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The application of distributed leadership in middle school classroom

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This mini-review explores the conceptual framework of distributed leadership and its application in middle school classrooms. Traditional teacher leadership in middle school classrooms has been found to be deficient in meeting the diverse needs of students. Therefore, this article investigates the potential advantages of distributed leadership in addressing the shortcomings of teacher leadership. The article examines the impact of distributed leadership on student achievement, particularly in promoting students' academic performance and ability. Through a critical analysis of existing literature, the review highlights the need to establish effective communication channels, teamwork, and trust in distributed leadership. Furthermore, the article acknowledges the limited empirical research on the effectiveness of distributed leadership in middle school classrooms. Despite this, the article concludes that the adoption of distributed leadership in middle school classrooms can improve student learning outcomes, classroom teaching effectiveness, and school operation efficiency. Overall, this conceptual exploration suggests that distributed leadership has the potential to offer a more effective and inclusive approach to leadership in middle school classrooms.

KEYWORDS

distributed leadership, teaching strategies, student-centered approach, teacher-centered instruction, learning achievement effects

Introduction

Contemporary education models require more than the traditional classroom teaching approach to meet the complex needs of modern students and society (Anderson and Sun, 2017; Yan and Yang, 2021). As a result, classroom teaching reforms have become imperative. Recent studies have indicated that the practice of distributed leadership has a positive correlation with school development (Harris and Spillane, 2008; Harris, 2013). Although distributed leadership in middle school classrooms is a relatively new concept, it has gained considerable attention due to the continuous evolution of modern educational concepts that emphasize comprehensive student development over the mere impartation of knowledge (Leithwood et al., 2007; Diamond and Spillane, 2016; Gurr, 2022, 2023; Striepe et al., 2023).

Scholars argue that the traditional model of small group instruction is inadequate to meet the diverse learning needs of modern students (Harris, 2004; Day and Sammons, 2013; Sunaryo, 2020). Therefore, it is necessary for school leaders and teachers to seek an effective leadership strategy to improve this phenomenon. The significance of distributed leadership in middle school classrooms has been emphasized by Harris (2004), as it plays a crucial role in promoting school performance. In this context, this article aims to assist school

administrators and teachers in enhancing their teaching models through the identified advantages of distributed leadership.

This article will commence by introducing the concept of distributed leadership through the theory of distributed leadership. It will then analyze the shortcomings of traditional teacher leadership in middle school classrooms and compare them with the advantages of distributed leadership. Finally, the article will propose methods for utilizing distributed leadership to improve students' academic performance and abilities, ultimately leading to better classroom teaching outcomes and increased school operational efficiency.

The definition of distributed leadership

Despite the lack of consensus on a widely accepted definition of distributed leadership, it is often characterized by terms such as shared, collaborative, dispersed, and delegated leadership (Spillane, 2005). From a distributed perspective, leadership practices are seen as the result of synergistic interactions between leaders, followers, and their circumstances (Spillane, 2005). This implies that all school personnel collaborate to jointly and cooperatively produce knowledge. Additionally, distributed leadership can be viewed as a decision-making process carried out by personnel at various levels, rather than solely by a single person (Harris, 2009).

Distributed leadership requires everyone in the team to assume certain leadership responsibilities, which can cultivate people's leadership ability and lay a foundation for their future development (Harris, 2008). Harris (2008) believes that by delegating decision-making power to team members, leaders of distributed leadership can empower every employee to participate in leadership, thus improving work efficiency. This view of Harris is supported by MacBeath (2005), who believes that when people have the ability to exercise leadership, they will be more active in the task and can perform better. There is evidence that the wider distribution of leadership has had beneficial effects on schools (Harris, 2011). It can be seen that school leaders can improve the efficiency of school operations through distributed leadership decentralization.

Woods et al. (2004) noted that distributed leadership is primarily characterized by schools' ability to involve different school staff and interested parties in decision-making processes. According to Woods et al. (2004), distributed leadership is a student-centered teaching technique that emphasizes collaboration between instructors and students in classroom instruction, where students play an integral role. Therefore, we believe that distributed leadership can assist students in developing leadership skills, improving their comprehension and mastery of educational topics, and enhancing the effectiveness of classroom instruction.

