Virtual Mentoring and Coaching with Real-Time Feedback (VMC-RTF)

Supporting Teachers' Instructional Growth Through Instant Online Feedback

Andrea McMurray, M.Ed., Henan Zhang, Ph.D., Rafael Lara-Alecio, Ph.D., Beverly J. Irby, Ph.D., Fuhui Tong, Ph.D., Kara L. Sutton-Jones, Ph.D., & Cindy Guerrero, Ph.D.

Virtual mentoring and coaching (VMC) has emerged as a powerful, flexible, and scalable approach to supporting educator development across diverse contexts, particularly in bilingual/English as a second language (ESL) education, leadership preparation, and teacher residencies. As technology-enabled professional learning expands, VMC provides timely feedback, sustained relational support, and access to expert mentors regardless of geographic constraints. Building on decades of scholarship in mentoring, coaching, and capacity-building in education, Beverly J. Irby has been at the forefront of developing structured mentoring frameworks (Irby, 2015; 2020), digital coaching protocols (Irby et al., 2022), and research-based models that enhance professional growth and instructional effectiveness (Abdelrahman et al., 2021; Irby & Pugliese, 2020). Irby et al. (2023) recently showed how virtual leadership learning communities help teachers become more reflective, work together, and build their professional identities. Their research shows that virtual mentoring and coaching, when intentionally designed and aligned to clear improvement goals, create meaningful opportunities for reflective practice, responsive pedagogy, and leadership development (Etchells et al., 2020). As universities and school districts increasingly turn to virtual platforms, VMC represents a critical innovation in preparing and sustaining effective educators and leaders.

Irby and colleagues have also been national leaders in developing and studying VMC systems that integrate real-time, practice-embedded feedback to support teacher growth, particularly for bilingual and ESL educators. Their work demonstrates that when teachers receive immediate, targeted coaching—often through remote observation tools, synchronous mentoring sessions, and digital feedback loops—they are better able to refine instructional strategies aligned with effective practices for English learners. For example, Tong et al. (2014) conducted a longitudinal study showing that ongoing online coaching with structured mentor input significantly improved teachers' implementation of evidence-based practices in bilingual

classrooms. Similarly, Lara-Alecio et al. (2020) highlighted how systematic mentoring frameworks, including virtual observation and feedback protocols, can accelerate teacher development and support sustained instructional improvement. These systems—rooted in Irby's long-standing research on mentoring and leadership—illustrate how virtual coaching environments create meaningful spaces for reflective practice, instructional responsiveness, and continuous improvement in educator preparation and professional learning (Irby et al., 2023).

Teacher mentoring and coaching are essential for developing and strengthening instructional capacity and pedagogical practices (Booker & Russell, 2022; Kraft et al., 2018). Virtual mentoring and coaching with real-time feedback (VMC-RTF), which is a process that allows teachers to reflect on their teaching, set specific goals for improvement, and engage in professional dialogue, all facilitated remotely and first created and tested in a federal grant with the U.S. Department of Education (English Language and Literacy Acquisition Validation [ELLA-V] and Literacy-Infused Science with Technology Innovation [LISTO]—both grants with the Lara-Alecio, Irby, and Tong research teams); they published work from their research on the topic (Lara-Alecio et al., 2024). According to the grant team consisting of Lara-Alecio, Irby, and Tong (2017; 2020), real-time feedback means that during virtual observations, teachers receive simultaneous support and feedback while delivering instruction, allowing them to make in-the-moment adjustments to serve their students better. This process builds on teachers' existing pedagogical practices by leveraging technologies, such as an online platform and video conferencing, to connect mentors and teachers remotely (Abdelrahman et al., 2021). The approach overcomes geographical, temporal, and financial barriers (Irby et al., 2022; Wake et al., 2017) while providing timely, instant, and individualized feedback that supports targeted professional growth (Briscoe, 2019; Elek & Page, 2019; Franko et al., 2016; Irby et al., 2023; Sharplin et al., 2016; Vargas et al., 2023).

