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Design and Use of Task Cards in the Reciprocal Style of Teaching

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DESIGN AND USE OF

Task Cards *in the* Reciprocal Style of Teaching

PETER ISERBYT
MARK BYRA

Easy to create and implement, task cards support student learning in various content areas.

TASK CARDS combine a picture of a skill to be learned with written instructions about how to perform the skill. Because of the combination of words and pictures, they are considered multimedia instructional tools. Task cards are usually oriented in landscape view and fit the size of a page in regular text-processing programs. Although the physical education literature has often described the use of task cards (Barrett, 2005; Block, Oberweiser, & Bain, 1995; Byra, 2004; Dyson, 2002; Iserbyt, Madou, Vergauwen, & Behets, 2011; Johnson & Ward, 2001), only recently has their design received attention in peer-learning research (Iserbyt, Elen, & Behets, 2010). Since task cards are usually implemented to complement teacher instruction, their design is of utmost importance for student learning. The cognitive theory in multimedia learning (Mayer, 2005a) provides a scientific framework for designing task cards for student learning based on human cognitive architecture.

Cognitive Theory in Multimedia Learning

Delivering instruction in ways that facilitate student learning is a core goal in the field of physical education. It is hypothesized that instructional tools developed in light of how the human mind works will lead to higher learning gains than tools that are not. The cognitive theory in multimedia learning (Mayer, 2005a) explains how people learn from multimedia instructional tools. Three assumptions underlie this theory. First, the human mind has two separate channels (auditory and visual) for processing instruction. Second, the auditory and visual channels have limited processing capacity. This means that when too much information is given, a large amount gets lost due to cognitive overload. Finally, people process information (learn) in an active manner. This process involves

selecting relevant information such as words and pictures on task cards, organizing those words and pictures in working memory, and integrating this new information into long-term memory.

This theory has been used to generate research-based guidelines for the design of task cards with the main goal of lowering the cognitive load attributable to instructional messages, thereby leaving more space in the working memory for solving the learning task. Task cards designed according to these guidelines foster learning and reduce instructional time (i.e., the time necessary to make sense of the instructions presented on task cards). Although these guidelines primarily originated from research with cognitive tasks, it is assumed that they can be generalized to psychomotor tasks. Examples from the motor area are provided next to help clarify the task-card design principles.

Task-Card Design Principles

This section presents six principles for designing task cards based on cognitive theory. The application of these principles fosters student learning and reduces instructional time.

Multimedia. Learning is enhanced when words and pictures are presented simultaneously (Fletcher & Tobias, 2005). Presenting information through both modes of instruction—auditory and visual—is better than using only one. For example, using a picture of the skill and written instructions

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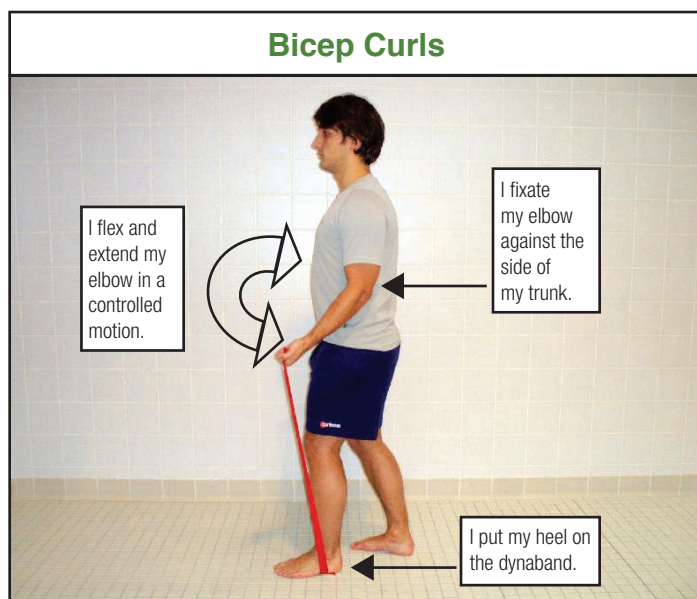


Figure 1.
Task Card for Performing the Biceps Curl

that include critical elements to explain how to perform biceps curls with a dynaband (Graham, Holt/Hale, & Parker, 2010) is better than presenting only a picture or only the written instructions (figure 1).

