

A Multimedia Option for Delivering Feedback and Professional Development to Teachers

Rachel L. Kunemund¹ , Michael J. Kennedy¹, Lindsay M. Carlisle¹,
Victoria J. VanUitert¹, and Sean D. McDonald¹

Abstract

All teachers need ongoing coaching that helps them recognize areas of strength and need for teaching students with disabilities. Unfortunately, the amount, quality, and speed with which teachers receive feedback from coaches, administrators, mentors, or other instructional leaders on their academic and behavior management practices is limited. In this article, we describe a multimedia professional development option for documenting teacher practice, generating feedback, and delivering targeted instruction.

Keywords

multimedia, performance feedback, coaching, professional development

Students with disabilities (SWD) often benefit from placement in general education settings, or inclusive settings. Access to the general education curriculum and their peers can positively impact long-term outcomes for students with disabilities (Harber et al., 2016). When SWD are placed in general education classrooms with high quality instructional strategies (e.g., evidence-based and high-leverage practices), they often reap the benefits and can be successful. Thus, to best support SWD, it is important that teachers in multiple settings use evidence-based or high-leverage practices designed to support student outcomes. However, general educators often feel that they do not have the training or skills needed to support these students' intensive needs (Gable et al., 2012; Reinke et al., 2011). Thus, it is important that educators in multiple settings (e.g., general education, co-taught, self-contained) are given meaningful and data-based feedback that can improve their use of EBPs and HLPs.

Principals, coaches, and other instructional leaders are often limited in numerous ways when it comes to providing effective coaching and feedback to teachers (Sweigart et al., 2016). The same is true for teachers or those in training seeking to self-reflect on their teaching (Nagro et al., 2020). As a result, many teachers do not receive the quality and depth of feedback and ongoing support they may need to make improvements that would impact performance and behavior of students with disabilities (Cornelius et al., 2019). To address some of these barriers for observers, coaches, and teachers, research should focus on the development of coaching tools that enable observers to more readily complete

observation cycles, including providing teachers with meaningful data-based feedback.

What Do We Know About Effective Coaching?

Guidelines for Effective Practice

The State Implementation and Scaling up of Evidence-based Practices Technical Assistance Center ([SISEP] Cusumano & Preston, 2018) and National Center for Systemic Improvement (NCSI, 2016) draw upon principles of implementation science to provide a synthesis of research literature outlining coaching practices that have demonstrated evidence for improving teacher practice and student outcomes. The core components of the SISEP and NCSI guides are **a)** observation (Stormont & Reinke, 2012), **b)** modeling (Biancarosa et al., 2010), **c)** performance feedback (Cornelius & Nagro, 2014), and **d)** alliance building strategies (Wehby et al., 2012). When coaching is either missing or lacks the aforementioned essential principles for changing teacher behavior, knowledge, and skill on a lasting basis, students are negatively impacted. This is especially

¹ Department of Curriculum, Instruction, and Special Education, University of Virginia, Charlottesville, VA, USA

Corresponding Author:

Rachel L. Kunemund, Department of Curriculum, Instruction, and Special Education, University of Virginia, Charlottesville, VA 22903, USA.
Email: rk8vm@virginia.edu

true for students with disabilities. The new technology-based tool introduced in this article, COACHED (<https://coachedweb.azurewebsites.net/>), was designed to address these core components of effective coaching to enhance teachers' professional development.

What do we know about observations? Coaching (e.g., observations and follow up feedback) is a promising means of helping to improve teacher practice (e.g., Kraft et al., 2018), yet few schools have resources to provide teachers with such supports (e.g., a full-time colleague hired as a coach). Often, coaching within schools do not meet many or all of the mentioned SISEP and NCSI guidelines. Under-resourced schools in particular struggle to provide contextually relevant and tailored coaching supports to teachers in need (Cortina, 2011). Certain infrastructural challenges also thwart the progress of coaching programs. For example, coaches are often limited in access to observational instruments that provide detailed data on observed instructional and behavior management practices, without additional capabilities for monitoring changes in practice use over time (Reddy et al., 2017). With both measurement limitations and the inability to track progress over time, it can be difficult for coaches in these situations to conduct the meaningful observations recommended in the SISEP and NCSI models.

What do we know about modeling for teachers? According to the SISEP (Cusumano & Preston, 2018) and NCSI guidelines (2016), when used during a coaching program, modeling is an effective strategy for promoting the use of targeted strategies among teachers (e.g., Biancarosa et al., 2010; Kim et al., 2011). Modeling can be done by observers or coaches in-person or using technology-based options such as PD videos (Rodgers et al., 2019). The person doing the observation is often not in a strong position to understand the academic and behavioral needs of students with disabilities (Crockett et al., 2007). In addition, observers may encounter boundaries with regard to their own knowledge about evidence-based and other effective practices in various content areas, impacting their ability to provide meaningful feedback (Garet et al., 2011) and is therefore likely unable to skillfully model a strategy for the teacher.

