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How Studies of QRIS Measure Quality Improvement Activities: An Analysis of Measures of Training and Technical Assistance

Sheila Smith, Xiaobei Dong, Sam Stephens and Kathryn Tout

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INTRODUCTION

A growing body of research documents the implementation, performance, and validity of Quality Rating Improvement Systems (QRIS), now operating in about 40 states.¹ Although QRIS share core components (see box 1), they vary widely in design and in their stage of development. Key features of some states' QRIS, such as their standards and methods of quality assistance, have been modified multiple times over several years, while other states' QRIS are in pilot or an early phase of state-wide implementation.²

The variations in stage of development are reflected in the different types of research on QRIS, which include descriptive studies of QRIS implementation (e.g., the number and proportion of eligible programs electing to participate) and studies that address particular questions about QRIS performance (e.g., the percent of programs moving up in quality ratings over a period of time). Other studies have assessed the validity of QRIS by examining how measures of classroom quality and patterns of children's development in early care and education (ECE) settings are associated with the settings' earned level of quality in the QRIS. These studies investigate whether QRIS ratings are differentiating quality in meaningful ways and whether quality is associated with preschool children's developmental progress. State

Box 1

Components of QRIS

Quality Standards

Accountability

Program and Provider Outreach and Quality Improvement Supports

Financial Incentives Linked to Compliance with Standards

Consumer Education

Adapted from [NAEYC Quality Rating and Improvement Systems \(QRIS\) Toolkit](#)

QRIS administrators seeking information that can inform ongoing efforts to promote the effective operation of QRIS have sponsored QRIS studies focused on these types of validity, implementation, and performance questions.

Despite differences mentioned above, all QRIS have the common goal of improving the quality of ECE programs; each of these systems offers some form of professional development embodied in the "I" (improvement) component of QRIS. These include group training, technical assistance, coaching, and other supports. Apart from QRIS studies, a growing body of research on early childhood professional development has identified strategies that may hold promise for QRIS. This research suggests that on-site coaching, often combined with group training, can contribute to improvements in the quality of teaching and gains in children's learning, especially when it is focused on teaching practices that support growth in key domains of school readiness such as language, early math, and social-emotional development.³

Research on professional development interventions that have yielded positive outcomes has also highlighted certain coaching methods, such as modeling and feedback, that may be key to helping teachers strengthen targeted practices.⁴ Analyses of coaching research has also led some investigators to suggest that the necessary amounts of coaching needed to achieve change is related to the complexity and scope of the targeted teaching practices. For example, a longer duration of coaching may be needed to help teachers acquire skills in effectively supporting children's language skills across the curriculum compared to the amount of coaching needed to help teachers use open-ended questions and explain new vocabulary during shared book-reading.⁵ While there is still much to learn about specific features of professional development that are most effective, including necessary dosage and appropriate combinations of methods under different conditions, current quality improvement research conducted outside of QRIS offers some important guideposts about promising approaches.

In the context of the body of research on coaching and other technical assistance, examining measures of quality improvement activities can offer valuable information for administrators who design, operate, and work to improve QRIS, and for researchers who conduct QRIS studies. First, using measures of professional development activities, including coaching, that assess features such as content, methods, and dosage, would permit an assessment of how closely QRIS quality improvement activities are aligned with the promising approaches identified in the literature. By examining whether studies use measures that can identify the content focus of coaching and coaching methods, it is possible to determine whether current studies allow an assessment of promising practices (e.g., coaching focused on supports for language skills, coaching that uses feedback), and if not, what gaps need to be filled. Second, given the significant resources allocated in QRIS to professional development activities, it is important to determine whether current measures adequately capture important dimensions of these activities, including group training and coaching.⁶ Efforts to improve these outcomes would be greatly supported by studies' capacity to reliably identify effective features of professional development activities that may contribute to key outcomes. Third, the varied QRIS across states offer a laboratory for learning about different quality improvement strategies that are implemented broadly. An analysis of current measures of professional development in QRIS studies can suggest the types and scope of measures that might be needed in the field in order to maximize learning about quality improvement in light of this opportunity.

