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Strategies for Collecting Data in Physical Education

by Kimble B. Morton and Lauren J. Lieberman



Assessment is the key to developing an effective program and tracking the progress of each individual student. In turn, the pillar of assessment is collecting accurate, objective data. With ample, accurate data, we are much better prepared to answer significant instructional questions: Is the student making progress? Did this lesson achieve what I wanted it to achieve? Did all students in class have the same amount of practice this month? Is one type of lesson more effective than another? How many students are making progress on a particular skill? Do I need to continue to focus on this skill or should I shift to another skill? Collecting data is a crucial activity of any physical education teacher, but especially those who teach students with a disability.

Importance of Collecting Accurate Data

Physical educators need to be accountable for the instruction and learning of students. A good rule of thumb is to have three forms of documentation to support assessment of student performance and instructional practices. The law requires at least two assessments for placement (IDEA-IA, 2004). Additional information is needed to effectively develop programs for individual children (Auxter, Pyfer, Huettig, 2005; Lieberman & Houston-Wilson, 2002). Forms of documentation can include the following: (a) a portfolio of student work samples (e.g., written tests, fitness scores, written work, photos of the student demonstrating a motor skill); (b) the teacher's written record of tested progress on individualized education plan (IEP) goals and objectives; (c) results of formal testing, daily or weekly notes or log (which can also be sent home to parents and returned); (d) direct measurements (e.g., height and weight, or caliper measurements of body fat) or teacher-made skill tests or observational checklists. Having three forms of documentation not only provides for cross-validation (ensuring that what is being taught is what should be taught), but also proves beneficial if the teachers choice of instruction is called into question.

Barriers to Efficient Data Collection

Although assessment is an integral part of a physical educator's job, there are numerous barriers that may impede collection of information throughout the process. It is extremely hard to observe, teach, and document improvement. Below are just a few of the barriers.

Not enough trained staff. Physical educators often point to the issue of not having enough staff to assist in data collection. Teachers can do only a certain number of things at one time. It is very difficult to instruct, give feedback, and individualize lessons while simultaneously observing movement quality, counting the number of performances that meet criterion, and/or timing the speed or duration of a performance. Additional staff members trained to collect data are often crucial to this endeavor. Such staff could consist of trained paraeducators, peer tutors, field experience students, volunteers, and parents and grandparents.

Not enough time. Accurate data collection takes time before, during, and after class (Hastad & Lacy, 1998). It takes time before class to learn about and practice data collection procedures. During class it takes time to collect data for individual students. After class it takes time to organize, tabulate, and analyze the information. Even a single additional assessment procedure contributes to the time barrier, not to mention taking time away from teaching.

Not knowing what data to collect. Many teachers are truly at a loss in terms of knowing exactly what to assess, and that makes it difficult to know what data to collect. State and national standards cover a wide swath, from fitness to community resources, safety, skill development, and the affective domain. Which is most important? Which provides data that can be aligned with the current curriculum? These basic questions must be answered before anyone, especially new teachers, can make progress in the assessment process.

Formal or traditional types of assessment tools are designed to provide effective data for screening and

placement. Yet, they are difficult to use in a class setting or as an ongoing procedure. An alternative is to create authentic assessments that contribute to the curriculum. The result is meaningful evaluation that is related specifically to what students are learning. However, creative or alternative data collection procedures must be designed carefully, so they lead to valid assessment. Refer to the resources at the end of this article for additional guidelines and samples of authentic assessments and rubrics.

Strategies for Collecting Assessment Data

There are a variety of ways to overcome the barriers described above. *Planning for data collection* is the key. Taking time to think about data collection before starting usually saves time and results in useful data. The following questions are offered to assist in planning for data collection.

1. *What do you want to know?* Identify key components of the curriculum to be assessed (Wright & van der Mars, 2004). Some data that physical educators need is fairly straightforward, such as finding out how close a student is to meeting a fitness goal. Sometimes it is a bit more complex. For instance, a teacher wants to know if Jimmy's new peer tutor is praising him as often as the last

one did. What assessment documentation would answer that question?

