## **Book Review**

Klar, H. W., & Huggins, K. S. (2020). Developing Rural School Leaders: Building Capacity Through Transformative Leadership Coaching. Routledge.

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2020).

How do we conceptualize the development of rural educational leaders? How do we ensure students living in rural America have access to world-class instruction in a complex and rapidly shifting world? What do we need to do differently to provide transformative educational experiences for rural teachers, students, and families? In Developing Rural School Leaders: Building Capacity Through Transformative Leadership Coaching, Klar and Huggins (2020) merge the best of theory and practice to create a framework for rural educational leadership development for both educational leadership preparation programs and for practicing rural school leaders. Their book provides a comprehensive educational leadership model with contextual applications, which helps to close the theory-practice gap that often plagues education.

Developing Rural School Leaders offers a fascinating analysis of a socio-spatial framework, one that acknowledges shifts in population patterns, economic activity, and connections to space and place, for rural school context and identity. Throughout the book, the authors challenge urbancentric archetypes of education that view small rural schools as under-resourced and therefore lacking value, presenting important insights into the asset-based approaches rural leaders can incorporate in their schools. Considering capacity-building efforts to drive continuous school improvement, Klar and Huggins provide a contextually relevant approach to rural school leadership development. Through training, coaching, professional learning communities, and research-practice partnerships (RPPs), the authors develop a unique model for

the wisdom of stakeholders.

Klar and Huggins provide an eight-chapter, three-part analysis for the consideration of those interested in better supporting rural school leaders, specifically rural educational leadership preparation programs and practicing rural school leaders. The first part is a review of rural school leadership development literature, which explores the rural context in the United States, the many hats rural educational leaders wear in their duties, the professional development opportunities available for rural school leaders, and the development of RPPs to better support rural leaders across the country. The second part is a collection of case

studies that detail the development of three rural school

leaders. These studies highlight the importance of data-

informed decision making, leveraging teacher leadership

to improve the culture of pedagogical outcomes, and developing a critical mass of teacher leaders within rural

school communities. The last part of the book provides a

brief synopsis of how transformative coaching might propel

rural school leadership development through engagement in

a continuous school improvement cycle (Klar & Huggins,

developing rural school leaders by focusing on behaviors,

beliefs, and ways of being to leverage action and address

problems of practice that lead to increased outcomes for

rural communities: academic engagement, social-emotional

development and support, and creating a culture that honors

One of the great tensions that the book unpacks—appropriately so—is the theme of attempting to balance an asset-based approach in rural education while also acknowledging the very real challenges rural schools and rural educators face. Throughout the book, Klar and Huggins address the serious inequities rural schools must be able to address while also recognizing, honoring, and cultivating strengths and assets that benefit rural schools. In this way, the authors avoid the pitfall of being too asset oriented, grounding their work instead in addressing the challenges

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of rural education in the United States while simultaneously critiquing the inequitable structures many rural schools face in an urbancentric education system.

The first chapter provides an important foundation, perhaps for readers less familiar with rural education contexts, for how rural schools are classified, including but not limited to descriptively, economically, and spatially. The use of National Center for Education Statistics (NCES) and U.S. Census Bureau classifications allows the authors to address factors that influence rural schools and communities (Thier et al., 2021), namely political context (one-sizefits-all curricula and funding policies that are typically considered detrimental to rural communities), economic context (socio-spatial variables related to lack of access to jobs and resources usually centered in urban cores and service hubs), demographic context (shifting populations patterns based on globalization and outmigration of educated and skilled workers), and socio-cultural contexts (misconceptions of rural areas, tightknit communities, and the very real pressures young rural people feel to strive for aspirations to leave). These four factors lead to professional and personal challenges, such as the negative impact of inadequate resources on instructional programs, high teacher and principal turnover, heavy workloads for principals, professional and personal isolation, and lack of work-life balance (DeFeo & Tran, 2019; Oyen & Schweinle, 2021; Pendola & Fuller, 2018). As mentioned earlier, however, the authors rightly point out the Janusian thinking that rural characteristics or rural communities can also serve as assets. Tightknit rural networks are highly capable of fostering trust, leveraging communication, and using social capital to drive educational outcomes through various school-community partnerships (Zuckerman, 2019). In this chapter, the authors nicely set the stage to allow the reader to fully understand the contextual landscape of rural school leadership.