Spatial Contiguity. Learning is enhanced when written instructions are placed close to the corresponding part of the picture on the task card (Mayer, 2005d). This requires integrating written instructions in the picture on the task card. For example, fixating the elbow on the side of the trunk is a critical element when performing biceps curls, so placing the words depicting this element close to the elbow on the picture can improve learning (figure 1).

Signaling. Learning is enhanced when written instructions are connected with the corresponding parts of the picture by, for example, arrows (Mayer, 2005d). This principle is an extension of the spatial contiguity principle. In figure 1 the critical element “fixate the elbow on the side of the trunk” is connected with an arrow to the elbow on the picture.

Coherence. Learning is enhanced when extraneous, irrelevant words and pictures are omitted from the task cards (Mayer, 2005d). The idea is to develop a coherent instructional message. For example, when developing a task card to perform the leg press, it is better to use a picture with a “clean,” nondistracting background, as can be seen in figure 2. Avoid pictures with other people in the background, written text, and distracting colors. Also, avoid duplicating information.

Personalization. Learning is enhanced when written instructions on task cards are personalized (Mayer, 2005c). First- and second-person statements create a more user-friendly tone than third-person statements. Third-person statements can be easily replaced with “I,” “you,” or “your.” For example, “I flex and extend my knees in a controlled motion” is a preferred way to instruct how to perform a leg press exercise on a task card (figure 2).

First- and second-person statements create a more user-friendly tone than third-person statements.

Segmentation. Learning is enhanced when a complex skill to be learned is segmented over several pictures (Mayer, 2005b). These pictures might be presented on one or on multiple task cards. For some skills, it might be important to describe the starting position, the movement execution, and the ending position in separate pictures or on separate task cards. When instructing how to perform the leg press, a picture with corresponding instructions about the starting position might be combined with a second picture and instructions about the movement itself (figure 2).

Considerations for Design. The effects of these task-card design principles on student learning will depend on prior knowledge (Kalyuga, 2005). Students lacking prior knowledge tend to benefit more from an appropriate design than students with higher levels of prior knowledge. For example, a student playing on the high school tennis team will benefit less from well-designed task cards explaining how to perform a forehand stroke than a classmate who lacks experience in tennis. In other words, the more knowledgeable a student is about the learning task, the less important the design of the task card becomes.

Research also suggests that multimedia tools are more helpful when students have control over their learning and when time is unrestricted (Tabbers, Martens, & Van Merriënboer, 2004). Task cards allow students to learn at their own pace. They can be studied as long as necessary, read and reread, until the content is fully understood. Learner control is often absent in other instructional media, such as dynamic animations on DVD, which are often system-paced. However, since physical education classes have limited available time, well-designed instructional tools are essential to maximize time on task.

Task Cards in the Reciprocal Style of Teaching

This section provides a brief discussion of the use of task cards in peer-learning settings. The focus will be on the implementation of task cards in the reciprocal style of teaching (Mosston & Ashworth, 2002). In the reciprocal style of teaching, students are paired; while one learner completes a motor task (the doer), the other (the observer) observes and provides feedback based on information presented on a task card. Task cards are central to the implementation of the reciprocal teaching style. Directions for successfully implementing task cards for observation, instruction, and assessment of peers within reciprocal-learning settings will be presented later in this article.