2. *What do you want to count, time, or observe in order to document a student's performance?* Counting the number of correct responses is only one way to garner data on student accuracy. But what if the question is more complicated, such as why a student doesn't seem to be benefiting from practice. Recording time on task might be more helpful. A high rate of on-task behavior without a commensurate increase in ability may require an analysis of content delivery, comprehension, and memory. Such information may suggest a change in the way information and instruction is delivered.
3. *Who is available to collect the data?* Look for other adults (e.g., paraeducators, parent volunteers, student teachers, etc.) who can be trained to collect data. There are several programs that train non-professionals to assist with data collection. See Table 1 for suggestions on how to utilize paraeducators for data collection. Students may also be able to record some of their own data if given a small amount of training. Many students can count movements, such as curls or push-ups, and circle a number on a prepared name card at an activity station.
4. *Is there sufficient equipment to facilitate data collection?* For example, as students work on throwing

TABLE 1—Data Collection Methods That Can be Utilized by Paraeducators

- **One-to-one**—The student with a disability can be observed by the instructor or the paraeducator on a 1:1 basis.
- **Small group**—The paraeducator can be responsible for collecting the data for a small group of students in the class. Students in the group may have a disability, but all do not have to have a disability. It is just easier to work with a group of students with similar abilities (e.g., pull-ups)
- **Entire class**—The physical educator may expect the paraeducator to assist with collecting data of the entire class. For example, the class may have a timed swim and the paraeducator is asked to do the timing or record the number of laps for each student.
- **Stations**—Assessment stations may be spread throughout the gymnasium or other outdoor area. The paraeducator may be asked to record data at one or two specific stations.
- **Peer to peer**—The students may be asked to record data for each other. The paraeducator may monitor the data collecting of the peers, answer questions and ensure they are collecting data correctly.
- **Collecting/distributing portfolios**—If the class uses portfolio assessments, the paraeducator may be asked to distribute and collect portfolios and assist students with recording data in their portfolio.
- **Electronic data recording**—Many schools record assessment data on a PDA (personal data assistant) for ease of interpretation. If your school uses a PDA, the teacher can instruct the paraeducator on how to record data using the device. In other cases, data recorded with pencil and paper may be transferred to computer software by the paraeducator.
- **Videotape**—The paraeducator may collect data by videotaping the class or particular students.
- **Checklist or Rating Scale**—The teacher may explain the performance criteria and provide a checklist of performance criteria for the paraeducator to record observed performances.
- **Rubric**—The paraeducator may be given a rubric to follow while observing each level that is accomplished and recording performance.
- **Description**—In some cases, students may not be able to be assessed using pre-determined criteria. They may have either a severe behavior disability or physical disability, or both. In this case, it may be easier to describe the student's performance relating to a specific area of assessment.

at a target, give each a set of 5 beanbags to throw into their own bucket. When finished, they place a card with their name on it in the bucket. After class, the teacher counts the bean bags in each bucket as a quick assessment.

Taking the time to teach students to record their own performance is well worth it. Not only does it enhance data collection, it is also a skill students can use to monitor their own fitness programs as they grow up. Self-assessment is extremely motivating, as well as holding students accountable for learning. Therefore, providing opportunities for them to mark their own data becomes a valuable source of feedback.

Match the data collection strategies to the setting.

Counting and recording responses or repetitions can be done in many different ways. Select the one that best fits your setting. For example, students can move their name card to a *finished* box after they complete each station of a fitness course. Since that won't work for swimming laps, counting for oneself and calling it out to a peer recorder might be a better option.

Timing does not always need to be continuous. For example, collecting data on *attention to task* can be overwhelming if you use a stopwatch to measure the time between lapses in attention. But, you can still get useful data on the attention of a whole class by looking around every 5th minute and recording the number (or names) of students who are off task. Of course, this is something a trained student helper or adult volunteer may be able to do as well.

Collect data on your own behavior. Case in point: For a student you would like to see increase his or her ability to work independently, it's useful to record the

number of prompts you give that student. Again, a little planning goes a long way. Come to class with a bunch of small objects (pennies, marbles, dried beans) in one pocket. Each time you prompt the student, put one of those tokens in your other pocket. After class, count the tokens to determine how many prompts you gave. The goal over time would be to give fewer prompts, indicating increased independence. Of course, moving tokens from one pocket to another can be used to count just about anything: laps, repetitions, accurate throws.

Use detailed, curriculum-specific rubrics to record achievement at regular intervals. Rubrics are detailed assessments that describe measurable and observable levels of accomplishment. Knowing what level of the rubric a child has achieved helps that student, the teacher, and other helpers understand what to work on next. The rubric, in essence, gives continuous, formative feedback. See Table 2 for an example.

