



Using Task Analysis to Support Inclusion and Assessment in the Classroom

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Mr. Keen is an experienced middle school special education teacher. This year, two of his students are enrolled in a seventh-grade science class taught by a general education teacher, Mrs. Rider. In their first meeting Mr. Keen introduces two students. Raul is a seventh-grade student with cerebral palsy that results in low tone in his core muscles and extremities. Specifically, Raul requires a wheelchair for mobility and an adapted stylus to write on a tablet. Raul also has cognitive needs including short-term memory loss and a mild intellectual disability. Drew is a seventh-grade student with autism spectrum disorder and moderate intellectual disability. Drew communicates with the support of an augmentative communication device that is frequently updated with vocabulary that can be applied to current topics. Drew will communicate with peers and adults when prompted and prefers to answer open-ended questions.

Supporting meaningful access to social and learning opportunities within general education classrooms for students with extensive support needs (ESN) is a persistent challenge for educators (Kuntz & Carter, 2019). Often, general educators have not had experience with evidence-based practices for students with disabilities or guidance on how to implement them in their classroom (Kuntz & Carter, 2019). Yet a substantial portion of students with disabilities, including ESN (e.g., intellectual disability, autism spectrum disorder, multiple disabilities), spend at least some of their day in general education classrooms (U.S. Department of Education, 2020). Students need to be taught using research-based strategies to make progress on appropriately ambitious individualized education programs (IEPs).

Opportunities to learn are influenced by a myriad of variables. Taub and colleagues (2017) identified four in particular for students with ESN: (a) access to grade-level standards-based curriculum content, (b) general education classes and other educational contexts, (c) established communication systems to engage in instruction, and (d) instructional materials and supports. One evidence-based practice that addresses these variables and can enhance opportunities to learn is a task analysis. Task analyses are not new for special educators (Gold, 1976); however, current

research, as will be discussed in the following, has evaluated innovative applications of task analyses to support learners with ESN in meaningful participation in learning opportunities in general education.

Task Analysis

A task analysis is a sequenced list of the subtasks or steps that make up a task (Moyer & Dardig, 1978). Task analyses can be used for a task that requires a series of logically ordered discrete skills. This is what separates them from checklists. Checklist items can be completed in any order without affecting the outcome. For example, students may use a checklist that guides in correcting punctuation, capitalization, and tense when editing their writing. Students can make corrections to a written document in any order using a checklist. However, many tasks in classroom settings require a series of steps to be completed in a specific order, such as solving a word problem. Students must first identify the type of problem they are solving, what is known and unknown, and then make and carry out a plan for arriving at the solution.

The field of special education has a long history with using task analyses to support teaching a variety of skills. Gold (1976) used a task analysis to teach students with ESN, including sensory impairments, to complete complex tasks. Gold divided the cyclical process of developing a task analysis into three phases: (a) identifying the method, or how the task will be performed; (b) defining the content, or how the method will be broken down into teachable components; and (c) determining the process, or the way the components will be taught and how progress will be determined. Our interpretation of this process is in **Figure 1**.