This brief reports on the results of an analysis that addressed two questions concerning a large set of QRIS studies conducted between 2006 and 2016:

1. *How are two types of professional development activities, group training for early childhood staff (TR) and technical assistance (TA), measured in QRIS research?*
2. *What specific features of TR and TA are measured in this research?*

The remaining sections of this brief discuss:

- **Methods:** The scope of QRIS studies and coding scheme used in the analysis
- **Results:** The percent and type of studies that measure specific features of QRIS TR and TA
- **Discussion and recommendations** for state QRIS administrators, researchers, and other stakeholders engaged in building QRIS capacity

METHODS

The set of studies analyzed for this brief were those included in a comprehensive list of state QRIS evaluation and research publications, [Quality Rating and Improvement System State Evaluations and Research](#), compiled by [Child Care and Early Education Research Connections](#). These publications were identified through Research Connections' regular searches, which are conducted to continuously update its publications database. We identified 212 publications from 2006 to 2016 at the time the analysis began. This included studies of QRIS in 31 states, and most states had multiple studies. When multiple publications on a single study were available, the publication providing the most detailed information on measures was used for the analysis (e.g., a technical report instead of a summary report).

The measures of TR and TA examined in the studies were typically not standardized or validated. Each identified "measure" of TR and TA was an instance in which clearly defined data were collected for the purpose of documenting particular dimensions of the TR or TA such as dosage or teachers' perception of quality. A wide variety of different types of measures was found in the studies, including measures based on interview data, coaching records, attendance data, and observations.

Training (TR) and technical assistance (TA) were coded separately, relying on the study's description of measures. TR was coded when the study referred to off-site training in a group format. TA was coded for coaching or other on-site

activities in which a TA provider or coach offered guidance to a provider. All instances of measures of TR and TA were coded, even if the results of analyzing the measures were not presented in the research report or publication.

The coding protocol captured four types of information about the QRIS studies:

- The type of study: Validation, evaluation, pilot or “other.” A study could be characterized by two study type codes since terms such as “validity study of a pilot QRIS” were found in the research publications, and coding was based on researchers’ descriptions of the studies.
- Content of the TR or TA: These codes were used for measures of TR or TA that had a particular content focus. An example is “environment,” used when a study employed a measure of TR or TA that focused on improving the quality of the classroom or child care home-based environment. See box 2 for a description of codes.
- Delivery of the TR or TA: These include codes for measures of TA that capture coaching strategies such as “modeling” teaching practices; TR or TA dosage; methods of delivering TR or TA such as on-site visits or phone calls; and providers’ reported experience with TR or TA, including the perception that TR or TA helped improve the providers’ practices.
- Director/training codes: These are used for measures of TR or TA that target program directors, and TR and TA that help providers meet QRIS PD and training requirements and attain professional credentials. A code for measures of training or supervision of TA and TR providers is also used.
- A “catch-all” code called “other,” requiring the coder to write in a description of the measure, was used for measures of TR or TA that fell outside the other descriptive codes in the protocol.

An advanced graduate student with a professional background in early childhood conducted the initial coding of each study. Following training on

the coding protocol, a second coder with research experience related to QRIS independently coded eight studies, selected to illustrate a range of codes in the coding protocol, based on the initial coding. The first and second coder achieved agreement on coding above 85 percent of the possible coded items, providing evidence that the coding protocol was reliable.

RESULTS

Types of studies

Overall, 62 (29%) of the 212 studies could be given codes for TR or TA because they had measures of TR and TA. Among coded studies, 40 percent were evaluations, and 18 percent were pilot evaluations. The next largest group, 31 percent, were coded “other,” and included descriptive studies of QRIS implementation and quality improvement initiatives. Small numbers of validation (3%), pilot (6%), and pilot validation (2%) studies were also among coded studies.

Measuring the content of TR and TA

Table 1 shows the following results for the content coding of the studies. Within the smaller group of studies in which TR and TA measures received coding on any dimension in the coding protocol, fewer than one-quarter were measures that captured content. Across these studies, the most frequently coded content areas for TR measures were child development and curriculum (each identified in 10% of the studies) and quality assessment and social-emotional growth (each identified in 8% of the studies). For TR measures, the lowest frequency content areas that were coded were individualized learning (no studies measured this content area of TR), and math instruction (2%). For TA measures, the most frequently coded content areas were specifically intended to help teachers and providers move up the QRIS rating scale (24%) and TA focused on the environment and quality assessment (both 15%). The lowest frequency content areas coded for TA were individualized learning and English language learners (none in either area) and child development, early literacy, math, and special needs (2% in each area).