The use of task cards in peer learning has been documented in the physical education literature (Barrett, 2005; Block et al., 1995; Byra, 2004; Dyson, 2002; Iserbyt et al., 2010, 2011; Johnson & Ward, 2001). Dyson argued that task cards help to hold students accountable for learning motor skills, a key element in cooperative learning that is often missing. Barrett used task cards during

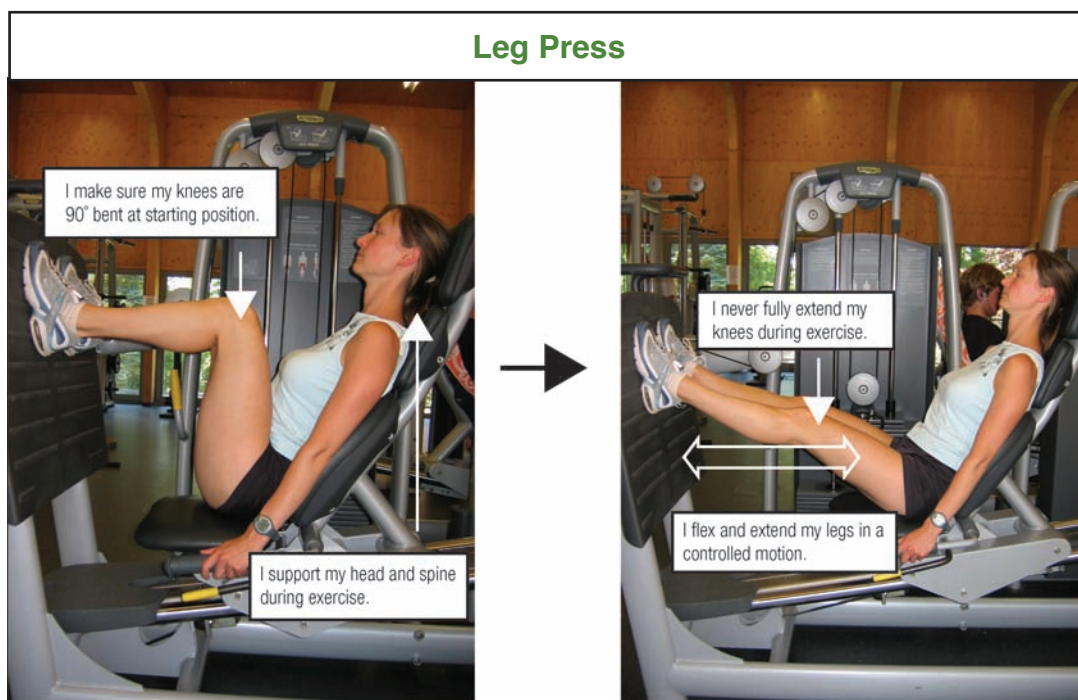


Figure 2.
Task Card for Performing the Leg Press

practice time to facilitate peer assessment in a cooperative-learning strategy with sixth-grade students learning handball. Johnson and Ward implemented task cards during a 20-lesson striking unit to help students learn basic racquet strokes. Iserbyt and colleagues (2011) found that students demonstrated similar learning gains when taught tennis through a peer-learning setting with task cards as through direct instruction.

Task Progression

In 2004, Byra presented a “task progression” for implementing the reciprocal style of teaching. A task progression is an instructional practice used by physical educators “to lead the learner from beginning levels to more advanced levels with the content” (Rink, 2010, p. 83). Organizing content for learners by means of task progressions is a widely accepted strategy used in physical education instruction (Graham et al., 2010; Griffey & Housner, 2007; Rink, 2010; Siedentop & Tannehill, 2000) and is supported by research (French et al., 1991; Hebert, Landin, & Solmon, 2000; Rink, French, Werner, Lynn, & Mays, 1991). Applying the concept of task progressions to organize learning content and presenting it by means of task cards is an appropriate instructional practice.