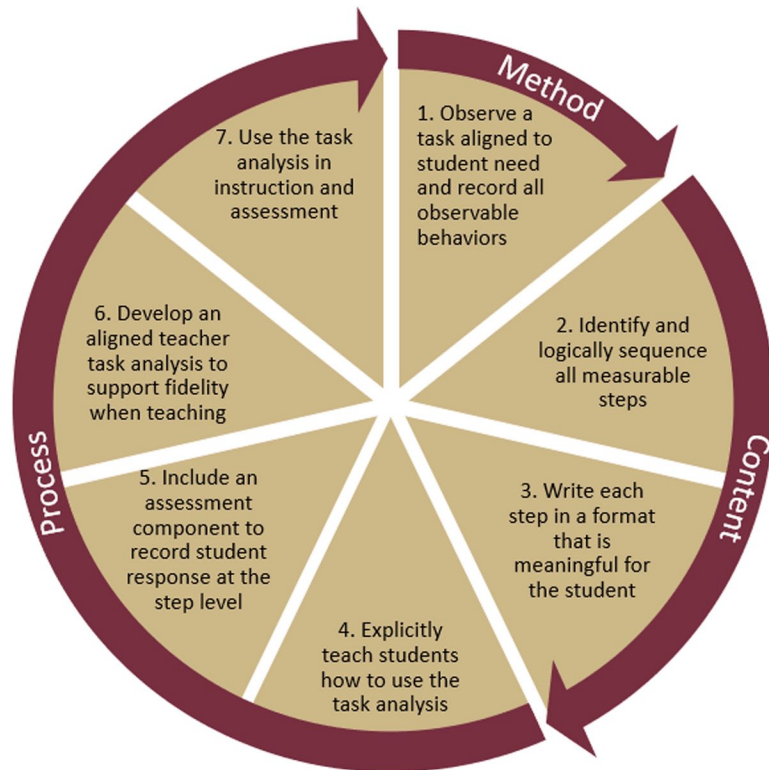
Common uses of task analysis include daily living skills such as handwashing, brushing teeth, or cooking, and multiple reviews have determined there is a sufficient quantity of high-quality research to classify task analyses as an evidence-based practice for students with ESN, including autism spectrum disorder (Steinbrenner et al., 2020) and moderate to severe intellectual disability (Spooner et al., 2019). Use of task analyses in the literature is multifaceted because it has been used both by teachers and students.

Task analyses can help teachers to plan opportunities for students with ESN to engage in the general curriculum in literacy (Browder et al., 2007; Mims et al., 2012), science (Courtade et al., 2010), social studies (Ryan et al., 2019), and mathematics (Browder et al., 2018). Students can use a task analysis as a visual activity schedule to support participation in routines with the general education classroom (Cohen & Demchak, 2018) and as a script to engage in inclusive social activities (Parker & Kamps, 2011). In addition, many other research-based interventions (i.e., video modeling, behavior skills training) use task analysis as a component of the treatment package.

A notable feature of recent research is student use of a task analysis to self-direct and self-monitor learning (Gilley et al., 2021; Root et al., 2018, 2020). For example, Gilley et al., (2021) taught young adults with ESN in a postsecondary transition program to self-monitor mathematical problem-solving using a two-column task analysis. After each step was completed, students checked off whether it was completed “by myself” or “with help.” Students graphed the data and set a goal for how many steps they wanted to complete independently the next day. Similarly, Miller & Taber-Doughty (2014) used a task analysis to increase the self-monitoring of middle school students with intellectual disabilities during an inquiry-based science lesson. Authors found that all participants increased their ability to complete steps in the science lesson independently and maintained the skill during generalization.

A task analysis is an efficient strategy for teachers and students because it streamlines the assessment and instruction process, allowing teachers to monitor and make decisions or changes to increase or decrease support and challenge. Finnerty et al. (2019) found general and special education teaching teams positively viewed instructional and assessment adaptations that were tangible, student-centered, and blended with classroom materials and instruction. In addition, teachers indicated adaptations were needed to support progress monitoring. Task analyses can support all students, create meaningful data for the whole class, and support inclusive education. Modern uses of task analyses to support students with ESN within academic tasks can lead

Figure 1 Cyclical process of developing a task analysis



Note. Based on Gold (1976), used with permission from McConomy et al. (2020)

to authentic and meaningful inclusion as students are given tools they need to self-monitor and self-prompt. As a result, a task analysis can become a natural support that is portable and nonstigmatizing. The purpose of this article is to provide guidance to practitioners on using two forms of task analyses to support meaningful access to academic opportunities within the general education classroom for students with ESN, one in a “student-friendly” format for students to use as a learning support and another for teachers to use to guide instruction and assessment.