What do we know about effective performance feedback to teachers? Sweigart and colleagues (2015) define performance feedback as using observation data to provide objective information about the lesson, to the greatest extent possible, to a teacher being observed. Effective performance feedback should be non-evaluative (Duchaine et al., 2011), and focused on improving implementation of specific practice(s) (Solomon et al., 2012). However, as noted above, instructional leaders and other supervisors are not always in strong position to deliver performance feedback because they lack (a) an observation instrument/ tool that aids in their collection of data, and (b) knowledge and skill for translating what they saw and data collected into meaningful messages the teacher can use. COACHED was created to help address both issues.

What do we know about alliance building in coaching? Although the role of coach can be played by any number of professionals in a school, several challenges to implementing and sustaining effective coaching programs have been identified. One example includes the narrow focus of coaching approaches, where teachers and students are only supported in specific content areas, single target behaviors, or individual student problems - rather than addressing interrelated, academic and behavioral concerns (Reddy et al., 2017). Though these issues exist, identifying the core, evidence-based components of coaching and weaving these areas of need with programs can potentially overcome challenges (Bradshaw et al., 2018).

Introducing COACHED

The purpose of this Technology in Action piece is to introduce a new technology-based suite of tools called **Capturing Observations And Collaboratively sHaring Educational Data** (COACHED). COACHED contains three key components intended to support self-reflecting teachers, administrators, instructional leaders, and teacher educators' work for providing feedback and support to teachers and those in training. The components are the Classroom Teaching (CT) Scan (Kennedy et al., 2017), performance feedback based on CT Scan data (Peeples et al., 2018), and content acquisition podcasts for teachers with embedded modeling videos (CAP-TV; Kennedy et al., 2016). Each component of COACHED works towards supporting effective coaching and high-quality performance feedback and teacher learning described in the SISEP (Cusumano & Preston, 2018) and NCSI (2016) by following a coaching cycle (see Figure 1) the components of which are described below.

COACHED can be used flexibly across age and grade levels given its foundation in theory and empirical literature around effective coaching, feedback, and professional learning. To see and test the functionality of COACHED with sample teacher coaching records, readers can log in to a test account by going to <https://coachedweb.azurewebsites.net/> and using the following credentials: Username: COACHED@test.com; Password: COACHEDtest.

Classroom Teaching Scan

The Classroom Teaching (CT) Scan (Kennedy et al., 2017) is a technology-based observational tool that allows the observer to collect objective real-time data on a range of academic and behavioral practices in the classroom. The low-inference nature of the CT scan enables the observer to collect detailed data on distinct teacher practices, student actions (e.g., engagement), and classroom contextual features (e.g., co-teaching models). Time-stamped data from the CT Scan are captured and uploaded within COACHED, automatically generating detailed, yet teacher-friendly feedback. The data from the CT Scan is used to generate two main forms of feedback: a detailed narrative (see Figures 2 and 3) and a visual timeline (see Figure 4) of the observation.