Measuring other dimensions of TR and TA

Table 2 presents results for other coded dimensions of TR and TA.

Dosage, delivery mode, and coaching strategies. Measures received the “dosage” code when they measured the amount or duration of TR or TA. While only 3 percent of coded studies measured the dosage of TR, 42 percent measured the dosage of TA. The code “delivery mode” was used for measures of TR or TA that indicated the method of providing quality assistance such as on-site visits, on-line training, phone-calls, or videoconference. The delivery mode was measured in only a few studies, slightly more often for TA (5%) than TR (2%). “Coaching strategies” was a code used for measures of TA only; it was given to measures of specific coaching strategies such as modeling, observing, or giving feedback about teaching practices. Coaching strategies was measured in 16 percent of coded studies.

Experience with TR and TA. Measures of teachers’ or providers’ self-reported views of the extent to which they found that TR or TA helped improve their practice, was supportive, or was otherwise valuable were coded as “experience with TR or TA.” ECE staff experience with TR and TA was the most frequently measured dimension of quality assistance: 32 percent of coded studies measured this dimension for TR and 61 percent of coded studies measured it for TA.

Meeting QRIS PD requirements. Another code was “TR and TA to help providers meet QRIS professional development requirements and attain professional credentials.” This code was given to measures of TR and TA that was intended to help ECE staff develop a professional development plan, find appropriate trainings, establish credentials for the state registry, and identify credit or certificate bearing courses that meet QRIS requirements and their professional development goals. A relatively small percentage of studies measured TR and TA that provided this type of assistance: 11 percent of coded studies measured this dimension of TR and 16 percent measured this dimension of TA.

Assisting ECE program directors. The code “TR and TA targeted at directors” was given to measures of TR and TA that targeted program directors to strengthen their knowledge and ability to promote program quality, support teachers, and meet QRIS requirements. Measures of TR and TA aimed at ECE directors were used in 11 percent of coded studies for both TR and TA.

Training and supervision of PD or TA specialists. The code “training and supervision of TR or TA specialist” was used for measures of pre-employment and on-the-job training as well as supervisory support for trainers, TA specialists and coaches. While only one study measured training and supervision for TR specialists, 11 studies (18 percent of coded studies) measured this type of support for TA specialists and coaches.

DISCUSSION AND RECOMMENDATIONS

The most striking finding from the analysis is that very few studies of QRIS measure any dimension of TR and TA. The provider’s experience with TA (e.g., perception of its value) and dosage of TA were the features of quality assistance that were most commonly measured. These dimensions of TA may also be among the most straightforward to measure. For example, dosage can be measured by counting time spent in recorded TA visits while experience with TR or TA can be captured in interview questions and focus group probes. In addition to the relative ease of measuring certain dimensions of TR and TA in QRIS, it is important to acknowledge that researchers are likely to select measures of quality improvement activities they believe they are most likely to encounter. Especially when researchers work with QRIS administrators in the design of a study, they may intentionally select measures of anticipated high frequency forms of professional development. It is possible this expectation led to the higher frequency of TA content codes focused on moving up the QRIS levels, the environment, and quality assessment – all directly related to meeting QRIS standards – rather than measures of TA focused on more specific content, such as

helping teachers support children’s language skills. In other words, the studies’ designs are likely a reflection of the designs and operation of QRIS.

As the field of QRIS research has evolved, researchers have suggested ways to strengthen QRIS studies that could improve their capacity to answer questions of critical importance to QRIS administrators and funders, extend the field’s knowledge about effective quality improvement strategies, and benefit young children and their families.⁷ In keeping with this goal, the following recommendations focus on strategies that could help improve the measurement of TR and TA in QRIS studies.

Increase the use of measures in QRIS studies that can identify potential drivers of quality improvement and children’s learning.