Phase 1: Identify the Method for Completing the Task

Step 1: Observe a Task Aligned to Student Need and Record All Observable Behaviors

Rather than be used as a reactive support when students demonstrate difficulty, task analyses can be proactively used to support students with ESN to participate

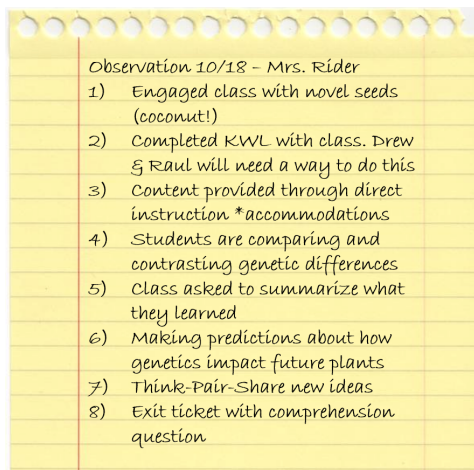
in the inclusive classroom (e.g., turning on computer and logging onto online learning management system, searching online for an image to represent a vocabulary word). The task analysis should reflect what peers are learning and doing and be linked to age- and grade-appropriate content. Special educators should collaborate to identify appropriate skills to teach using a task analysis. For example, the special education teacher can use knowledge of the student to determine the level of detail that is most appropriate while general educators provide input on the curriculum content.

Once a task that requires a chain of discrete skills has been identified, the special educator can begin the process of observation and recording all behaviors expected of students to complete the task or demonstrate the skill. These may be overt (e.g., typing numbers into a calculator) or private (e.g., identifying a math problem type by determining what type of operation is required). All steps should be recorded in a way that is observable and measurable in order to

allow for progress monitoring. Each step should show a change in the process (e.g., using calculator or manipulatives) or product (e.g., filling in a graphic organizer). This level of detail at the observation phase will support development of the student and teacher task analyses, teaching students to use the task analysis, and assessment of student progress. To remain student-friendly, the student version of the task analysis may not have the same level of detail as the teacher’s. Teachers should also note barriers that students encounter while completing the task; access to materials, individual needs, and prerequisite skills will need to be considered.

Mr. Keen observed a section of Mrs. Rider’s life science class in order to understand the expected student behaviors for engaging in an inquiry science lesson. Currently, the class is working on this Next Generation Science Standard: MS-LS1-5. Construct a scientific explanation based in evidence for how environmental and genetic factors influence the growth of organisms. Mrs. Rider explains

Figure 2 Mr. Keen's observation notes



the class will be growing a variety of plants from seeds and developing predictions about what factors contribute to observable differences in growth. The routine and expectations of engaging in inquiry are consistent across instructional units; students will use inquiry skills in this unit on plant growth that they used in previous units and will continue to use in the future. Both Raul and Drew will benefit from a task analysis during the current and future units. While observing the lesson on seed coats, Mr. Keen writes down the behaviors he sees the students engage in (see Figure 2) and makes notes of specific barriers Raul and Drew may encounter.

Phase 2: Define Content

Step 2: Identify and Logically Sequence All Measurable Steps

After observation, teachers should create an inclusive and sequential list of all the discrete behaviors required for the individual student task analysis. During the initial review of the task analysis, the teacher should consider each step in relationship to the steps that precede and follow it. The logical sequence is critical because each step of the task analysis will reinforce the step that precedes it, and the completion of each step signals the beginning of the next step. For example, in math, identifying the schema or problem type (Step 1) supports creating a schematic diagram (Step 2), which then

supports selecting the operation needed to solve the problem (Step 3).

Mr. Keen records the behaviors and steps he observed and adds details from the lesson plan. Mrs. Rider provides essential content information. Mr. Keen offers expertise on adapting the content for an individualized task analysis for both students and Mrs. Rider. For example, Mr. Keen breaks down the last step into two discrete skills for Raul and Drew. Raul and Drew will first develop an explanation by sharing something they learned and forming a prediction. Next, they will respond to a question that has been scaffolded to their strengths.