As a novel leadership style, distributed leadership has gained traction in education, particularly within middle school contexts (Tian et al., 2016). Research indicates that implementing distributed leadership in middle school classrooms is widespread and positively impacts teaching (Harris, 2004; Tian et al., 2016). Traditional classroom teaching, which emphasizes didactic instruction and positions the teacher as the sole authority, often leaves students with limited opportunities for participation and independent thinking (Harris, 2004; Woods et al., 2004;

Tian et al., 2016). In contrast, distributed leadership aims to encourage teachers to create a supportive teaching environment that encourages students to critically analyze things (Harris, 2004; Woods et al., 2004; Tian et al., 2016). With its focus on flat organizational structures and active student participation, distributed leadership can cultivate a sense of involvement and promote independent thinking (Gregory et al., 2009).

Furthermore, distributed leadership is an institutional arrangement that enables the full expression of group members' roles and promotes cooperation and mutual support in achieving team objectives (Harris, 2008). Ghani et al. (2021) found that teamwork fosters communication and mutual assistance among team members, leading to the efficient attainment of collective goals. According to these perspectives, we believe that distributed leadership has the potential to address challenges and accomplish desired goals by facilitating collaboration and communication among team members.

Deficiencies in teacher leadership in middle school classrooms

In middle school classrooms, teacher leadership often emphasizes that students should follow the teacher's instructions and respect the authority of classroom content (Zeichner, 2003; Harris and Muijs, 2004; Wubbels, 2011). Baghoussi (2021) describes the teacher leadership environment as one where teachers explain information from books and students listen to lectures. Teachers typically set rules and tasks, and knowledge is primarily transmitted through lectures (Garrett, 2008).

Several studies have illustrated the potential negative effects of teacher leadership approaches on student learning (Muijs and Harris, 2003; Harris, 2005; Karadağ et al., 2015; Wenner and Campbell, 2017). For example, according to Evertson and Weinstein (2006), the teacher leadership learning environment might weaken students' motivation to learn. In a learning environment led by teachers, students have few opportunities to communicate and interact with others, particularly students who like to communicate with others, leading to low motivation to learn and hindering their learning (Baghoussi, 2021). In this case, teachers should create an active classroom atmosphere, encourage positive student dialogue, create opportunities for each student to speak, and enhance students' enthusiasm.

Teacher leadership approaches could hinder the development of students' creative and critical thinking (Hyvonen, 2011). The teacher leadership approach has been universally criticized for placing students in a passive position, receiving only knowledge, thus limiting their opportunities for creative and critical thinking (Muis, 2004; Webb, 2009). One possible explanation for this phenomenon is that teacher leadership teaching methods lead to a sense of dependence on the teacher, further leading students to believe that the teacher will help them solve all problems without any efforts through themselves. Burkhalter and Shegebayev (2012) clarified that textbooks and teachers' guidance always provide formalistic critical problems, but lack additional critical thinking inspiration and resources. Similarly, a quasi-experiment reported that students in teacher leadership classrooms performed well on simple tasks but poorly on more demanding tasks, suggesting that

traditional teaching styles may limit students' ability to think in complex ways (Milenković and Dimitrijević, 2019).

Teacher leadership approaches may hinder collaboration and communication among students. Research suggests that a teacher leadership learning environment can create a sense of unfamiliarity between students and the teacher (Yip and Raelin, 2012). This sense of unfamiliarity may inhibit students' classroom engagement levels. In a teacher leadership classroom, the teacher leads the class alone, and there is little group discussion and communication among students (Stanulis et al., 2016). In this situation, students' collaborative skills may not be adequately developed.

In summary, teacher leadership in middle school classrooms has negative effects on student learning in different ways. For example, it hinders student engagement and motivation, the development of creative and critical thinking, and teamwork skills. Distributed leadership, on the other hand, can better compensate for these deficiencies in teacher leadership in middle school classrooms. After explaining the negative effects of teacher leadership, the next section will discuss the advantages of distributed leadership in middle school classrooms.