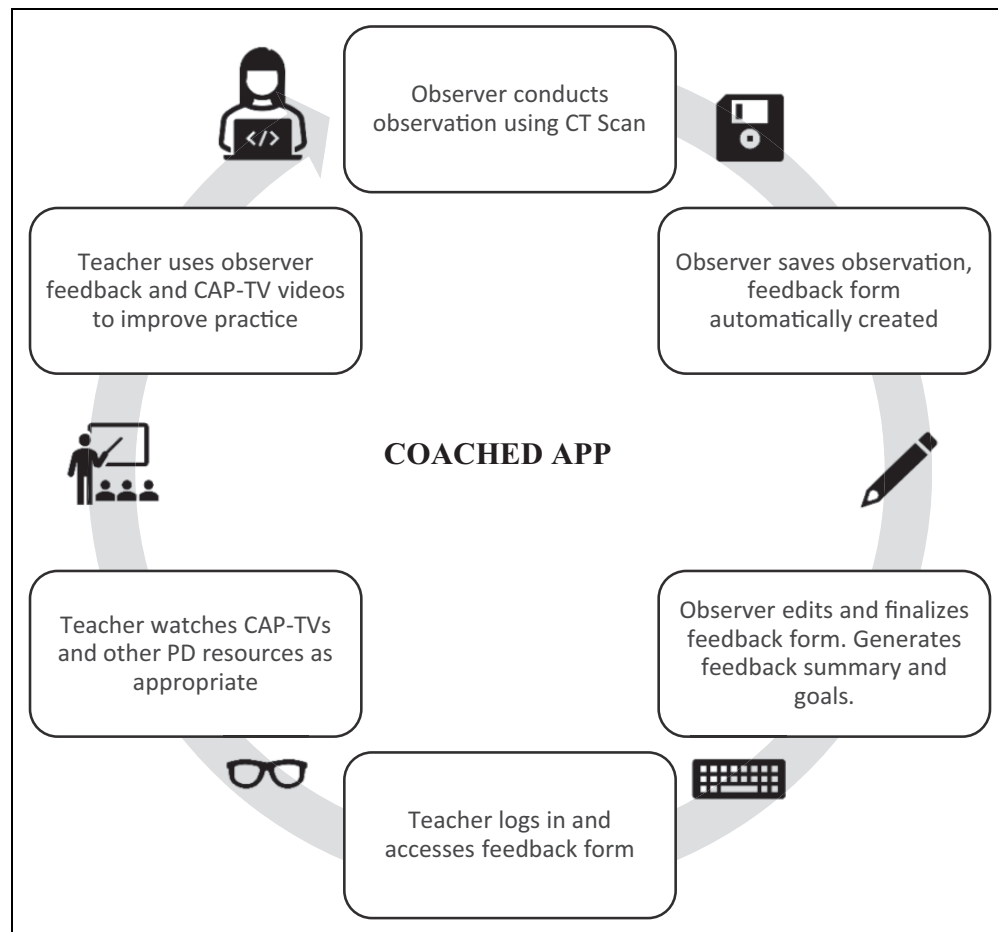


Figure 1. Typical coaching cycle with COACHED.

To use the CT Scan the observer begins by entering observation and classroom details into the registration form. Next the observer uses the main CT Scan interface (see Figure 5) to begin the observation and capture detailed information based on the lesson content. The observer selects the broad category being taught (e.g., vocabulary instruction, explicit reading instruction, behavior management), and then a specific teacher practice within the broad category (e.g., teaches/reviews expectations, uses contingency or reinforcer, active supervision). The observer can easily and quickly change categories and practices to match teacher moves throughout the lesson using the drop-down menu and confirming the new practice. The CT Scan automatically records the length of use for each category and practice. The observer can note the specific instructional topic and/or vocabulary being addressed at any given point throughout a lesson, this information is time stamped below the category and practice in the timeline. Finally, to monitor implementation fidelity, each practice has a list of implementation markers to select from as they observe these markers occurring (see Figure 6). Based in literature pertaining to each classroom practice, implementation markers describe specific teacher actions or “look-fors” during an observation. Whether each implementation marker is observed or not is used to

automatically generate the coaching feedback following the observation.

The CT Scan also allows the observer to simultaneously collect data on the number and types of discrete actions employed by teachers and students including: (a) opportunities for students to respond (OTRs; e.g., deep/probing questions, rote questions, choral, non-academic); (b) praise (academic-specific, behavior-specific, generic); (c) precorrection/prompts; (d) student behavior (e.g., disruptions); and (e) student-generated questions. As the observer selects each behavior, the CT Scan automatically tracks the number and time-stamp of each occurrence. The CT Scan interface also allows the observer to document the context of the teacher’s lesson by tracking the type of teacher (e.g., general or special educator), who the teacher is providing instruction to (e.g., individual student, whole group), co-teaching model, and visual aids being used (e.g., computer, graphic organizer). At the same time, the observer can also track student actions (e.g., listening, writing, group work) and the percentage of students who are engaged throughout the observation. Finally, the observer can record qualitative, time stamped notes for any additional information. All of these data are presented in a teacher-friendly timeline (see Figures 7 and 4) that overlays each observed item

Example(s) of term meaning Time Used: 5 minutes 30 seconds

☒ Clear Language ☐ Cues Instruction ☐ Explicit Explanation ☒ Uses Images ☒ Monitors Understanding ☒ Provides Feedback

Feedback Statements: **Opportunities to Respond:**

Breakdown: 3 total feedback statements at a rate of ~1 per minute	Breakdown: 5 total OTRs at a rate of ~1 per minute
3 generic feedback statements	4 rote OTRs
0 academic-specific feedback statements	0 choral/group OTRs
0 behavior-specific feedback statements	1 deep OTRs
	0 non-academic OTRs

Visual Aids Used during practice: **Student Action(s) during practice:**

☒ Picture/CPU ☐ Listening ☐ Answering Qs

Comments

When you were introducing examples I loved hearing the clear and easy to understand language!

One useful strategy to keep students on task and prepared is to provide them with cues to let them know what is coming next in the lesson. Images and verbal cues are a great way to this, let's try to include some cues in the next lesson.

One way to increase students' ability to grasp the content is to incorporate explicit language into your explanation, this makes the content clear and easy to understand.

I loved how you not only introduced an example of the term but also included images to go along with it, this is a great way to help students make connections.

You did great job monitoring understanding by providing your students with plenty of opportunities to demonstrate their learning through questions during the example. This is

Training Video

Effective Vocabulary Instruction: Using Examples and Non-Examples

from Michael Kennedy

10:52

A. Teacher practice that was implemented
B. Duration practice was used
C. Implementation markers observed (checked) and not observed (not checked)
D. Automatically generated feedback statements based on whether implementation marker was observed or not
E. Multimedia training video associated with practice used
F. Breakdown of types of feedback statements used during this practice
G. Break down of types of OTRs during this practice
H. Visual aids teacher used during this practice
I. Student actions observed during this practice

Figure 2. Feedback form feedback on practices.