There are at least two types of measures that can help assess the presence of possible drivers linked to quality improvement and children’s learning examined in the literature discussed earlier. One type would capture the **content focus of TR and TA**. For example, such a measure could be created with a pull-down menu in an on-line coach’s log that allows coaches to indicate the content focus of coaching during a site visit, such as coaching to improve “the classroom environment,” “practices that support children’s language development,” “practices that support growth in other school readiness domains,” and other specified activities. Another type of measure related to potential drivers of quality and child outcomes is one that captures **coaching strategies** (e.g., modeling and feedback). Continuing with the example of a coach’s log, coaches could check off their use of strategies from a short list that includes those considered to be key elements in coaching that lead to quality improvement. In both examples, dividing the coaching visit into quarters and asking about content and strategies for each quarter could provide an estimate of how long the coach focused on content in one or more areas or used different strategies.

Include measures of key supports for the effective delivery and continued use of TR and TA.

Implementation science points to the importance of training for individuals delivering interventions, such as professional development to help ensure that services are delivered at a high level of fidelity and quality.⁸ The inclusion of **measures of supervision and training provided to TR and TA specialists** could yield findings that help explain the quality and focus of TR and TA, if these are measured, and inform efforts to improve TR and TA. For example, if a QRIS evaluation found that TR and TA are focused on limited areas of content, and teachers report dissatisfaction with these activities, findings concerning features of TR and TA specialist training and supervision could suggest possible gaps in supports for QI specialists. Emerging research on site-based features of quality improvement suggest the important role that early care and education program directors play in promoting continuous quality improvement by directly supporting teachers’ efforts to engage in high quality practices, and by creating an environment that promotes peer to peer support and learning.⁹ Including **measures of TR and TA that target the program director** in QRIS studies can expand studies’ capacity to assess the contribution of this potentially important type of quality support.

Measure multiple dimensions of TR and TA.

TR and TA content, strategies, and dosage may combine or interact with each other to produce outcomes. The inclusion of measures that capture multiple dimensions of quality improvement delivered to ECE settings is likely to increase QRIS studies’ ability to explain their results. For example, TA focused on key early learning domains, at a certain dosage, with support for directors, and perceived as valuable by teachers might be more predictive of improved practice and positive child outcomes than this same set of quality supports that is viewed by teachers as unhelpful, which might signal a problem with the quality of the TA.

Invest in the development of new TR and TA measures that can test their feasibility and reliability.

Measures of TR and TA that can assess features of quality improvement that are potential drivers of quality and child outcomes must be both practical and reliable. TR and TA measures derived from observations, as well as those based on reports of those who deliver or receive TR and TA, must capture reasonably consistent information in order to be reliable. For example, do two observers agree on the same content focus when they use codes to describe a coaching session? Or, when coaches record the same information in their logs, via predetermined codes, do they correctly use the definitions for content codes? Methods for determining reliability will vary, but some lower-cost options are possible, such as periodically having a reliable coder observe a coaching session and check the coach's log for agreement. The development of practical measures is equally important. This could best be accomplished through partnerships between QRIS administrators and researchers to develop and test these measures with feedback from coaches and teachers who would record information about TR and TA.

CONCLUSION

As QRIS research continues to evolve, there is an opportunity to greatly enrich our understanding of quality improvement activities and their role in helping programs achieve higher levels of quality and produce stronger gains in children's learning and development. There is a need for greater investment in the measurement of training and technical assistance and the development and testing of new measures that are both valid and practical for use in research and in the ongoing operations of QRIS (e.g., record keeping of coaches and recipients of technical assistance). Continued partnerships between researchers and administrators, with involvement of key players who implement QRIS – coaches, teachers, and trainers – will be vital to advancing this work.

Table 1

	TR			TA/Coaching		
	Number	% of coded studies	% of examined studies	Number	% of coded studies	% of examined studies
Environment	2	3%	1%	9	15%	4%
QRIS rating scale	2	3%	1%	15	24%	7%
Quality assessment	5	8%	2%	9	15%	4%
Child assessment	2	3%	1%	4	6%	2%
Child development	6	10%	3%	1	2%	0%
Curriculum	6	10%	3%	6	10%	3%
Teaching	2	3%	1%	5	8%	2%
Social-emotional	5	8%	2%	3	5%	1%
Language development	2	3%	1%	2	3%	1%
Early literacy development	2	3%	1%	1	2%	0%
Math	1	2%	0%	1	2%	0%
English language learners	2	3%	1%	0	0%	0%
Special needs	2	3%	1%	1	2%	0%
Health & safety	4	6%	2%	8	13%	4%
Individualized support	0	0%	0%	0	0%	0%
Parent/family engagement	4	6%	2%	6	10%	3%