The advantages of distributed leadership in middle school classrooms

Distributed leadership, characterized by shared, collaborative, dispersed, and delegated leadership practices, has gained popularity in education, particularly in middle school contexts (Tian et al., 2016). This section outlines the advantages of distributed leadership in middle school classrooms. Firstly, distributed leadership can stimulate students' enthusiasm and initiative. Students play a central role in distributed leadership, which grants them autonomy to learn and take the initiative in their learning. Harackiewicz and Hulleman (2010) highlighted the importance of interest in improving students' motivation and engagement. Jacobson's (2011) research showed that students under distributed leadership exhibit higher enthusiasm and initiative in learning, focus better, and complete tasks effectively, leading to higher academic performance. Students also have autonomy to choose their own learning content, which results in increased interest in their learning and improved academic performance.

Distributed leadership supports independent learning and self-regulation, which improves academic performance (Anthonysamy et al., 2020). Students who can self-regulate their learning in class can maintain excellent academic performance and make continuous progress (Maclellan, 2014). Personal progress enhances students' self-confidence, and allowing students to experience success in their own progress plays a crucial role in improving their enthusiasm.

Distributed leadership promotes creative and critical thinking. Students can freely exert their creative and critical thinking and improve their problem-solving ability (Gronn, 2008). Bennett et al. (2003) found that distributed leadership improves critical thinking, judgment, and intelligence. Distributed classrooms foster discussion styles, enabling teachers to encourage students to challenge different points of view, leading to increased questioning and acceptance of different perspectives. Students constantly think

and try new methods and strategies to solve problems, which stimulates their creative and critical thinking.

Distributed leadership enhances students' leadership abilities. Distributed leadership mode requires each student to assume certain leadership responsibilities, which cultivates students' leadership and management abilities and lays a foundation for their future development (Dempster and Lizzio, 2007). The new discipline of "student voice" has the potential to make an important contribution to public engagement (Mitra, 2005).

In conclusion, the distributed leadership model can provide more opportunities and platforms for middle school students to improve their abilities and qualities in a team. The traditional teacher leadership classroom environment can hinder students' motivation, critical thinking, and teamwork skills. The new classroom under distributed leadership will promote students' initiative, critical thinking, teamwork, and leadership skills. The next section will discuss how distributed leadership can be used to improve students' academic achievement and ability to improve the effectiveness of classroom teaching and school operations.

Ways to improve the efficiency of school operations using distributed leadership

Distributed leadership requires teamwork, which cultivates students' collaborative ability and enables them to cooperate with others to solve problems. Thoonen et al. (2011) found that when students were engaged in school planning, they were more eager to collaborate. Similarly, Blase (2000) advocates for improving students' cooperative abilities through partnership, peer teaching, inquiry, collegial working groups, and reflection discourse as methods of influencing education. Therefore, distributed leadership builds teamwork by constantly encouraging interaction and mutual support among team members.

Distributed leadership requires better communication and coordination between leaders and members (Harris, 2008). This means that leaders need to establish effective communication channels to ensure that members understand each other. In distributed leadership, effective communication is essential for understanding, respecting, and learning from differences, and developing critical thinking skills (Harris, 2008). For example, disagreements and conflicts may arise in a group, but communication can resolve them. When teachers and students establish close ties and communicate effectively, students become more confident. Research has found that communication skills are strongly correlated with students' academic achievement, with students who are better communicators performing better academically. Conversely, students with poorer communication skills tend to do worse academically and are more likely to drop out of school (Tian et al., 2016). Therefore, good communication skills are important to facilitate student learning.

Distributed leadership requires an environment of trust and support that encourages members to develop their talents (Leithwood et al., 2007). Leaders should give their members enough trust and provide necessary support and help (Fairholm, 1994). This can be achieved by establishing a positive school environment and teacher-student relationships (MacSuga-Gage et al., 2012).