Step 3: Write Each Step in a Format That Is Meaningful for the Student

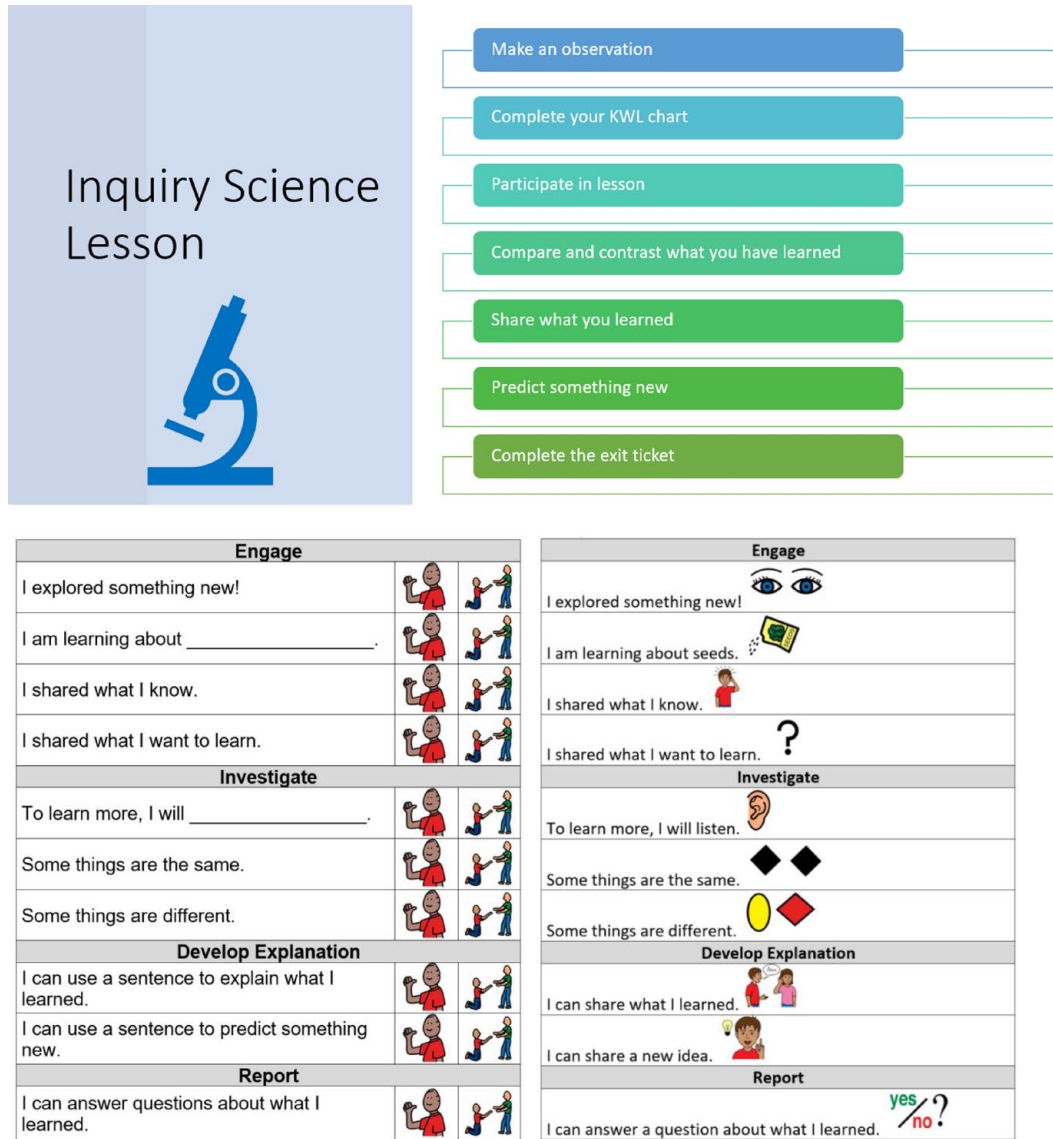
Once the steps for completing the routine or task have been identified and written in chronological order, teachers will need to determine the format for the task analysis. Elements to note include the way information is conveyed (e.g., words, combination of words and photos or symbols), how it will be accessed (e.g., electronic, laminated, paper-based), and the specific ways that students will engage in it (e.g., how will they self-monitor). Teachers should consider available resources, student preferences, and how often the student will engage in the task and need to use the task analysis. If the task analysis will be used frequently