(e.g., category and practice) with others that occurred at the same time (e.g., OTRs, student actions). The timeline output includes graphs that display a breakdown of teacher and student actions during the lesson as well as the counts and rates per minute of types of OTR, feedback, prompts, and student questions. Finally, these data are also used to automatically generate a narrative feedback.

Feedback Reports

Once an observation using the CT scan is complete, data is saved to a secure online database within COACHED and the observer can move on to the next phase of the coaching cycle (see Figure 1). Coaching feedback reports are automatically generated from the observation data, and the observer can use the online form with pre-populated fields to edit where needed (see Figure 2). COACHED automatically fills in information on the categories, practices, implementation markers, OTRs, feedback statements, visual aids, and student actions. The only additional writing components required of observers is a brief narrative summarizing the lesson and a description of “one big thing” to work on before the next observation. Providing detailed feedback a once time intensive process, now takes only a few minutes.

The feedback form displays, in chronological order, the categories and practices that were observed during the lesson

(see Figure 2). Since much of the feedback report is automatically filled in from CT Scan data this saves the observer/ coach copious amounts of time and reduces error. For example, detailed feedback sentences are automatically input into the feedback form based on which implementation markers were observed and not observed. By presenting the observation data in both the narrative feedback format and the visual CT Scan timeline, teachers get a detailed picture of what occurred during the observation.

The practices are displayed in individual boxes with associated data (e.g., duration of practice use). Below each practice in the box are the implementation markers. The automatically generated feedback for implementation markers are randomly selected from a comment bank to ensure the feedback is unique and not repetitive. Each implementation marker has several prewritten sentences for both observed and unobserved instances. To maintain the flexibility of the COACHED app, the bank of feedback sentences can be updated directly with in COACHED. Within each practice box, teachers will also see a breakdown of the number and types of OTRs and feedback statements used during that practice as well as visual aids used and student actions (e.g., taking notes, listening). Each practice box provides teachers and observers with an in-depth look at what was occurring during that practice.

Further, a section at the bottom of the feedback form for observers to provide a short, personalized narrative

Overview: A

Thank you for allowing us into your classroom to observe your vocabulary lesson today! During instruction you were teaching adaptations to survive. I like how you started the lesson out by reviewing key background information prior to introducing the student-friendly definition, this sets students up to make those meaningful connections right away. I noticed there weren't very many opportunities to respond, by constantly monitoring understanding through questions you can reinforce what students are learning and also determine who needs more support. You did a wonderful job using clear language that made it easy for students to follow along and understand. Keep in mind, images on the screen paired with text make for easier student learning, lets try to incorporate some more images when introducing the definition.

Goal for Next Observation: B

Goals for next time:

1. When using a student-friendly definition, monitor for understanding throughout by providing plenty of opportunities to respond (OTRs). You can watch the student-friendly definition video above around minute 15:00 for a modeling example.
2. Remember to use explicit cues when moving to a new strategy or section of the lesson, this helps students anticipate what they need to be doing. Check out the example/nonexample video for step by step directions around minute 3:55.

See you next time!

Total Feedback Statements:	Total Opportunities to Respond:
Breakdown: 5 total feedback statements at a rate of ~<1 per minute C 5 generic feedback statements 0 academic-specific feedback statements 0 behavior-specific feedback statements	Breakdown: 8 total OTRs at a rate of ~<1 per minute D 5 rote OTRs 1 choral/group OTRs 1 deep OTRs 1 non-academic OTRs

E Save Changes

F Download PDF

G Send Feedback Link To Teacher

A. Overview of observation feedback

B. Goals for teacher to focus on for next time

C. Break down of total feedback statements for the observation

D. Break down of total OTRs for the observation

E. Button for coach/observer to save changes to feedback form

F. Button to download a PDF of the feedback form

G. Button for sending the feedback link directly to the teacher's email

Figure 3. Feedback form narrative summary and counts.

summarizing the observation and setting goals for the teacher (see Figure 3). In this narrative summary, observers may also choose to reference multimedia PD videos, available next to each practice box and described in the following section, for practices where improvements are needed. The feedback form is also where teachers can directly access their CT Timeline for that specific observation. Additionally, total summary counts of types of OTRs and Feedback Statements are listed. While teachers can access their feedback via logging into their individualized COACHED accounts, observers also have the option of downloading a pdf of the feedback or sending a link directly to the teacher's email account. The entire process of generating and sending feedback has been greatly reduced, limiting the burden on observers. Additionally, the feedback does not contain a "quality" score and the observers rely on using observed data in generating the summary narrative. This style of data-based feedback enables the maintenance of a positive teacher-observer alliance.