Schools can support student development by establishing a safe, friendly, respectful, and inclusive school environment. DeMatthews et al. (2020) recommend that schools promote the ethos and conditions of a supportive, caring, and inclusive community. By creating a friendly, inclusive, and equal school atmosphere, schools can boost students' confidence, optimism, respect, and sense of value, and promote communication and interaction among students.

In summary, distributed leadership can improve students' academic performance and ability, as well as school efficiency and quality. Distributed leadership also strengthens school team cohesion and facilitates the collaborative operation of the education system.

Conclusion

This mini-review has explored the benefits of implementing distributed leadership in middle school classrooms. In today's educational environment, traditional teacher leadership approaches may not fully meet the diverse needs of students. The distributed leadership approach, with its emphasis on collaboration and mutual support, can address the deficiencies in teacher leadership and has many advantages. Teachers under distributed leadership need to have not only strong educational and teaching skills but also the ability to participate in school management and decision-making. In middle school classrooms, teachers can adopt different distributed leadership methods, such as organizing group cooperation and encouraging independent study, to meet the diverse developmental needs of students, improve their academic performance and abilities, and enhance the effectiveness of classroom teaching and school operation.

Furthermore, distributed leadership is an important leadership model for organizations to meet internal and external uncertainties and to stimulate the potential of leaders with a unique growth logic. The development path based on distributed leadership theory is a gradual and dynamic process, from concept to

practice. The school should continuously optimize all aspects of the organizational structure, institutional system, and learning community construction to build a platform for the development of leaders' individual potential. In this way, the school's management effectiveness can be continuously improved, and sustainable development can be achieved for teachers, students, and the school.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

- Anderson, M. H., and Sun, P. Y. (2017). Reviewing leadership styles: Overlaps and the need for a new 'full-range' theory. *Int. J. Manag. Rev.* 19, 76–96. doi: 10.1111/ijmr.12082
- Anthonsamy, L., Koo, A. C., and Hew, S. H. (2020). Self-regulated learning strategies and non-academic outcomes in higher education blended learning environments: A one decade review. *Educ. Inform. Technol.* 25, 3677–3704.
- Baghoussi, M. (2021). Teacher-centered approach prevalence in Algerian secondary-school English as a foreign language (EFL) classes: The case of English teachers and learners in Mostaganem district. *Arab World Eng. J.* 12, 268–278. doi: 10.24093/awej/vol12no2.18
- Bennett, N., Wise, C., Woods, P. A., and Harvey, J. A. (2003). *Distributed leadership: A review of literature National College for School Leadership*. Milton Keynes: The Open University.
- Blase, J. (2000). Effective instructional leadership: Teachers' perspectives on how principals promote teaching and learning in schools. *J. Educ. Admin.* 38, 130–141. doi: 10.1108/09578230010320082
- Burkhalter, N., and Shegebayev, M. R. (2012). Critical thinking as culture: Teaching post-Soviet teachers in Kazakhstan. *Int. Rev. Educ.* 58, 55–72. doi: 10.1007/s11159-012-9285-5
- Day, C., and Sammons, P. (2013). *Successful leadership: A review of the international literature*. Education Trust. Oxford: University of Oxford.
- DeMatthews, D., Billingsley, B., McLeskey, J., and Sharma, U. (2020). Principal leadership for students with disabilities in effective inclusive schools. *J. Educ. Admin.* 58, 539–554. doi: 10.1108/jea-10-2019-0177
- Dempster, N., and Lizzio, A. (2007). Student leadership: Necessary research. *Aust. J. Educ.* 51, 276–285. doi: 10.1177/000494410705100305
- Diamond, J., and Spillane, J. (2016). School leadership and management from a distributed perspective: A 2016 retrospective and prospective. *Manag. Educ.* 30, 147–154. doi: 10.1177/0892020616665938
- Everton, C. M., and Weinstein, C. S. (2006). Classroom management as a field of inquiry. *Handb. Classroom Manag.* 3:16. doi: 10.4324/9780203874783.ch1
- Fairholm, G. W. (1994). *Leadership and The Culture of Trust*. Westport: Greenwood Publishing Group, doi: 10.1007/978-0-387-84902-7_6
- Garrett, T. (2008). Student-centered and teacher-centered classroom management: A case study of three elementary teachers. *J. Classroom Interact.* 43, 34–47.
- Ghani, A. S., Rahim, A. F., Yusoff, M. S., and Hadie, S. N. (2021). Effective learning behavior in problem-based learning: A scoping review. *Med. Sci. Educ.* 31, 1199–1211. doi: 10.1007/s40670-021-01292-0