during the day, a laminated task analysis that can be completed with a dry-erase marker or Velcro pull-offs may be the best option. Alternatively, using a printed paper for the task analysis allows teachers to use the completed task analysis as a permanent product for progress monitoring. The task analysis should be formatted to support self-monitoring, or the ability to observe and record behavior (Gilley et al., 2021). This can be accomplished in a variety of ways, including providing boxes for students to check off steps as they are completed (e.g., Browder et al., 2018; Root et al., 2020) or having students physically remove icons associated with each completed step.

It is important to consider generalization and maintenance during development because these phases of learning are when new skills truly begin to be meaningful (Shurr et al., 2019). Selecting skills students will have the opportunity to use over time will facilitate maintenance. Formatting task analyses so they provide enough support for students to use independently but are also applicable across tasks (e.g., multiple inquiry lessons) promotes generalization.

The way that task analyses are formatted (e.g., wording and visual symbols used) can support metacognition (Spooner et al., 2017) by giving choices with icons to indicate how steps are completed. In mathematics, students could circle a calculator or a manipulatives icon to indicate which method they used to arrive at an answer (Cox & Root, 2020). When reading a content area text, students could use signs for text connections by pointing to themselves to indicate a connection with a personal experience, make the sign for world (“w” with hands rotating in a circle) for connection with a current event, and sign for book (palms pressed together and opened like a book) for a connection to another text. This can address a barrier some students with ESN may face in inclusive classrooms when communicating or explaining how they arrived at an answer because that is an abstract process. Also, teachers should consider how complex each step should be for individual learners. Steps that are complex and involve more than one component may be too difficult and decrease engagement. Similarly, if the

Figure 3 Task analysis for (top) the whole class, (bottom left) Raul, and (bottom right) Drew



steps are broken down more than necessary, the student may be frustrated with the pace of instruction.

Finally, the task analysis will only be student-friendly if it aligns with the student's communication and symbolic communication level. The language and reading level of the task analysis should not become a barrier for the student. Task analysis should support independence (Miller & Taber-Doughty, 2014). How steps are worded and the visual supports that correspond with steps will need to match students' symbolic communication level. Symbols and icons need to make sense to the learner. **Figure 3** provides

examples of formatting for a task analysis that addresses these needs because they are designed to meet communication needs of students while being general and flexible enough to be used across all inquiry science lessons.

Mr. Keen shared his task analysis with Mrs. Rider, who determined that multiple students in her class may benefit from having more explicit expectations. Mrs. Rider designs a task analysis to display on the board that all students can copy onto their own paper. Mr. Keen then made individualized task analyses for Raul and Drew. Raul's task analysis was electronic and had open-ended questions

because he uses his tablet to write. Mr. Keen included options for self-monitoring whether steps were completed by himself or with help to address his IEP goal of completing academic tasks independently. Mr. Keen included more visual supports for Drew to address his literacy and symbolic communication needs.

Phase 3: Determine Process for Teaching

Step 4: Explicitly Teach Students How to Use the Task Analysis

Once the task analysis has been created, students will need explicit instruction on

how to appropriately use the task analysis to support their learning. One way to teach students to use a task analysis is explicit instruction (e.g., model, guided practice, independent practice; Archer & Hughes, 2011). Instruction begins by modeling the task analysis and corresponding skill to the student while the student completes each step after specific prompts from the teacher. During the next instructional period, the teacher can ask the students leading questions to encourage them to complete the steps with more independence. During this guided phase, the teacher should provide immediate error correction for any miscues. Finally, students practice the task analysis and associated skill with independence. Once the student uses the task analysis with mastery (does not skip steps, interprets each step accurately), a goal for mastery of the content objective can be set. It is important to separate the skill of using a task analysis from the task to be completed with the task analysis. A student may be able to use a task analysis with 100% accuracy (e.g., reference it as necessary, check off steps) but complete the actual task with 60% accuracy (e.g., make errors or omissions).