Multimedia Modules

Following the observation of a teacher using the CT Scan and delivery of feedback, the final element of COACHED is to provide on-demand PD for areas of improvement.

CAP-TVs are multimedia modules developed to reflect Mayer's (2020) Cognitive Theory of Multimedia Learning and associated instructional design principles. This theoretical model and design principles and their relation to CAP-TVs are described elsewhere (Rodgers et al., 2017). The key is that the videos are short (5–15 min); and use rich images with accompanying key text to provide the user with a streamlined lesson on a specific topic or practice. The short in length allows teachers to engage with the PD easily and on their own schedule.

For example, this sample CAP-TV (<https://vimeo.com/448122821>) in part 1 (0:00-7:00) introduces key vocabulary and elements of a practice. Part two (7:01-end) shows a model teacher implementing the practice. CAP-TVs are assigned to

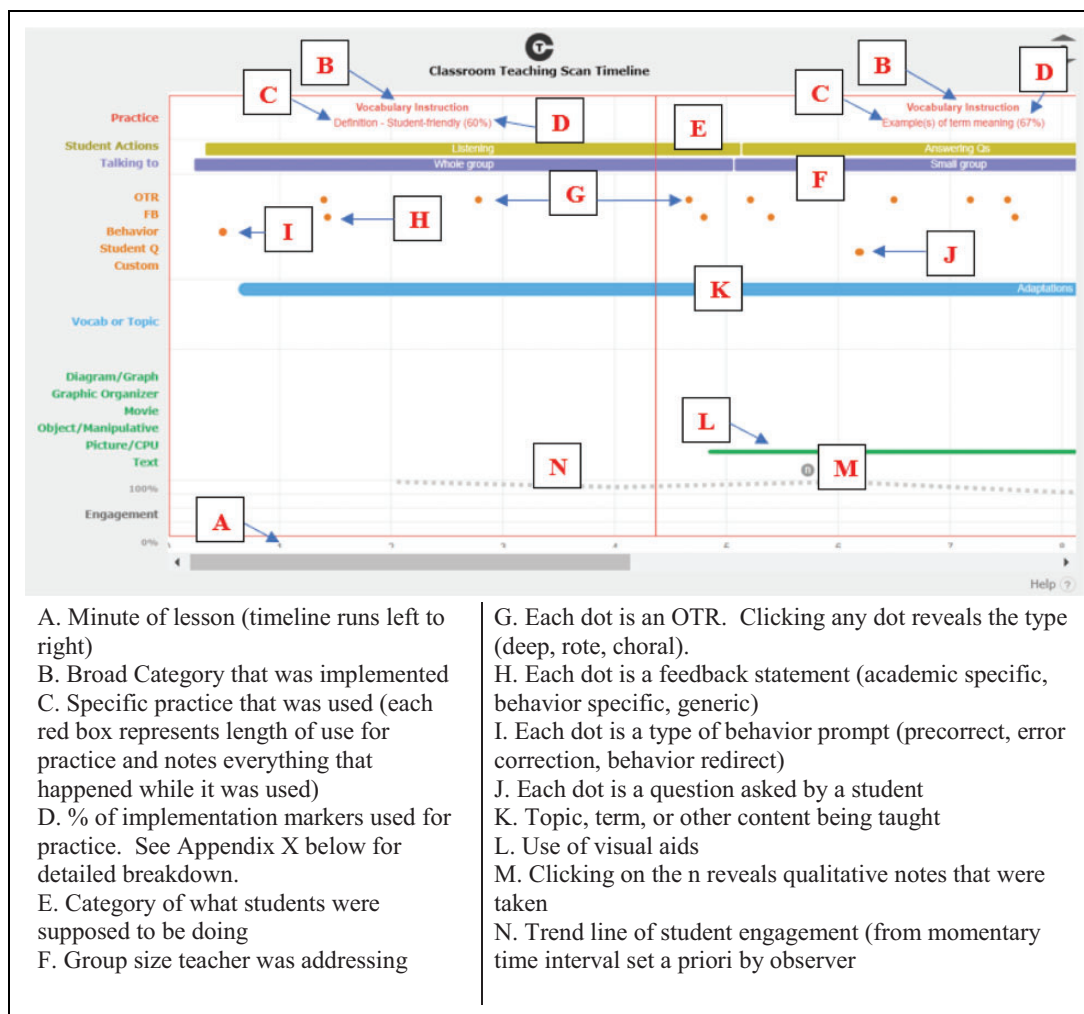


Figure 4. CT scan time line.

teachers within COACHED as an immediate opportunity to receive PD. The modules can also be posted elsewhere online or on course management sites.