Focus on one student per day for data collection. This seems obvious if you are moving tokens from one pocket to the other. The reality is that the teacher is often the only one available or qualified to count, measure, or time certain things. However, if there is a need to count the responses or behaviors of a group of students, one strategy is to target one student a day for data collection. In a given class, this may mean recording data for key students every few weeks. For instance, if six students in a class that meets twice a week are not improving as expected, data on each student could be collected every three weeks. Or, to cut that time in half, and depending on the nature of the problem, collect data on one child at a time for a *portion* of the class time.

Be creative and share strategies with others. Below are additional ideas that have been used to collect data in

TABLE 2 —Jump Rope

Task	Jump rope
Task description	Student can perform the act of rolling, walking, hopping, or jumping over a rope at any height
Scale components	(a) number of jumps, (b) direction of jumps
Rubric level & color	Rubric descriptors
1- red	Student can crawl, roll, walk, jump over a rope placed up to 1 foot off the ground.
2- orange	Student can step or jump forward over a rope placed 1 foot off the ground, either stationary or swinging.
3- yellow	Student can bring rope over head with arms and step or roll over rope once.
4- green	Student can bring rope over head with arms and step or roll over rope 2-20 times.
5-blue	Student can jump rope, swinging rope over head 1-20 times.
6-indigo	Student can jump rope to music forward, backward, crisscross, for 1-5 minutes.
7-violet	Student can jump rope to music, either alone or with a partner, for 6-20 minutes.

Specific adaptations from Lieberman & Houston-Wilson (2002)

TABLE 3—Index Card Assessment Example: Locomotor Skills

Name	Gallop	Jump	Slide	Leap
Marco	2 elements 10'	4 elements 2'	1 element 5'	2 elements 3 x in a row
Tanya	Did not try	4 elements 3'	3 elements 10'	4 elements 5 x in a row
Ricardo	3 elements 20'	4 elements 2.5'	3 elements 10'	4 elements 3 x in a row
Jillian	1 element 5'	2 elements 2'	1 element 2'	2 elements 2 x in a row
Keenan	4 elements 15'	4 elements 4'	3 elements 15'	4 elements 5 x in a row
Tywan	2 elements 3'	2 elements 2'	Did not try	1 elements 1 x in a row

physical activity settings. These work for young students or students with a disability, as well as others.

- Each time a criterion is met, direct the student to put a sticker on a chart or marble in a container, etc.
- If students can write, or even make a mark, they can probably make one mark per square on an enlarged grid. Working in small groups, they can often help each other with this task. Even if a student is unable to understand the data sheet itself, the act of making a mark to signify some type of achievement is a positive self-reflective behavior. Further, the chart can be included in a portfolio assessment.
- Keep an index card and golf pencil handy (shirt pockets work well). Prepare a grid (rows or columns) on the card with student initials and events to count or score. This allows for a quick record that can be transferred later to a score sheet, graph, or other document. See Table 3 for an example.
- Use a mechanical wrist counter. It can be worn like a wrist watch and operates with a push button.
- Carry a small tape recorder and observe three to five students at a time. With the recorder on, give positive specific and corrective feedback to the students, making sure to include their first names. This provides qualitative data that can be referenced later.

Summary

It is important to collect accurate data on student performance in order to be accountable for the instruction and learning of students. Although barriers sometimes impede data collection, they can be overcome through

strategies such as (a) planning, (b) matching collection strategies to the setting, (c) recording your own behavior, (d) using specific rubrics, (e) collecting data on one or two students a day, (f) training and directing paraeducators, (g) teaching students to self monitor, and (h) utilizing simple equipment to record data. Once accurate and sufficient data is collected, placements, planning, modifications, instruction, and feedback are easier, more valid, and effective.

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- Lieberman, L.J., & Houston-Wilson, C. (2002). *Strategies for inclusion: A handbook for physical educators*. Champaign, IL: Human Kinetics.
- Wright, M.T., & van der Mars, H. (2004). Blending assessment into instruction: Practical applications and meaningful results. *Journal of Physical Education, Recreation, & Dance*, 75(9), 29-34.

Resources

Web sites

- www.a-ape.com
- PE-Central-APE:
www.pecentral.com/assessment/assessment.html
www.pecentral.com/adapted/adaptedmenu.html
- www.achieve.org
- www.TWU.edu/INSPIRE-
 Project INSPIRE gives wonderful up to date information about adapted physical education, adapted aquatics, assessment, and many, many disabilities

Books

- Burton, A.W., & Miller, D.E. (2004) *Movement skill assessment*. Champaign, IL: Human Kinetics.
- Schiemer, S. (2000) *Assessment strategies for elementary physical education*. Champaign, IL: Human Kinetics. ©