The value of what Klar and Huggins propose in their book is not tied to a radical new theory about rural educational leadership development, but rather in their sensical approach that is so often lacking in academic literature. In Chapter 2 they answer a very practically grounded question of "What should rural school leaders be developed to do?" In short, the answer is they need to learn to be capacity builders, specifically focusing on continuous development of their own leadership capacity, the ability to engage in interpersonal development to mobilize others, the organizational development of a school building to engage in continuous school improvement, and investment in the capacity of the community to connect rural stakeholders and community groups more deeply to the school system. Given the nature of rural school systems, rural school leaders must encourage in other staff members the ability to help lead through distributive leadership efforts that target instructional and organizational improvement (Wallin et al., 2019; Wieczorek & Manard, 2018; Zuckerman et al., 2018). By focusing on developing the capacity of others, as well as the needs of the community, rural school leaders can implement continuous school improvement efforts in contextually relevant ways. Especially in rural communities, it is incredibly important for school leaders to interweave their personal backgrounds into their professional work, leverage professional knowledge about teaching and learning to empower others to help lead, purposefully guide a shared vision of the work, and harness the power of familial relationships to honor the complexity and history of rural spaces (Harmon, 2018; Schmitt-Wilson et al., 2018).

The third chapter feels as though it is one of the less developed sections of the book, particularly as it relates to professional development for rural school leaders and why or how rural school leaders should be supported to grow as professionals within a rural context. As noted by Rowland (2017), there is a need across rural America to develop effective rural school leaders to ensure that high-quality principals are equitably distributed as well as to reduce turnover in rural schools. Klar and Huggins (2020) attempt to make the argument that retaining and supporting ongoing rural school principal growth can be accomplished through rural leadership professional development networks that address the unique challenges of rural school principals, especially when "leaders hired with little administrative experience can find the challenges of wearing many hats and working in professional isolation while balancing school and community demands to be particularly challenging" (p. 48). However, I found myself wanting to read more about how these professional development opportunities could be contextually applied in rural settings in ways in which they have not been previously. As the authors rightly point out, focusing on adult learning, increasing rural-relevant professional learning opportunities, and developing leadership coaching opportunities within a rural paradigm are all critical to rural school leadership development (Orphan & McClure, 2019). However, access to RPPs that are dedicated to making a difference in rural schools that honor and value rurality (Wargo et al., 2021) is an opportunity that very few rural schools and communities have at their disposal. As such, there is a great need to expand these opportunities throughout rural America, and highlighting the benefits of a rural-serving RPP is what helps distinguish the contributions made in this book.

In the fourth chapter Klar and Huggins (2020) describe how a three-year RPP process led to the development of the Leadership Learning Community (LLC), a "two-year, cross-district, job-embedded leadership development initiative that emphasized leadership coaching and learning in professional communities" (p. 67). Perhaps the most powerful chapter for the book's primary audience—instructors in rural educational leadership preparation

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programs and/or practicing rural school leaders—to consider in their support of rural education development is how Klar and Huggins (2020) detail the LLC selection process, which includes a commitment to the action research cycle, instructional leadership, attention to school culture, and alignment of beliefs and behaviors between leaders and those coaching leadership (Davidson & Butcher, 2019; Hvidston & McKim, 2019). It is through the creation and ongoing development of leadership laboratories like the LLC that rural leaders are able to value place, people, and the purpose of rural schools in order to facilitate increased student outcomes through personalized leadership that leverages professional knowledge. The authors point out the importance of the interpersonal connections created through the LLC, specifically the creation of a safe space that uses norms and values to drive collective learning, reflection, and connection that lead to more sustainable outcomes for rural school stakeholders and communities (Reading et al., 2019; Rooks, 2018). As noted throughout the book, it is imperative to create rural education communities that allow educators, students, and stakeholders alike to wrestle with the challenges of rural education systems and collaboratively envision what a redesigned and reconstructed system might look like.