Evidence for COACHED Components

The three core components of the COACHED app: the CT scan, performance feedback based on CT Scan data, and CAP-TVs have demonstrated effectiveness in improving both teacher and student outcomes. Kennedy and colleagues (2017; 2018) found, that when teaching vocabulary, inclusive middle school teachers of students with disabilities who were observed and received feedback using the CT Scan tended to use vocabulary instructional practices with increased frequency and quality relative to baseline and peers in other comparison groups (Kennedy et al., 2017, 2018). At the same time, both students with and without disabilities in these same classrooms performed better on curriculum-based measures of science vocabulary compared to their peers with and without disabilities in business-as-usual classrooms whose teachers did not receive CT Scan feedback and CAP-TV modeling. Recent

work also suggests that pre-service teachers who received CT scan feedback incorporated more explicit instruction practices into their lessons (Peeples et al., 2018). Teachers have also reported a preference for the objective and visual feedback from the CT Scan timeline and associated feedback forms as opposed to arbitrary quality scores and more subjective feedback (Kennedy et al., 2017, 2018; Peeples et al., 2018).

Content acquisition podcasts (CAPs) have been used with both pre- and in-service teachers with promising results. In a recent randomized control trial, Romig et al. (2018) found that pre-service teachers who used CAP-TVs vs lecture or reading demonstrate significant improvements in their writing instruction. Pre-service teachers also report a preference for CAPs, reporting overall satisfaction as well as their usefulness for teaching students with disabilities (Kennedy et al., 2014). CAPs are flexible and easily integrated into classrooms, and teachers have also been successful in designing and creating their own CAPs (Kennedy et al., 2014, Weiss et al., 2016). Finally, teachers who received training in the form of CAP-TVs have shown improvement in their use of evidence-based instructional strategies (Ely et al., 2015).

Set Vocabulary Instruction **A**

Definition - Student-friendly **B**

- None
- **Reviews Background Knowledge**
- Uses Images

- **Cues Instruction**
- **Clear Language**
- Monitors Understanding

Set new practice

Add Vocab Term or Topic: Type new term here **Add** **E**

Active term(s) or topic(s) (click to remove): **Adaptation**

F Deep Q OTR (3) **G** Rote Q OTR (6) **H** Chor/Grp OTR (1) **I** Non-Acad OTR (1) **J** FB Acad Specific (3) **K** FB Behav Specific (1) **L** Generic FB (6)

M Prompt Precorrect (2) **N** Behavior Redirect (1) **O** Error Correction (3) **P** Student Ask Q (5) **Q** # Student Asking Q (3) **R** Custom 1 **R** Custom 2

☐ Diagram/Graph **S** ☐ Object/Manipulative ☐ Graphic Organizer ☒ **Picture/CPU** **S** ☐ Movie ☐ Text **V**

Teacher: Special Ed **T** Talking To: Whole group **U** Co-teaching? 1-teach/1-assist **V**

Student actions: Answering Qs **W**

Type new note here **X** **Oops** **Send**

Done **Help ?**

A. Broad category being used by teacher
B. Specific practice being implemented
C. Implementation markers for practice (green observed, black not observed)
D. Time of observation (running clock)
E. Window to record content being taught
F. Count of deep, probing OTRs
G. Count of rote OTRs
H. Count of choral/group OTRs
I. Count of non-academic OTRs
J. Count of academic-specific Praise
K. Count of behavior-specific Praise
L. Count of generic Praise
M. Count of prompts or precorrections academic
N. Count of prompts or precorrections behavior
O. Count of error corrections
P. Count of questions asked by students
Q. Count of number of students asking questions
R. Custom buttons changeable at any time
S. Visual aids being used (check = active)
T. Visual aids being used (check = active)
U. Which teacher is being observed
V. Who teacher is talking to
V. Co-teaching model being used
W. What students are supposed to be doing
X. Window to take qualitative notes

Figure 5. Classroom teaching (CT) scan interface.

How COACHED Can Help Administrators, Coaches, Teacher Educators, and Teachers

Each component of COACHED helps to address the core components of effective coaching and professional development noted by the State Implementation and Scaling up of Evidence-based Practices Technical Assistance Center ([SISEP] Cusumano & Preston, 2018) and National Center for Systemic Improvement (NCSI, 2016). The CT Scan helps the professional conducting the observation capture the exact practice that was used and key ancillary data. The CT Scan is

superior to checklists or simple notetaking as it allows the observer to focus exclusively on the practice(s) being implemented, in addition to the overall fidelity of practice implementation. Additionally, with the ability to capture data from both academic and behavioral domains, the CT scan addresses the issue of the narrow focus of other coaching programs.