The teaching phase may also address other content needs. Students may be taught vocabulary used in the task analysis with constant time delay (McDonnell et al., 2020). Prior experience in using a task analyses may result in a student requiring less support in learning how to use it. Once task analyses are a part of a student's learning repertoire, they are adaptable to most instructional areas and will need less formal instruction for generalization.

Drew and Raul are provided direct instruction to learn how to use their task analysis for inquiry-based science lessons. During an individual lesson, Mr. Keen models how to use the task analysis using the evidence-based practice of explicit instruction. Mr. Keen provides a model, guided instruction, and an opportunity for independent practice (Archer & Hughes, 2011). Drew and Raul complete their task analyses with him and receive error correction and behavior-specific praise. Raul is becoming more independent with his task analysis, and he shows his science task analysis to his reading support specialist at school. She realizes this might help Raul complete the reading summary paragraphs independently and adds a task analysis that

Raul can use to find main ideas and supporting details and complete a summary.

Step 5: Include an Assessment Component to Record Student Responses at the Step Level

One benefit of using a task analysis is the opportunity for frequent, meaningful data collection. Task analyses allow teachers to collect assessment data on each step of the process. Task analyses can be modified to be utilized as data-collection sheets. Collecting data at the step level can inform what additional supports may be needed (Kellems et al., 2020). These data can be reported as a percentage of the task independently completed correctly. However, it is also possible to report many variations of the data using a prompting hierarchy. For example, the teacher can report that the student needs specific verbal prompts on 60% of the task analysis steps and completed the other steps independently. This helps teachers easily identify areas that need additional instruction and areas of mastery that can be used to scaffold new skills.

Using a task analysis for assessment provides a meaningful way for students to graph their own data and set realistic goals for their learning, which supports self-determination (Gilley et al., 2021). One style of task analysis that is conducive to data collection is an upside-down task analysis (Test & Spooner, 1996). In an upside-down task analysis, the first step is written at the bottom of the page, and data are graphed directly on the task analysis. This also allows the same data sheet to be used for several instructional sessions and facilitates visual analysis to make data-based decisions (Jimenez et al., 2012; Mims et al., 2012).

Mr. Keen knows that using a task analysis allows for frequent and detailed data to be collected. Mrs. Rider would like to use task analyses for all the students in the class to support learning and assessment. Mr. Keen has already determined the required steps for the task analysis, and Mrs. Rider makes a version of the task analysis for students receiving general education. Mrs. Rider has two students receiving general education that do not consistently independently remain on task during this class section and a student who needs support completing multiple steps independently. She will use an upside-down task analysis as a Tier 2 strategy as part of

their schoolwide multitiered system of supports and monitor progress.

Step 6: Develop an Aligned Teacher Task Analysis to Support Fidelity When Teaching

During the development phase, the teacher will determine if a task analysis will be created for the student, teacher, or both to use. When the student and teacher task analysis are aligned, it promotes fidelity during instruction and data collection. Using a task analysis for teachers extends the benefits of a task analysis to their instruction. This benefits classrooms where paraeducators provide instruction to students; a differentiated task analysis can be used for small-group instruction to support fidelity of implementation. Task analyses for teachers in content areas are beneficial for special education teachers who have limited training on grade-level content instruction. Evidence supports using a teacher task analysis to support systematic prompting in shared book reading (Browder et al., 2007). Teachers can include review steps and prompts for students. Using a whole class task analysis provides an opportunity for the teacher to note misconceptions that are consistent among students. Courtade and colleagues (2010) found that teacher implementation fidelity increased when using a task analysis for instruction during inquiry-based science lessons for students with intellectual disabilities. An example of an aligned teacher task analysis is provided in **Figure 4**. To develop a similar task analysis, teachers should begin with the steps developed for students and expand on the process needed to provide instruction at each step. Teachers can also note anticipated misconceptions or individual supports needed. These details can support all people who use the task analysis to provide instruction.