The second part of the book provides case studies of three LLC leaders. These case studies describe the "transformative leadership coaching model and the various activities intended to support both coaches and leaders in learning to utilize action research to advance continuous school improvement efforts" (Klar & Huggins, 2020, p. 86). Using a framework that allows the reader to understand the nuances of each case study, the authors provide leadership context, coach background, identification of and focus on a problem of practice, the process of engaging in action research, data analysis to inform school improvement, and next steps for leadership development. Much of the framing for this type of leadership development appears to be based on the reconceptualization of what it means to be a scholarpractitioner and is grounded in the work of the Carnegie Project for the Educational Doctorate (Latta & Wunder, 2012; Perry & Carlson, 2013). This approach is particularly useful to rural leadership preparation programs to help close the theory-practice gap on how to help develop rural school leaders, but it is also useful to practitioners in the field who might want to use the authors' work as a book study to improve leadership in situ (Buss, 2018; Hesbol et al., 2020). The focus of all the cases therefore contributes to the goal of cultivating the use of the action research cycle to drive continuous school improvement and leadership development efforts for rural school leaders (Glanz, 2016).

Chapter 5 focuses on enhancing the use of data to drive instructional improvement, specifically the ability of Isabella, the assistant principal of an elementary school in the case, to grow as a facilitator, communicator, and instructional leader who could help drive improvements to the delivery of the curriculum. Chapter 6 details a case in which the instruction coach of an elementary school, Charlotte, focuses on developing teacher leadership to drive ongoing school improvement efforts, particularly how it translates to reinforcement of motivation and the importance of recognizing the efforts of teacher leadership. Chapter 7 describes how Hunter, a high school principal, wanted to increase teacher-led professional development opportunities and how this activity translated into increased enrichment and remediation opportunities for students. The three cases offer important examples of what rural school leadership development might entail if rural schools can partner with RPPs as well as leverage additional resources to help restructure educational organizations.

In the eighth and final chapter, Klar and Huggins (2020) discuss opportunities as well as challenges for rural school leadership development. While the authors do a nice job acknowledging the opportunities—including leveraging the strength of an RPP, the creation of a rural network through the LLC, and the use of adult learning theory to increase leadership and organizational capacity—there seems to be something of a lack of recognition of some of the challenges to rural school leadership development. In large part this gap is likely due to the attempt to move away from deficit thinking about the performance of rural schools (Azano & Biddle, 2019; Cervone, 2018; Howley et al., 2018), which rural scholars and practitioners will certainly understand. Books on rural leadership development could benefit, however, from honoring more of the real challenges for rural stakeholders (Klocko & Justis, 2019; Li, 2019), both in PK-12 and higher education, which should include conversations about paradigm shifts from outdated thinking about what school is and instead focus on what school could be (Comber, 2015; Reynolds, 2017). That said, addressing these challenges needs to include engagement with community members to consider how this process might work in practice. The tension within rural communities has always been between maintaining history and tradition and giving young people a path forward so they have the ability or option to stay if they so choose (Moffa & McHenry-Sorber, 2018; Schulte, 2018). Rural educational leaders will need to engage in this type of community building as well.

In general, this work is refreshing, insightful, and needed. One of the great strengths of the book is the artful melding of theories in the first four chapters. For example, Figure 1.1 (p. 7), Figure 2.3 (p. 39), and Figure 4.2 (p. 82) all provide important heuristic devices to understand more deeply how to develop contextually relevant rural school leaders. Specifically, Figure 1.1 provides a framework for defining the contextual influences of rural schools, Figure 2.3 provides a paradigm for more deeply understanding the

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role of schools in a rural community context, and Figure 4.2 defines contextually relevant rural school leadership development. Klar and Huggins (2020) provide timely insights about the important and yet underdeveloped science and art of rural school leadership development, particularly as it relates to the place, people, and purpose that rural educational systems serve, as well as demographics and socio-cultural factors (McHenry-Sorber & Budge, 2018; Williams & Grooms, 2015). Any university system or RPP with a rural focus should look closely at Klar and Huggan's book as a resource, not only for practitioners but also for instructors and coaches as they frame their support structures.