Lara-Alecio, Irby, and Tong (2019) received another grant in which they incorporated VMC-RTF as an innovative component of Project **V**irtually-**I**nfused **C**ollaborations for **T**eaching and Learning **O**pportunities for **R**ural **Y**outh (VICTORY, Grant Award No. S411B200055), a federally funded education project designed to enhance literacy-infused science (LIS) instruction in rural schools across Texas. VICTORY supported teachers, students, and families by enhancing instructional practices and improving students' science and literacy outcomes through a randomized control trial (RCT) that examined differences between virtual/online and face-to-face teaching and learning environments. Each year, Project VICTORY served about 1,500 high-needs students, including those from economically challenged backgrounds eligible for free or reduced-price meals and English learners. The program followed students longitudinally from third through fifth grade.

In VICTORY, science teachers received 10 weeks of virtual professional development (VPD), along with Earth science curriculum and materials, to deliver two 45-minute lessons per week over a nine-week implementation period. As part of the VPD, VICTORY teachers participated in live VMC-RTF sessions, during which an experienced mentor observed their classroom teaching and provided real-time instructional feedback. Following the live sessions, mentors also provided written feedback, allowing teachers to reflect and refine their practice.

Lara-Alecio et al.'s VMC-RTF model was designed to (a) increase teachers' fidelity in implementing the literacy-infused science instructional strategies that were part of the intervention; (b) encourage teachers to notice and take advantage of in-the-moment pedagogical opportunities; and (c) support teacher content knowledge and help minimize scientific misconceptions.

Implementation of VMC-RTF

Three experienced project coordinators, skilled in mentoring and coaching elementary teachers and school leaders, conducted VMC-RTF sessions aimed at enhancing science teachers' instructional capacity, improving teaching quality, and ensuring the fidelity of implementation of instructional strategies. All VICTORY teachers were asked to participate in two 45-minute coaching sessions during the nine-week LIS intervention. Depending on their preference, teachers used web conferencing apps such as GoToMeeting, Zoom, and Google Classroom for these live sessions, which allowed coaches to virtually observe teachers' classroom instruction, including methods, pacing, delivery, and classroom management. Through the use of Bluetooth headsets, coaches provided real-time feedback using the bug-in-ear (BIE) coaching model, enabling teachers to immediately respond to instructional feedback.

Phase 1: Training and Scheduling

Before the VMC-RTF sessions, project coordinators provided teachers with comprehensive training on the VMC-RTF process. Instructions for the process were embedded into an online professional development session. Resources on setting up the Bluetooth device were distributed follow-up.

Phase 2: Personalized VMC-RTF Session

Each VMC-RTF session lasted approximately 20 minutes and was closely aligned with the LIS curricular intervention and VMC-RTF checklist. The coaches supported teachers with positive, non-evaluative feedback. Coaches worked to build teachers' familiarity with the lesson, confidence and ability to present, delivery of targeted strategies, and student engagement. The VMC-RTF coach checklist guided this feedback. For example, the coach monitored whether the teacher adhered to the LIS lesson plans, prepared and used instructional materials effectively, utilized embedded strategies, and maintained an appropriate, smooth pace throughout the lesson.

Phase 3: Pedagogical Reflection and Feedback

During each VMC-RTF session, teachers received focused, concise, real-time verbal feedback from their coach. Upon completion of each VMC-RTF session, the coach provided written feedback via email, highlighting both strengths and suggestions for improvement. Teachers were encouraged to reflect on their lessons and VMC-RTF experiences using the VMC-RTF feedback sheet after receiving the written feedback.

Participants

The sample included 43 fourth-grade science teachers who participated in VMC-RTF during the fall of 2022. The majority of the participants were female (34; 79.07%) and White (27; 62.79%). Out of 39 teachers who reported their highest education level, one held a Ph.D. (2.33%), eight had a master's degree (18.60%), 24 had a bachelor's degree (55.81%), and six had a bachelor's degree with some graduate coursework (13.95%). Additionally, 39 teachers provided information about their teaching experience, which ranged from 0 to 32 years, with an average of 11.74 years. Of these, 38 teachers shared details about their science teaching experience, with an average of 8.32 years of science teaching.