- Gregory, K., Steelman, J., and Caverly, D. C. (2009). Techtalk: Digital storytelling and developmental education. *J. Dev. Educ.* 33, 42–43.
- Gronn, P. (2008). The future of distributed leadership. *J. Educ. Admin.* 46, 141–158. doi: 10.1108/09578230810863235
- Gurr, D. (2022). *Leadership of Schools in the Future*. New York, NY: Nova Publishers.
- Gurr, D. (2023). “A review of Research on Middle Leaders in Schools,” in *International Encyclopedia of Education*, 4th Edn, eds R. Tierney, F. Rizvi, K. Ercikan, and G. Smith (London, UK: Elsevier), 115–122. doi: 10.1016/B978-0-12-818630-5.05041-7
- Harackiewicz, J. M., and Hulleman, C. S. (2010). The importance of interest: The role of achievement goals and task values in promoting the development of interest. *Soc. Pers. Psychol. Compass* 4, 42–52. doi: 10.1111/j.1751-9004.2009.00207.x
- Harris, A. (2004). Distributed leadership and school improvement. *Educ. Manag. Admin. Leadersh.* 32, 11–24. doi: 10.1177/1741143204039297
- Harris, A. (2005). Teacher leadership: More than just a feel-good factor? *Leadersh. Policy Sch.* 4, 201–219. doi: 10.1080/15700760500244777
- Harris, A. (2008). Distributed leadership: According to the evidence. *J. Educ. Admin.* 46, 172–188. doi: 10.1108/09578230810863253
- Harris, A. (2009). Coda. *Distrib. Leadersh.* 7, 241–243. doi: 10.1007/978-1-4020-9737-9_13
- Harris, A. (2011). Distributed leadership: implications for the role of the principal. *J. Manag. Dev.* 31, 7–17. doi: 10.1108/02621711211190961
- Harris, A. (2013). Distributed leadership. *Educ. Manag. Admin. Leadersh.* 41, 545–554. doi: 10.1177/1741143213497635
- Harris, A., and Muijs, D. (2004). *Improving schools through teacher leadership*. Maidenhead: Open University Press.
- Harris, A., and Spillane, J. (2008). Distributed leadership through the looking glass. *Manag. Educ.* 22, 31–34. doi: 10.1177/0892020607085623
- Hyvonen, P. T. (2011). Play in the school context? The perspectives of Finnish teachers. *Aust. J. Teach. Educ.* 36, 65–83. doi: 10.14221/ajte.2011v36n8.5
- Jacobson, S. (2011). Leadership effects on student achievement and sustained school success. *Int. J. Educ. Manag.* 25, 33–44. doi: 10.1108/09513541111100107
- Karadağ, E., Bektaş, F., Çoğaltay, N., and Yalçın, M. (2015). The effect of educational leadership on students' achievement: A meta-analysis study. *Asia Pac. Educ. Rev.* 16, 79–93. doi: 10.1007/s12564-015-9357-x
- Leithwood, K., Mascall, B., Strauss, T., Sacks, R., Memon, N., and Yashkina, A. (2007). Distributing leadership to make schools smarter: Taking the ego out of the system. *Leadersh. Policy Sch.* 6, 37–67. doi: 10.1080/15700760601091267
- MacBeath, J. (2005). Leadership as distributed: a matter of practice. *Sch. Leadersh. Manag.* 25, 349–366. doi: 10.1080/13634230500197165
- Maclellan, E. (2014). How might teachers enable learner self-confidence? A review study. *Educ. Rev.* 66, 59–74. doi: 10.1080/00131911.2013.768601
- MacSuga-Gage, A. S., Simonsen, B., and Briere, D. E. (2012). Effective teaching practices: Effective teaching practices that promote a positive classroom environment. *Beyond Behav.* 22, 14–22. doi: 10.1177/10742956120220104