Another related strength of the book is how it focuses on the intersection of adult learning (Drago-Severson et al., 2013; Mezirow, 2000) and vulnerability in educational leadership (Ackerman & Maslin-Ostrowski, 2002). As such the authors provide a great foundation for rural school leadership development as it relates to acknowledging personal backgrounds, honoring familial relationships, and valuing place and complexity of rural spaces (Hansen, 2018). With their focus on the development of rural leaders, the authors' contributions can help in the creation of support structures that are more relevant for rural school leaders.

Retaining and supporting ongoing rural school principal growth can be accomplished through rural leadership professional networks that foster the development of a socio-spatial framework for rural school leadership using context and identity. As addressed by the authors, the unique challenges of rural school principals can be overwhelming at times, especially when "leaders hired with little administrative experience can find the challenges of wearing many hats and working in professional isolation while balancing school and community demands to be particularly challenging" (Klar & Huggins, 2020, p. 48). However, moving away from urbancentric archetypes that contribute to defining rural schools as deficient is a crucial step, as are shifting focus on rural school leadership development toward adult learning, increasing ruralrelevant professional learning opportunities, and developing leadership coaching opportunities within a rural paradigm (Glover et al., 2016). That said, what helps distinguish the contributions made in this book is access to a RPP that is dedicated to making a difference in rural schools and that honors and values rurality, particularly how rural school leaders can lead continuous school improvement efforts in contextually relevant ways if given the right resources and supports, such as a rural-serving RPP. For rural scholars and practitioners alike, this book provides an incredible framework to support the work of reimagining rural education in the 21st century.

## References

- Ackerman, R. H., & Maslin-Ostrowski, P. (2002). The wounded leader: How real leadership emerges in times of crisis. Jossey-Bass.
- Azano, A. P., & Biddle, C. (2019). Disrupting dichotomous traps and rethinking problem formation for rural education. *The Rural Educator*, 40(2), 4–11. <a href="https://doi.org/10.35608/ruraled.v40i2.845">https://doi.org/10.35608/ruraled.v40i2.845</a>
- Buss, R. R. (2018). Using action research as a signature pedagogy to develop EdD students' inquiry as practice abilities. *Impacting Education*, 3(1). <a href="https://doi.org/10.5195/ie.2018.46">https://doi.org/10.5195/ie.2018.46</a>
- Cervone, J. (2018). Imagining the rural future: A response to Howley, Clifton & Howley. *Journal of Research in Rural Education*, 33(7), 1–3. <a href="https://jrre.psu.edu/sites/default/files/2019-08/33-7.pdf">https://jrre.psu.edu/sites/default/files/2019-08/33-7.pdf</a>
- Comber, B. (2015). *Literacy, place, and pedagogies of possibility*. Routledge.
- Davidson, S. L., & Butcher, J. (2019). Rural superintendents' experiences with empowerment and alignment to vision in the application of principle-Centered leadership. *The Rural Educator*, 40(1), 63–72. https://doi.org/10.35608/ruraled.v40i1.533
- DeFeo, D. J., & Tran, T. C. (2019). Recruiting, hiring, and training Alaska's rural teachers: How superintendents practice place-conscious leadership. *Journal of Research in Rural Education*, 35(2), 1–17. <a href="https://jrre.psu.edu/sites/default/files/2019-06/35-2.pdf">https://jrre.psu.edu/sites/default/files/2019-06/35-2.pdf</a>
- Drago-Severson, E., Blum-DeStefano, J., & Asghar, A. (2013). Learning for leadership: Developmental strategies for building capacity in our schools. Corwin.
- Glanz, J. (2016). Action research by practitioners: A case study of a high school's attempt to create transformational change. *Journal of Practitioner Research*, *I*(1), 1–23. <a href="https://doi.org/10.5038/2379-9951.1.1.1027">https://doi.org/10.5038/2379-9951.1.1.1027</a>
- Glover, T. A., Nugent, G. C., Chumney, F. L., Ihlo, T., Shapiro, E. S., Guard, K., Koziol, N., & Bovaird, J. (2016). Investigating rural teachers' professional development, instructional knowledge, and classroom practice. *Journal of Research in Rural Education*, 31(3), 1–16. <a href="https://jrre.psu.edu/sites/default/files/2019-08/31-3.pdf">https://jrre.psu.edu/sites/default/files/2019-08/31-3.pdf</a>
- Hansen, C. (2018). Why rural principals leave. *The Rural Educator*, 39(1), 41–53. <a href="https://doi.org/10.35608/ruraled.v39i1.214">https://doi.org/10.35608/ruraled.v39i1.214</a>
- Harmon, H. L. (2018). Collaboration: A partnership solution in rural education. *The Rural Educator*, *38*(1), 1–5. <a href="https://doi.org/10.35608/ruraled.v38i1.230">https://doi.org/10.35608/ruraled.v38i1.230</a>
- Hesbol, K. A., Bartee, J. S., & Amiri, F. (2020). Activism in practice: The influence of a rural school leader's