Mr. Keen develops a teacher task analysis to improve the fidelity of the science content instruction that Drew and Raul learn in Mrs. Rider's classroom. Mr. Keen plans to use the teacher task analysis in future inquiry-based science lessons.

Step 7: Use the Task Analysis in Instruction and Assessment

Task analysis can support different phases of learning, including acquisition, fluency,

Figure 4 Completed teacher task analysis for inquiry-based science lesson

#	Upside down teacher task analysis for inquiry-based science lesson – Mrs. Rider						
Task analysis step	Notes for this lesson	Gabby	Nevaeh	Tyler			
<i>Students were engaged, needed more support for what they wanted to learn</i>							
13	Use questioning to reinforce concept * Provide choice & support	<i>Exit tickets, differentiated</i>	R	R	M		
12	All students report their findings * Provide choice & support	<i>Product format choice, genetic variations in plants...</i>	OT	R	M		
Report							
11	Discuss methods to test explanation	✓	Teacher task analysis for inquiry-based science lesson - Mr. Keen				
10	Guide students in forming an explanation	✓	Engage	Notes for this lesson	Anticipated response	Drew	Raul
9	Make explicit connections to prior learning	✓	Provide samples of material, pictures or models	<i>Lima beans, plant life cycle models?</i>	<i>Look & touch bean</i>	VP	VP needs support
8	Explain known knowledge to current activity	✓	Ask student to define item * Provide leading support	<i>Seed definition card, plant example, non-example cards</i>	<i>Select seed definition from field of 3</i>	IC	IC
Develop Explanation							
7	Ask students to identify what is different (consider characteristics)	✓	Ask student what they know about the item * Provide leading support	<i>Seeds grow into plants</i>	<i>Sort examples and non-examples of seeds</i>	IC	VP
6	Ask students to identify what is the same (consider characteristics)	✓	Ask students what they would like to learn * Provide leading support	<i>Offer choice cards, seeds we eat, big seeds. Add to AAC</i>	<i>What do seed become?</i>	VP	VP
Investigate							
5	Ask students how we can learn more (consider characteristics)	✓	Ask students how we can learn more * Provide choices, guide with questions	<i>Provide books about plants & website for local nursery</i>	<i>"ask" need to address who/where</i>	IC	IC
4	Ask students what they would like to learn * Provide leading support	✓	Ask students to identify what is the same (consider characteristics)	<i>Seed sort, all have seed coats, and food for plant embryo</i>	<i>we eat all seeds - misconception</i>	VP	VP
review							
3	Ask student what they know about the item * Provide leading support	✓	Ask students to identify what is different (consider characteristics)	<i>Some float, some travel, some are food for animals</i>	<i>big & small, Drew can expand</i>	IC	IC
Develop Explanation							
2	Ask student to define item * Provide leading support	✓	Explain known knowledge to current activity	<i>Plants are living things that grow and change</i>	<i>Plants grow/change size</i>	VP	VP
1	Provide samples of material, pictures or models	review	Make explicit connections to prior learning	<i>Plants grow from seeds, review sprout in bag</i>	<i>seeds make plants, help for expanding</i>	IC	SVP
Engage							
	Discuss methods to test explanation	✓	Guide students in forming an explanation	<i>Use sentence starter and/or cloze with key words provided</i>	<i>different seeds = different plants</i>	sentence starter IC	close IC
Report							
	All students report their findings * Provide choices and support	✓	Discuss methods to test explanation	<i>Plant 2 different seeds, grow 2 different plants</i>	<i>"test" vocabulary could be barrier</i>	VP	VP
	Use questioning to reinforce concept * Provide choices and support	send home		<i>Template provided with supported vocabulary provided</i>	<i>Singles statements, support to connect ideas</i>	VP	SVP
				<i>"Why do seeds have different characteristics?"</i>	<i>Grow different plants</i>	IC	IC