Table 2

	TR			TA/Coaching		
	Number	% of coded studies	% of examined studies	Number	% of coded studies	% of examined studies
Coaching strategies						
Dosage	2	3%	1%	26	12%	12%
Delivery mode	1	2%	0%	3	5%	1%
Experience with TR/TA-coaching	20	32%	9%	38	61%	18%
TR;TA/Coaching directed at directors	7	11%	3%	7	11%	3%
TR; TA/Coaching to help providers meet QRIS professional development/training requirements and attain professional credentials	7	11%	3%	10	16%	5%
Other	11	18%	5%	17	27%	8%

Table 2 cont.

	TR					
	TR (Training)			S (Supervision)		
	Number	% of coded studies	% of examined studies	Number	% of coded studies	% of examined studies
Training/ supervision of TR provider;TA provider/Coach	1	2%	0%	0	0.0%	0.0%

	TA/Coaching					
	TR (Training)			S (Supervision)		
	Number	% of coded studies	% of examined studies	Number	% of coded studies	% of examined studies
Training/ supervision of TR provider;TA provider/Coach	6	10%	3%	5	8%	2%

CODES AND DEFINITIONS

Environment: TR;TA/Coaching focused on improving the classroom/home-based environment.

QRIS rating scale: TR;TA/Coaching focused on improving features that help the center/home-based setting move up on the rating scale, including help with a quality improvement plan.

Quality assessment: TR;TA/Coaching focused on helping teachers/providers learn to conduct self-assessments with classroom quality assessment instruments, e.g. ERS, CLASS, etc.

Child assessment: TR;TA/Coaching focused on helping teachers/providers learn to conduct child assessments.

Child development: TR;TA/Coaching focused on enhancing teachers/providers' knowledge of child growth and development.

Curriculum: TR;TA/Coaching focused on helping teachers/providers improve their use of a curriculum or develop lesson plans related to a curriculum or learning goals.

Teaching: TR;TA/Coaching focused on enhancing teachers/providers' general teaching practices, e.g. age appropriate activities, interaction with children; and teaching activities that are not explicitly part of a curriculum (e.g., art activity)

Social-emotional: TR;TA/Coaching focused on improving teacher/provider practices that support children's social-emotional growth.

Language development: TR;TA/Coaching focused on improving teacher/provider practices that support children's language development.

Early literacy development: TR;TA/coaching focused on improving teacher/provider practices that support children's early literacy development.

Math: TR;TA/Coaching focused on improving teacher/provider practices that support children's learning about math.

English language learners: TR;TA/Coaching focused on improving teacher/provider practices that support the learning of English Language Learners.

Special needs: TR;TA/Coaching focused on improving teacher/provider practices that support children with special needs.

Health & safety: TR;TA/Coaching focused on improving teacher/provider practices that support children's health and safety.

Individualized support: TR;TA/Coaching focused on helping teachers/providers learn to monitor children's learning and individualize the curriculum or provide extra learning supports to children who need them.

Parent/family engagement: TR;TA/Coaching focused on helping teachers/providers increase parent/family engagement, including both activities (e.g. parent night and parent-teacher conferences) and communication skills (e.g. dealing with difficult parents, how to relate to parents, etc.)

Coaching strategies: Methods used during coaching, e.g., modeling practices, observing and giving feedback, and showing DVDs of best practices, etc.

Dosage: Amount and length of TR; TA/Coaching. Delivery mode: How TR;TA/Coaching was provided, e.g. on-site visits, phone calls, online training, teleconference learning, etc.

Satisfaction with TR;TA/Coaching: Teacher/provider self-reported experience, e.g. whether they found TR and TA/coaching supportive, whether they believed TR and TA/Coaching helped improve their practices, etc.

TR;TA/Coaching targeted at directors: TR;TA/Coaching targeted at program directors to strengthen their knowledge and ability to promote program quality, support teachers, and meet QRIS requirements.