- Milenković, A., and Dimitrijević, S. (2019). “Advantages and disadvantages of heuristic teaching in relation to the traditional teaching—the case of the parallelogram area,” in *Scientific Conference “Research in Mathematics Education” Proceedings*, (Belgrade), 74–141.
- Mitra, D. L. (2005). Adults advising youth: Leading while getting out of the way. *Educ. Admin. Q.* 41, 520–553. doi: 10.1177/0013161X04269620
- Muijs, D., and Harris, A. (2003). Teacher leadership—improvement through empowerment? An overview of the literature. *Educ. Manag. Admin.* 31, 437–448. doi: 10.1177/0263211x030314007
- Muis, K. R. (2004). Personal epistemology and mathematics: A critical review and synthesis of research. *Rev. Educ. Res.* 74, 317–377. doi: 10.3102/00346543074003317
- Spillane, J. P. (2005). Distributed leadership. *Educ. Forum* 69, 143–150. doi: 10.1080/00131720508984678
- Stanulis, R. N., Cooper, K. S., Dear, B., Johnston, A. M., and Richard-Todd, R. R. (2016). Teacher-led reforms have a big advantage—teachers. *Phi Delta Kappan* 97, 53–57. doi: 10.1177/00317217166641650
- Striepe, S., Thompson, P., Robertson, S., Devi, M., Gurr, G., Longmuir, F., et al. (2023). Responsive, adaptive, and future-centred leadership in response to crisis: findings from Australia, Fiji, and New Zealand. *Sch. Leadersh. Manag.* doi: 10.1080/13632434.2023.2171005
- Sunaryo, Y. S. (2020). Academic supervision of school principals and teacher performance: A literature review. *Int. J. Pedagog. Soc. Stud.* 5, 17–34. doi: 10.17509/ijpsos.v5i2.29094
- Thoonen, E. E. J., Slegers, P. J. C., Oort, F. J., Peetsma, T. T. D., and Geijsel, F. P. (2011). How to improve teaching practices: The role of teacher motivation, organizational factors, and leadership practices. *Educ. Admin. Q.* 47, 496–536. doi: 10.1177/0013161X11400185
- Tian, M., Risku, M., and Collin, K. (2016). A meta-analysis of distributed leadership from 2002 to 2013: Theory development, empirical evidence and future research focus. *Educ. Manag. Admin. Leadersh.* 44, 146–164. doi: 10.1177/174114321455857
- Webb, N. M. (2009). The teacher's role in promoting collaborative dialogue in the classroom. *Br. J. Educ. Psychol.* 79, 1–28. doi: 10.1348/000709908X380772
- Wenner, J. A., and Campbell, T. (2017). The theoretical and empirical basis of teacher leadership: A review of the literature. *Rev. Educ. Res.* 87, 134–171. doi: 10.3102/0034654316653478
- Woods, P. A., Bennett, N., Harvey, J. A., and Wise, C. (2004). Variabilities and dualities in distributed leadership. *Educ. Manag. Adm. Leadersh.* 32, 439–457. doi: 10.1177/1741143204046497
- Wubbels, T. (2011). An international perspective on classroom management: What should prospective teachers learn? *Teach. Educ.* 22, 113–131. doi: 10.1080/10476210.2011.567838
- Yan, S., and Yang, Y. (2021). Education informatization 2.0 in China: Motivation, framework, and vision. *Rev. Educ.* 4, 410–428. doi: 10.1177/2096531120944929
- Yip, J., and Raelin, J. A. (2012). Threshold concepts and modalities for teaching leadership practice. *Manag. Learn.* 43, 333–354. doi: 10.1177/1350507611422476
- Zeichner, K. M. (2003). Teacher research as professional development for P–12 educators in the USA. *Educ. Action Res.* 11, 301–326. doi: 10.1080/09650790300200211