P – participating R – review needed O

IC – independently correct VP – verbal prompt SVP – specific verbal prompt AP – answer provided

maintenance, and generalization. As students progress through phases of learning, the format of the task analysis and way it is implemented may change. For example, in the acquisition phase, the student may need a more explicit task analysis that is broken down into discrete components. During acquisition, a student may need frequent prompting and reinforcement. To facilitate moving into fluency, the student should be reinforced for completing steps independently as well as at an appropriate rate for the task and their age. Reinforcement might be thinned and contingent on a set criterion, such as 80% independence or completion by the end of the class period. For example, during initial instruction, behavior-specific praise may be offered after each independently completed step. As data reflect an increase in independently correct responses, the teacher may thin the reinforcement by providing behavior-specific praise after the student has completed two or more steps in succession independently correct.

When students are focused on maintenance of skills, they may not need the same task analysis. For example, research in mathematics found middle school students with ESN were able to use a modified and simplified task analysis after they had mastered a skill (Cox & Root, 2020). The format of the task analysis can also support generalization across settings and content areas, especially if it is portable (e.g., on an electronic platform or durable format). Some students with ESN may not need a task analysis to generalize skills once they have demonstrated mastery in the target context (Root et al., 2020). Task analysis can be implemented by many people in the educational environment who support and teach the student (e.g., general education teacher, special education teacher, paraprofessional, peers). Furthermore, the home and school partnership can be leveraged to support the learner because caregivers can work with school staff to create a task analysis to use when doing homework, further promoting generalization.

Special education teachers are required to frequently report student progress toward IEP goals. When using a task analysis during instruction, the teacher and student produce valuable data in each session, making the assessment process authentic and efficient. This reduces the time that a teacher may otherwise spend administering assessments to meet the progress reporting requirement. These data can be reported as part of the IEP goal progress and used when writing present levels of performance statements on annual IEP reviews. It is beneficial to use task analysis data because it is collected frequently during the unit and during instruction, not only in an assessment format. These data can support writing measurable, specific goals, which is a requirement for IEP teams. Relatedly, the data can be used to make changes to the task analysis either by increasing support or increasing challenge.

Writing and using a task analysis for teaching and assessment is an iterative process. This was established by Gold (1976): The revision process of task

analysis can be extensive but supports independent learning. Discrete skills on the task analysis can be combined as students show mastery or further broken down based on student need. This process should be completed frequently and on an individual basis. Using a task analysis to support these instructional choices allows educators to make data-driven decisions based on student strengths and needs.

Mrs. Rider has used the task analysis during four instructional periods this week. She shows Mr. Keen the graph the students have made with peer support. Mrs. Rider noted on her task analysis that she often provided characteristics of plants and genetic differences and that she needs to allow more wait time. Mr. Keen noted that Drew was showing growth by increasing the number of steps he independently mastered but that in every session he required a specific verbal prompt to share what he learned. Mr. Keen decides to break that step up into additional steps. Raul is not completing the steps in order, and the paraprofessional thinks the reason might be that the task analysis scrolls on his tablet. Mr. Keen changes the format of the task analysis to only present one step at a time and includes a recording of the step being read aloud. Mr. Keen uses these data from the life science classroom to write Raul and Drew's eighth-grade IEP. Their success and independence support the placement in Mrs. Rider's science classroom and that an additional general education classroom be added to their schedule, American history. Mr. Keen can identify their academic strengths and needs related to inquiry-based instruction and what prompting strategies were most efficient in changing academic learning.

Conclusion

Task analyses are useful to both teacher and students across multiple settings, including in general education classrooms for students with and without disabilities. They can be tailored to enhance independence in any setting where the student is learning something new. The cyclical process of developing and implementing task analyses should be individualized to the context and needs of students and used to make data-based decisions. Although this instructional strategy is not novel to the field of special education (Gold, 1976), educators may want to consider task analyses through a new lens because it can be a tool to

support independence and progress in inclusive general education settings.

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