TR; TA/Coaching to help providers meet QRIS PD and training requirements and attain

professional credentials: TR; TA/Coaching focused on helping providers develop a PD (not quality improvement) plan, find appropriate trainings, establish credentials in state registry; identify credit or certificate bearing courses that meet teachers' and directors' PD goals.

Other: All other TR;TA/Coaching that is measured but does not fall in any of the above categories.

Training/supervision of TR provider;TA provider/Coach: Pre-employment and on-the-job trainings as well as supervisory support for TR trainers, TA providers, coaches.

REFERENCES

- ¹ QRIS Learning Network, Current Status of QRIS in States (January, 2017)
<http://qrisnetwork.org/qris-state-contacts-map>
- ² Ferguson, D. (2016). Quality Rating and Improvement System State Evaluations and Research. *Child Care & Early Education Research Connections*.
- ³ Isner, T., Tout, K., Zaslow, M., Soli, M., Quinn, K., Rothenberg, L., & Burkhauser, M. (2011). Coaching in early care and education programs and quality rating and improvement systems (QRIS): Identifying promising features. *Washington, DC: Child Trends*;
- Neuman, S. B., & Cunningham, L. (2009). The impact of professional development and coaching on early language and literacy instructional practices. *American educational research journal*, 46(2), 532-566;
- Pianta, R., Hamre, B., Downer, J., Burchinal, M., Williford, A., LoCasale-Crouch, J., ... & Scott-Little, C. (2017). Early Childhood Professional Development: Coaching and Coursework Effects on Indicators of Children's School Readiness. *Early Education and Development*, 1-20;
- Conners-Burrow, N. A., Patrick, T., Kyzer, A., & McKelvey, L. (2017). A preliminary evaluation of REACH: Training early childhood teachers to support children's social and emotional development. *Early Childhood Education Journal*, 45(2), 187-199.
- ⁴ Snyder, P. A., Hemmeter, M. L., & Fox, L. (2015). Supporting implementation of evidence-based practices through practice-based coaching. *Topics in Early Childhood Special Education*, 35(3), 133-143.
- Pianta, R. C., DeCoster, J., Cabell, S., Burchinal, M., Hamre, B. K., Downer, J., ... & Howes, C. (2014). Dose– response relations between preschool teachers' exposure to components of professional development and increases in quality of their interactions with children. *Early Childhood Research Quarterly*, 29(4), 499-508.
- ⁵ Zaslow, M., Tout, K., & Halle, T. (2012). *On-site approaches to quality improvement in quality rating and improvement systems: Building on the research on coaching*. (Research-to-Policy, Research-to-Practice Brief OPRE 2012-40). Washington, DC: U.S. Administration for Children and Families, Office of Planning, Research and Evaluation. Retrieved December 6, 2012, from http://www.acf.hhs.gov/sites/default/files/opre/coaching_brief.pdf.
- ⁶ Compendium, Q.R.I.S. (2014). A catalog and comparison of quality rating and comparison of quality rating and improvement systems. Retrieved from <http://qriscompendium.org/>
- Dichter, H. (2015), Rising to the Challenge: Building effective systems for young children and families – Build E-book. <http://www.buildinitiative.org/Portals/0/Uploads/Documents/Chapter8Mathias.pdf>
- ⁷ Tout, K. (2013). Look to the stars: Future directions for the evaluation of quality rating and improvement systems. *Early Education & Development*, 24(1);
- Zaslow, M., Tout, K., & Halle, T. (2012). On-site approaches to quality improvement in quality rating and improvement systems: Building on the research on coaching. *Research-to-Policy, Research-to-Practice Brief OPRE*, 40.
- ⁸ Metz, A., Halle, T., Bartley, L., & Blasberg, A. (2013). The key components of successful implementation. In T. Halle, A. Metz, & I. Martinez-Beck (Eds.), *Applying implementation science in early childhood programs and systems* (pp. 21-42). Baltimore, MD: Brookes.
- ⁹ Ehrlich, S.B., Pacchiano, D.M., Stein, A.G., & Luppescu, S. (2016). Essential organizational supports for early education: The development of a new survey tool to measure organizational conditions. Chicago, IL: University of Chicago Consortium on School Research and the Ounce of Prevention Fund.