Data Collection & Analysis

Crucial components of the VMC-RTF process included opportunities for observation, feedback, reflection, and evaluation (Irby et al., 2022). Therefore, the research team collected various types of qualitative data: (a) real-time verbal feedback from coaches during the lessons, (b) written feedback from coaches through the VMC-RTF feedback sheet, (c) teachers' written reflections recorded via the same feedback sheet, and (d) teachers' perceptions and experiences of their VMC-RTF sessions (recorded during end-of-semester focus group interviews conducted by project staff). All teachers consented to having their classroom lessons and interviews recorded. The lessons and interviews were transcribed using Trint automated transcription software.

Thematic analysis was employed to identify themes related to each research question. Two experienced coders—a project coordinator and a postdoctoral research associate who had extensive experience with the project's curriculum, implementation, and coding procedures—carried out the coding process. The analysis followed Braun and Clarke's (2006) six-step method: (a) familiarizing with the data, (b) generating initial codes, (c) searching for themes, (d) reviewing themes, (e) defining and naming themes, and (f) writing up the findings.

First, the coders read through all the coaching feedback, teacher reflections, and teacher responses to become familiar with the data and noted initial coding ideas. Next, they systematically reviewed and independently manually coded the data. After coding, the data were organized into potential themes. The coders then met several times to review and refine these themes. During these discussions, the themes were defined and named. The team worked to achieve 100% agreement on the themes through three in-person meetings, resolving any discrepancies by consensus. Finally, all codes were organized under the finalized themes with example quotations.

To ensure the trustworthiness and credibility of this qualitative study, we used a low-inference strategy, citing direct quotations from coaches and teachers to support each theme. Peer debriefing was also used to strengthen credibility. Initially, the coders individually reviewed the data and identified themes. They then met several times as a team to analyze the data, resolve any inconsistencies, and strengthen the research team's reliability (Creswell, 2007; Creswell & Poth, 2017). The coders cross-checked their code, and another project lead coordinator subsequently confirmed it to ensure accuracy.

Results

RQ1: What types of feedback did teachers receive from their coaches in VMC-RTF sessions?

The coders analyzed the coaches' feedback by type of instructional feedback provided to the teachers. The analysis revealed six main themes: (a) classroom management, (b) use of language/literacy strategies and practices, (c) application of science instructional practices, (d) implementation of enrichment and extension strategies, (e) delivery and pacing of lessons, and (f) encouragement and suggestions. Sample themes, along with representative quotes, are presented in Table 1.

Table 1

Sample Coaching Feedback Themes and Exemplary Quotes

Theme	Exemplary Quotes
Classroom Management	*I really like your classroom–so much space and so clean. I admire your organization–using trays and then having the students responsible for checking and determining what they represent in the real world saves instructional time. Use of your document camera helps students stay on task. You have excellent classroom monitoring skills and anticipating your students' behaviors. Your students are also very well behaved and seem to be focused and calm.* *The clapping strategy to get the attention of students was effective. Also, it is obvious that students are familiar with the team leader strategy that you used for the group work. This is important for classroom instruction routines.*
Use of Language/Literacy Strategies and Practices	*Giving students time to talk in their table groups before calling on them to answer aloud reduces anxiety and allows students to rehearse answers.* *You provided a lot of opportunities for students to share and practice using academic language by calling on multiple students, and I liked how you had the young man stand in the middle of the room to demonstrate his shadow. Putting the dots underneath the syllables and then connecting them when blending the word provides an additional level of support.*

The analysis indicated that coaches paid significant attention to teachers' classroom management skills, which are crucial in creating a productive learning environment, minimizing disruptions, and making efficient use of instructional time. By focusing on this aspect, coaches offered targeted feedback to help teachers develop effective strategies for engaging students. Coaches also watched how teachers taught science and used language and literacy strategies. They stressed the importance of following the curriculum and using literacy strategies in science lessons. Coaches also closely monitored lesson delivery and pacing and provided feedback on how teachers could adjust their timing and presentation to enhance clarity and effectiveness.
Furthermore, coaches offered a balanced mix of encouragement, praise, and constructive suggestions. They recognized teachers' strengths and successful strategies while also providing thoughtful suggestions for improvement. This supportive approach aimed to build teachers' skills and self-efficacy.

