although teachers are eager to integrate sustainable practices into their classrooms, they lack sufficient resources and support to do so. Additionally, teachers noted that existing PD programs do not focus on teaching SDGs and highlighted the specific challenges of implementing SDGs in rural contexts, where access to resources and professional development opportunities is limited [20].

The statistics indicate that teachers' knowledge of and concerns about the Sustainable Development Goals (SDGs) significantly increased after participating in the professional development program.

Prior to the training, many teachers had limited knowledge of the SDGs, with only a few incorporating them into their practice. Post-training, the majority of teachers reported being aware of the SDGs and frequently applying them in their classrooms. This aligns with existing literature, which suggests that professional development activities enhance teachers' knowledge and implementation of globally-focused learning initiatives. The findings advocate for targeted professional development as a means to transform teachers' perceptions of their roles in promoting global sustainability [21-23]. Additionally, there was a notable shift in how teachers viewed themselves, evolving from seeing themselves merely as "agents of change" to truly embracing that identity. Not only did their knowledge of the SDGs increase during the training, but they also learned how to effectively act as agents of change within their classrooms and communities. This perspective is supported that professional development empowers individuals to become agents of change while implementing sustainable improvements in education and society [24].

CHALLENGES IN SDG INTEGRATION

Despite the positive outcomes of the professional development program, several barriers to integrating SDGs remain. The three most frequently cited challenges include insufficient resources (70%) and an overcrowded curriculum (60%). The study reveals multiple systemic barriers that hinder the effective integration of SDGs into educational practice. Teachers noted difficulty in locating teaching resources related to the SDGs and expressed frustration over a saturated curriculum that restricts the incorporation of additional topics related to global goals [25]. The issue of resource availability has been widely

recognized in educational research, with experts suggesting that a lack of adequate materials and teaching aids obstructs the adoption of global competencies in learning (Amandeep & Singh, 2020). Moreover, the challenge posed by overcrowded curricula exemplifies the limitations of traditional exam-based systems, which often prioritize memorization over problem-solving strategies fundamental to SDG education [26].

Changing the conventional attributes in Teachers

One of the most significant outcomes of this study is the transformation in teachers' mindsets regarding their roles as agents of change. Prior to the Professional Learning program, teachers primarily viewed themselves as providers of content knowledge, feeling disconnected from broader societal issues. However, following the training, there was a clear shift in their self-perception; they began to see themselves as catalysts for change, capable of not only enhancing students' learning but also influencing community attitudes towards sustainability and social justice [27]. This aligns with the concept of "teachers for transformative practice" proposed, which emphasizes the potential of teachers to become change agents when supported through ongoing professional development. The training program equipped teachers with a deeper understanding of the Sustainable Development Goals (SDGs) and provided them with strategies for implementing these goals in the classroom, reinforcing the idea that teachers play a crucial role in achieving global education objectives.

Influence on Student Outcomes

Following the intervention, there was a notable improvement in students' understanding of the SDGs, their participation in related activities, and the connection between these initiatives and

their overall critical thinking skills. This indicates that students' learning is influenced by teachers' professional development in ways that may not be immediately obvious. When teachers incorporate the SDGs into their lessons, students not only become aware of global issues but also feel empowered to seek solutions and contribute to meaningful change. This finding is consistent with international research showing that education supporting the SDGs enhances student engagement and empowerment [28]. The increased student interest in SDG-related projects provides evidence that teachers' efforts to promote global issues encourage students to engage actively and apply these concepts in their daily lives. This supports the notion that educators, as models and facilitators of knowledge in the context of sustainability, can positively influence students' understanding and appreciation of global issues, motivating them to take action within society [29].

This paper outlines policy implications and recommendations based on the following points: While the outcomes of the current study are promising, they highlight the urgent need for systemic transformation within Pakistan's education framework to effectively pursue the Sustainable Development Goals (SDGs). Challenges such as limited funding and overcrowded classrooms indicate that policies must be adjusted to incorporate global competencies into teaching practices. One potential solution is to increase curriculum flexibility, allowing for a broader range of subjects that align with the SDGs. Additionally, providing adequate funding for teachers is essential to ensure high-quality education focused on sustainability [30]. Moreover, the development of effective solutions requires the establishment of continuous learning and training programs. These programs should emphasize the necessary

skills, knowledge, tools, and methods needed to integrate the SDGs into education, which is a critical component of teacher preparation. They must also address the challenges teachers face in resource-limited contexts and provide support to facilitate changes in teaching practices aligned with the 2030 UN Agenda for Sustainable Development.