The performance feedback automatically generated by COACHED saves the observer significant time, and ensures educators being observed receive feedback on the practices they actually used. The reduced burden on observers can serve

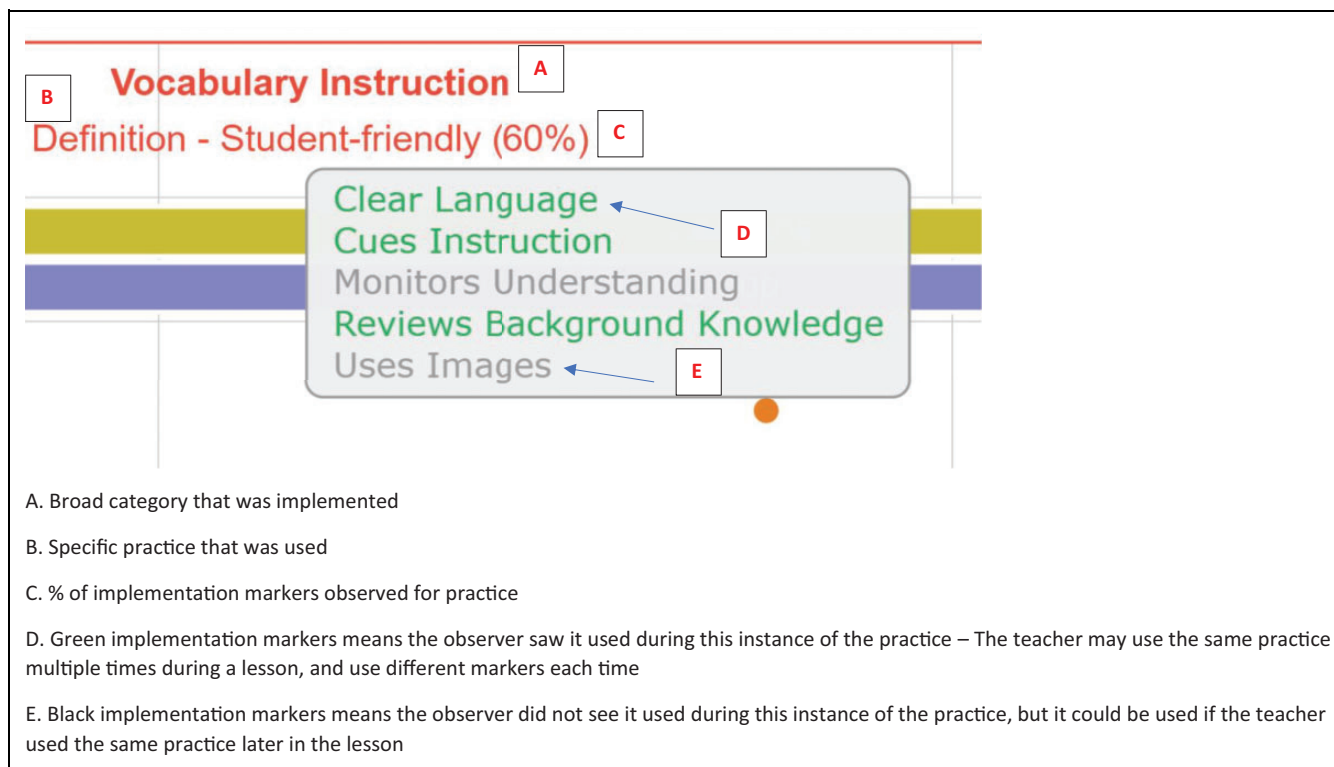


Figure 6. Detail of implementation markers.