BOOK REVIEW

- beliefs and practices in disrupting historical patterns of underachievement in traditionally marginalized students. *Impacting Education*, *5*(2), 33–43. <a href="https://doi.org/10.5195/ie.2020.134">https://doi.org/10.5195/ie.2020.134</a>
- Hvidston, D., & McKim, C. A. (2019). Superintendents' perceptions regarding the supervision and evaluation of principals in a rural state. *The Rural Educator*, 40(3), 14–22. https://doi.org/10.35608/ruraled.v40i3.779
- Howley, C. B., Clifton, J., & Howley, A. (2018). Equality, history and an end to whiteness. *Journal of Research in Rural Education*, *33*(8), 1–3. <a href="https://jrre.psu.edu/sites/default/files/2019-08/33-8.pdf">https://jrre.psu.edu/sites/default/files/2019-08/33-8.pdf</a>
- Klar, H. W., & Huggins, K. S. (2020). Developing rural school leaders: Building capacity through transformative leadership coaching. Routledge.
- Klocko, B., & Justis, R. J. (2019). Leadership challenges of the rural school principal. *The Rural Educator*, 40(3), 23–34. https://doi.org/10.35608/ruraled.v40i3.571
- Latta, M. M., & Wunder, S. W. (2012). Placing practitioner knowledge at the center of teacher education: Rethinking the policies and practices of the educational doctorate. Information Age.
- Li, X. (2019). Challenging both rural advantage and disadvantage narratives: The effects of family factors on American student college expectations in the early 2010s. *Journal of Research in Rural Education*, 35(5), 1–16. <a href="https://jrre.psu.edu/sites/default/files/2019-07/35-5">https://jrre.psu.edu/sites/default/files/2019-07/35-5</a> 0.pdf
- McHenry-Sorber, E., & Budge, K. (2018). Revisiting the rural superintendency: Rethinking guiding theories for contemporary practice. *Journal of Research in Rural Education*, 33(3), 1–15. <a href="https://jrre.psu.edu/sites/default/files/2019-08/33-3.pdf">https://jrre.psu.edu/sites/default/files/2019-08/33-3.pdf</a>
- Mezirow, J. (2000). Learning to think like an adult. Core concepts of transformation theory. In J. Mezirow & Associates (Eds.), *Learning as transformation: Critical perspectives on a theory in progress* (pp. 3–34). Jossey-Bass.
- Moffa, E., & McHenry-Sorber, E. (2018). Learning to be rural: Lessons about being rural in teacher education programs. *The Rural Educator*, 39(1), 26–40. <a href="https://doi.org/10.35608/ruraled.v39i1.213">https://doi.org/10.35608/ruraled.v39i1.213</a>
- Oyen, K., & Schweinle, A. (2021). Addressing teacher shortages in rural America: What factors help new teachers apply to teach in rural settings? *The Rural Educator*, 41(3), 12–25. <a href="https://doi.org/10.35608/ruraled.v41i3.923">https://doi.org/10.35608/ruraled.v41i3.923</a>
- Orphan, C. M., & McClure, K. R. (2019). An anchor for the region: Examining a regional comprehensive university's efforts to serve its rural, Appalachian community. *Journal of Research in Rural Education*, 35(9), 1–19. <a href="https://jrre.psu.edu/sites/default/files/2019-12/35-9.pdf">https://jrre.psu.edu/sites/default/files/2019-12/35-9.pdf</a>

Pendola, A., & Fuller, E. J. (2018). Principal stability and the rural divide. In E. McHenry-Sorber & D. Hall (Eds.), The diversity of rural educational leadership [Special issue]. *Journal of Research in Rural Education*, 34(1), 1–20. <a href="https://jrre.psu.edu/sites/default/files/2019-06/34-1.pdf">https://jrre.psu.edu/sites/default/files/2019-06/34-1.pdf</a>