RQ2: What were teachers' perceptions and reflections on their VMC-RTF experiences with their coaches?

Teachers' reflections revealed a generally positive response to the VMC-RTF sessions. We identified six major themes: (a) quality of the VMC-RTF sessions, (b) feedback from the coaches, (c) teachers' "a-ha" moments, (d) changes made by teachers as a result of coaching, (e) challenges during the VMC-RTF sessions, and (f) recommendations for improving the sessions. Sample themes and example quotations for these themes are outlined in Table 2.

Table 2

Sample Teacher Reflection Themes and Exemplary Quotes

Theme	Exemplary Quotes
Quality of the VMC-RTF Sessions	Teacher 1: *I really enjoyed that because my coach was giving me feedback as I was teaching and I thought it was going to disrupt my teaching because I was going to be paying, I have A.D.D., so I thought it was going to really mess with me. And it didn't. It really helped me to see what I was doing and what I should do better. And so that really helped me because I was able to walk around.* Teacher 2: *We enjoyed it. The kids really showed out. They, you know, they knew somebody was watching. And so, they were real enthusiastic about somebody watching them.* Teacher 3: *So. Okay, I'll say I was dreading it at first because just the thought of having somebody in my ear while I was trying to talk, I would just was like, oh, this is going to be terrible. But it was really awesome. I mean, it was like having a little cheerleader in your ear the whole time because she really was just pointing out things that I was doing well, like she would throw in a suggestion every now and then. But I mean, as teachers, we don't ever get instant feedback like we're supposed to give the kids, you know? So, it kind of really helps you to see why that instant feedback is so important to the kids. Because, I mean, it even like as a teacher lifts you up and just makes you feel better about what you're doing.*
Feedback from the Coaches	Teacher 4: *It went really it was it was a good experience. I got a lot of really great feedback and so it was a good experience, I thought.* Teacher 5: *I already read your comments and I agree with them. And so thank you for the coaching. I appreciate it.*

Teachers' reflections and perceptions of their VMC-RTF experiences were generally positive, highlighting the quality and effectiveness of the sessions. Based on coaches' feedback, teachers also recognized specific areas for improvement in their instruction, such as better preparation of materials and adjustments to the teaching pace. However, some challenges were also noted, including technical difficulties and initial discomfort with the bug-in-ear virtual coaching format. Recommendations for improvement included conducting practice meetings to ensure smooth technical execution. Overall, teachers perceived the VMC-RTF sessions to be a valuable PD experience that enhanced their instructional practices and improved their instruction.

Conclusion and Implications for Policy and Practice

The study demonstrates the powerful impact of VMC-RTF on instructional practice and teacher development, particularly for rural fourth-grade science teachers across Texas. Teachers who

participated in live VMC-RTF sessions received immediate verbal feedback and detailed written feedback from coaches who had been there before. This process allowed teachers to reflect on their teaching practices and make improvements based on the feedback and suggestions provided. An analysis of teachers' perceptions found that VMC-RTF was both valuable and well-received. Participants said that it made them more confident, helped them grow professionally, and made their teaching more consistent.

It was important for coaches and teachers to build a relationship and trust with each other so that teachers could learn and grow in a safe space. Moreover, the study emphasized the ability of technology-facilitated coaching to overcome traditional barriers of distance and accessibility and presented a scalable model adaptable to broader educational contexts.

Building upon these results, education agencies and districts need to invest in robust technology infrastructure, especially in underserved areas, to support virtual mentoring and coaching initiatives. Policies should promote regular, technology-enhanced professional learning and ensure all teachers have equitable access to devices, connectivity, and training. Integrating formative feedback from coaching into teacher evaluation systems and formalizing coach training are key steps to sustain and refine these practices. Collectively, these policy and practice recommendations provide a roadmap for scaling and institutionalizing successful virtual coaching models, such as VMC-RTF, to support teacher growth and advance student outcomes throughout Texas and beyond.

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