This study demonstrates that professional development can empower teachers to become change agents responsible for embedding the SDGs into their teaching. However, improving students' L2 writing skills necessitates ongoing training for both current and future educators, along with practical support from educational institutions and policymakers. Equipped with the right knowledge and resources, teachers can play a significant role in fostering change through education for a more sustainable future. The findings of this study offer an optimistic perspective on the role of teachers in driving educational change to achieve sustainable development goals [31]. Most teachers are aware of the concept of Sustainable Development Goals (SDGs), but few possess the necessary competencies to implement them effectively in the classroom. This finding aligns with the study which indicates that while teachers in Pakistan recognize SDGs, they face significant challenges. These challenges include a lack of resources, poorly trained teachers, and large class sizes, which correlate with issues identified in previous studies. It was concluded that only a widespread systemic approach to professional development (PD) and a supportive institutional environment can ensure the effective implementation of SDGs in education.

NATIONAL POLICY FOR INTEGRATING SDGs

It is highlighted the critical absence of a national policy for integrating the

Sustainable Development Goals (SDGs) into the Pakistani educational system. There is an urgent need for general guidelines that facilitate this integration, tailored to the specific needs of various regions, particularly rural areas that contribute significantly to the country's development. Additionally, a rational approach must be developed to create a national strategy for teacher professional development (PD) related to the SDGs [32]. The findings suggest that PD programs should transition from simply disseminating theoretical knowledge to offering practical, context-based strategies for implementing SDG-related instruction. These programs ought to incorporate subject-specific examples, teaching aids, and analyses of case studies relevant to the local schools and teachers. PD should also encourage collaboration among teachers and specialists to enhance its effectiveness. Furthermore, PD must be ongoing and contextualized to reflect the current teaching and learning environment, thereby improving the integration of SDGs [33]. To achieve this, it is essential to establish a set of measurements that aim to enhance teachers' understanding of the SDGs and their incorporation into classroom practices. This includes not only increasing teachers' knowledge of the SDGs but also developing their competencies in delivering these goals within their respective subjects. This is particularly vital for teachers in resource-limited settings, where training opportunities may be scarce [34, 35].

While there is a clear need for teacher professional development focused on integrating SDGs into teaching and learning activities, collaboration with local, national, and international organizations could provide a viable solution for building the necessary capacity. Pakistani teachers, especially those in underprivileged schools, face significant barriers in accessing the

resources and tools required to teach SDGs effectively. Instruction is a critical area of education that must not be compromised by authorities; instead, more teaching resources should be developed to reflect SDG goals, particularly those related to resource provision, such as gadgets and textbooks. Moreover, schools should offer support for incorporating the SDGs into learning environments, such as implementing sustainability projects throughout the school that educators can adopt. This research paves the way for further analysis of effective SDG implementation across specific educational disciplines within the Pakistani educational system. Future studies could explore detailed case studies of how key learning outcomes related to SDGs have been integrated across various learning contexts, especially in rural schools. Additionally, there is a need for longitudinal research designs to assess the effectiveness of professional development programs in preparing teachers to support SDG integration and how these programs, in turn, influence students' perspectives and behaviors towards sustainable development.

CONCLUSION

The findings of this research underscore the crucial role teachers play in facilitating change and integrating the SDGs into classroom practices in Pakistan. There is a clear acknowledgment among teachers of the importance of SDGs, yet they face challenges in translating this awareness into practical application. Key barriers to integration include limited access to resources, inadequate professional development, and difficulties in implementing SDGs at the local School Development Grant level. However, the study reveals a strong demand from teachers for more effective, targeted, and context-based professional development programs to support the incorporation of SDGs into

the teaching-learning process. Additionally, the research emphasizes the need for a systemic approach to addressing these challenges, including institutional support, well-developed PD programs, and policy interventions. Teachers require not only knowledge of SDGs but also an understanding of how to implement these goals in their teaching contexts. By addressing these gaps, teachers can more effectively fulfill their roles in driving change and advancing sustainable development within the education system.

Author(s) Contribution: Resources data and submission, Azka Nasir; review, H. Maryam.

Funding: No funding involved.

Ethical Approval: Not applicable

Conflict of Interest: Nil.

Consent for Publication: All authors approved the manuscript for publication.

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