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- Perry, J. A., & Carlson, D. L. (2013). In their own words: A journey to the stewardship of the practice in education. Information Age.
- Reading, C., Khupe, C., Redford, M., Wallin, D., Versland, T., Taylor, N., & Hampton, P. (2019). Educating for sustainability in remote locations. *The Rural Educator*, 40(2), 43–53. <a href="https://doi.org/10.35608/ruraled.v40i2.849">https://doi.org/10.35608/ruraled.v40i2.849</a>
- Reynolds, W. M. (2017). Forgotten places: Critical studies in rural education. Peter Lang.
- Rooks, D. (2018). The unintended consequences of cohorts: How social relationships can influence the retention of rural teachers recruited by cohort-based alternative pathway programs. *Journal of Research in Rural Education*, 33(9), 1–22. <a href="https://doi.org/10.18113/P8JRRE3309">https://doi.org/10.18113/P8JRRE3309</a>
- Rowland, C. (2017). *Principal professional development: New opportunities for a renewed state focus*. American Institutes for Research, Education Policy Center.
- Schmitt-Wilson, S., Downey, J. A., & Beck, A. E. (2018). Rural educational attainment: The importance of context. *Journal of Research in Rural Education*, 33(1), 1–14. <a href="https://jrre.psu.edu/sites/default/files/2019-08/33-1.pdf">https://jrre.psu.edu/sites/default/files/2019-08/33-1.pdf</a>
- Schulte, A. K. (2018). Connecting to students through place. *The Rural Educator*, *39*(2), 13–20. <a href="https://doi.org/10.35608/ruraled.v39i2.201">https://doi.org/10.35608/ruraled.v39i2.201</a>
- Thier, M., Longhurst, J. M., Grant, P. D., & Hocking, J. E. (2021). Research deserts: A systematic mapping review of U.S. rural education definitions and geographies. *Journal of Research in Rural Education*, 37(2), 1–24. <a href="https://doi.org/10.26209/jrre3702">https://doi.org/10.26209/jrre3702</a>
- Wallin, D., Newton, P., Jutras, M., & Adilman, J. (2019). "I'm not where I want to be": Teaching principals' instructional leadership practices. *The Rural Educator*, 40(2), 23–32. <a href="https://doi.org/10.35608/ruraled.v40i2.777">https://doi.org/10.35608/ruraled.v40i2.777</a>
- Wargo, E., Budge, K., Carr-Chellman D., & Canfield-Davis, K. (2021). Leadership for rural school district improvement: The case of one statewide research practice partnership. *Journal of Research in Rural Education*, *37*(1), 1–18. <a href="https://doi.org/10.26209/jrre3701">https://doi.org/10.26209/jrre3701</a>
- Wieczorek, D., & Manard, C. (2018). Instructional leadership challenges and practices of novice principals in rural schools. In E. McHenry-Sorber & D. Hall (Eds.), The diversity of rural educational leadership [Special issue].

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Journal of Research in Rural Education, 34(2), 1–21. https://jrre.psu.edu/sites/default/files/2019-06/34-2\_0. pdf

- Williams, S. M., & Grooms, A. A. (Eds.). (2015). Educational opportunity in rural contexts: The politics of place. Information Age.
- Zuckerman, S. J. (2019). Making sense of place: A case study of sensemaking in a rural school-community partnership. *Journal of Research in Rural Education*, 35(6), 1–18. <a href="https://jrre.psu.edu/sites/default/files/2019-07/35-6">https://jrre.psu.edu/sites/default/files/2019-07/35-6</a> 0.pdf
- Zuckerman, S. J., Campbell Wilcox, K., Schiller, K. S., & Durand, F. T. (2018). Absorptive capacity in rural schools: Bending not breaking during disruptive innovation implementation. In E. McHenry-Sorber & D. Hall (Eds.), The diversity of rural educational leadership [Special issue]. *Journal of Research in Rural Education*, 34(3), 1–27. https://jrre.psu.edu/sites/default/files/2019-06/34-3 0.pdf