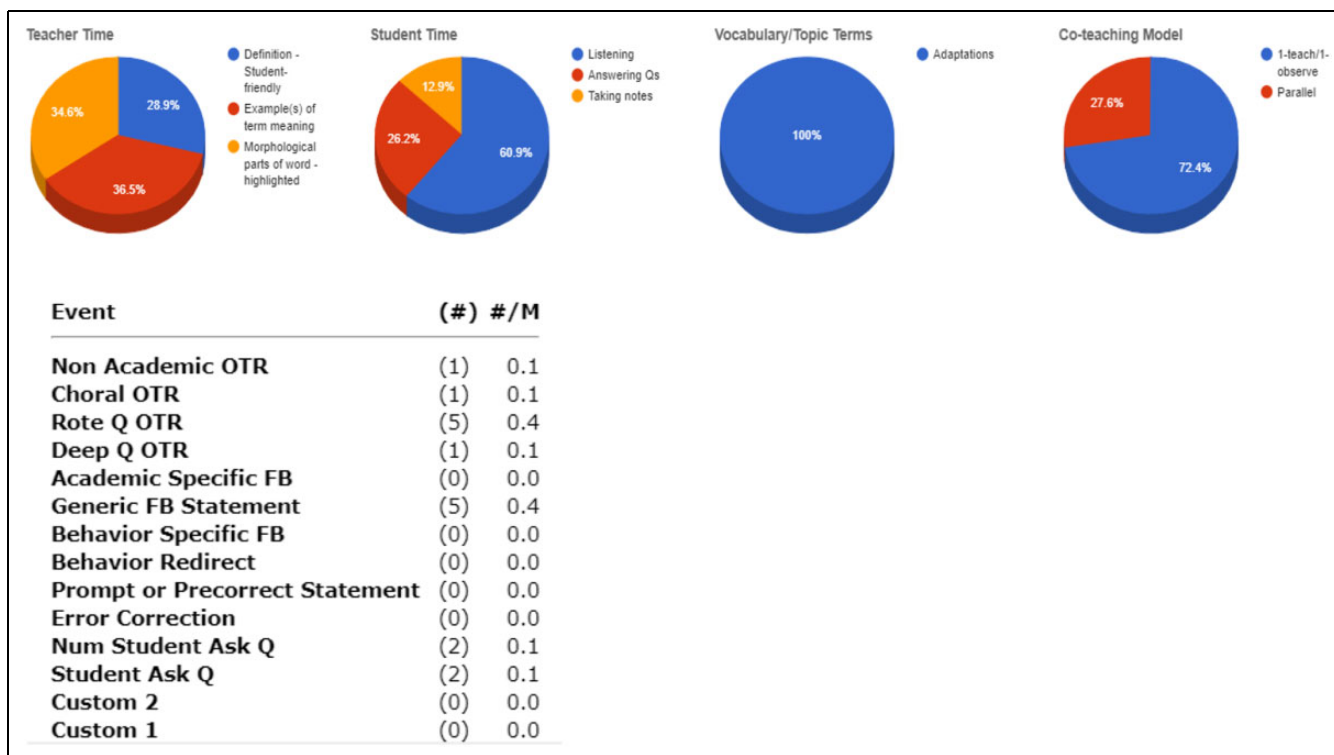


Figure 7. CT scan pie charts of how the teacher and students spent their time during the lesson, and raw counts of countable events during lesson including rate per minute.

as a benefit for schools who may be struggling with access to resources and personnel and have limited time to provide teachers with quality feedback. Recommendations in the SISEP (Cusumano & Preston, 2018) and NCSI (2016) also call for feedback that is presented in multiple formats (e.g., narrative, graphical, visual; Neuman & Cunningham, 2009; Snyder et al., 2015). The CT scan timeline and the coaching feedback form address this by providing teachers with feedback in graphical form (i.e. pie charts), a timeline visual format, and with written and numerical feedback.

As noted previously, quality feedback should maintain a focus on the implementation of specific practices rather than evaluation (Duchaine et al., 2011; Solomon et al., 2012), as this can help with the alliance between the observer and teacher when the teacher does not feel their practice is being judged (NCSI, 2016). The feedback generated from COACHED does not use an evaluative quality score. Rather, data are reported on the practices used and observers can use those data to provide teachers with summary feedback and specific goals for improvement.

Further, CAP-TVs provide teachers with on-demand PD that can be viewed when needed or desired, re-contextualizing the often disconnected format of typical PD sessions. These vignettes are relatively easy to create, and do not carry costs other than the time to create them. A library of free CAP-TVs are available at www.spedintro.com. The CAP-TVs provide teachers with on-demand modeling that they can access for targeted practices. New videos can be created by instructors or other leaders for specific practices or other topics of need.

Conclusion

COACHED is a free, multimedia option for administrators, coaches, teacher educators, and teachers of any grade level or content area to conduct observations, receive coaching, and on-demand PD based on specific data captured during lessons. The system is flexible in use, and customizable to suit a range of users' needs. A range of future research studies will help demonstrate the impact of this tool on various important outcomes for educators and students with disabilities.

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ORCID iD

Rachel L. Kunemund  <https://orcid.org/0000-0002-7126-8616>

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Author Biographies

Rachel L. Kunemund, PhD, is a project manager in the School of Education and Human Development at the University of Virginia. She manages the S4 OSEP Stepping Up Technology Implementation grant. A graduate from Virginia Commonwealth University, her research focuses on coaching programs, early student-teacher relationships and interactions, as well as student behavioral and academic outcomes for young students

Michael J. Kennedy, PhD, is an Associate Professor of Special Education in the School of Education and Human Development at the University of Virginia. Kennedy's main area of research is the design, implementation, and experimental testing of multimedia-based interventions to support pre- and in-service teachers' knowledge and implementation of evidence-based practices.

Lindsay M. Carlisle is a doctoral student in the School of Education and Human Development at the University of Virginia. Her specific research interests include improving outcomes for teachers of, and students with, emotional and behavioral disorders. Lindsay is interested in using multimedia learning tools to provide teachers with access to, and support with implementing, evidence-based practices to support the needs of students with disabilities.

Victoria J. VanUitert is a doctoral student in the special education program at the University of Virginia. Her research interests focus on the development of interventions to support scientific content and conceptual knowledge growth among students with high-incidence disabilities and enhancing teacher practices to further facilitate science achievement in these students.

Sean D. McDonald is currently a doctoral student in the University of Virginia School of Education and Human Development. His specific research interests include evidence-based practices in vocabulary instruction to support teachers and students with disabilities in inclusion settings. In addition, Sean is interested in research that addresses attrition and retention for special educators of color and implementing professional development for pre-service and in-service teachers that work in K-12 public school settings.