An integral component of the reciprocal style of teaching is the task sheet (Mosston & Ashworth, 2002). The observer in the reciprocal style of teaching uses the task card, or task sheet, to deliver positive and/or corrective feedback to the doer. Byra (2004) suggested that task cards be used in the final task of the task progression he presented for implementing the reciprocal teaching style. These task cards include doer and observer names, directions for the doer and observer, and space to record student performance. Byra further indicated that task sheets need only be used “when the teacher wants to have a record of student performance” (p. 45). However, task cards can be effectively used across the entire

sequenced task progression that Byra proposed for delivering the reciprocal style of teaching. Also, the task cards used as examples in this article do not necessarily need to contain the names of the doer and observer, or space to record performance. For more information about the reciprocal style of teaching and how teachers can best implement it in their physical education classes, readers are encouraged to read Byra’s (2004) article.

The progressive use of task cards and the teacher behaviors required for successful task-card implementation will be discussed in terms of achieving motor, cognitive, and social goals. The levels described below refer to the progressions suggested for task-card use.

Level 1—Task Cards as Observational Tools

When introducing task cards for the first time in the reciprocal style of teaching, it is recommended that they be used as observational tools with content that has been previously rehearsed or practiced. Hence, task cards can be implemented after the students have had some experience with the content. Take, for example, students who are learning the badminton serve stroke. In the first lesson of the instructional unit, the students need to learn how to perform the underhand serve in badminton under the conditions of a more direct, teacher-centered instructional style like the practice style of teaching (Mosston & Ashworth, 2002). In the practice style of teaching, the teacher would demonstrate the underhand serve for the students and then have the students practice it. While the students are performing the underhand serve, the teacher observes each student’s performance and offers individual and private feedback. The focus of the practice style of teaching is on motor skill improvement.

When students have gained a base level of skill proficiency through practice in one or more episodes, they are ready to use

Table 1.
Learning Goals Associated with Using
Task Cards as Observational Tools

Learning Domain	Goal
Motor	Students refine skill performance in pairs through teacher and peer instruction.
Cognitive	Students observe, compare, and contrast performance against the critical elements on the task card and decide what is correct or incorrect in their partner's performance.
Social	Students give feedback to their partner. Students offer feedback in a positive way to their partner. Students accept feedback from their partner.

task cards in the second lesson of the unit under the conditions of the reciprocal style of teaching. In continuing with the underhand serve example, in pairs one student (doer) performs the underhand serve while the other student (observer) checks for the critical skill elements listed on the task card and offers skill-related feedback to the doer. When using task cards within the framework of the reciprocal style of teaching, it is not only important for the teacher to model the skill to be learned, but for there to be a cooperative, interactive behavior between the doer and observer. From the cognitive and social perspectives, this requires the observer to know the task criteria, watch the doer perform, compare and contrast the doer's performance against the criteria listed on the task card, conclude what is correct and what is not, and finally communicate the results of the analysis to the doer (Mosston & Ashworth, 2002). Motor, cognitive, and social learning goals can be achieved when using task cards in this way in the reciprocal style of teaching (table 1).

Getting students to understand the role of the observer requires careful modeling and supervision from the teacher. Giving clear instructions before the teaching episode and conducting reflective talks after the episode will help in this matter. In reciprocal teaching with task cards, the key to successful performance is having the observer do his or her job professionally and accurately.

Level 2—Task Cards as Instructional Tools

When students are familiar with using task cards as observational tools, they can use them to gain new skills. This requires careful preparation, modeling, and different instructional strategies from the teacher. Successful student performance will largely depend on the quality of the task cards, the quality of teacher instruction, and the level of appropriate interactions within student pairs. Using task cards to learn new skills is much more demanding for students, and it addresses more complex motor, cognitive, and social goals (table 2). For example, in a fitness unit, students may learn how to perform fitness exercises in pairs using task cards. After initially

demonstrating the exercises and behaviors required of the observers and doers, the teacher turns the episode over to the learners. While the observer reviews the new exercise(s) with the doer, the doer attempts to perform the exercise(s) as presented on the task card through the explanation provided by the observer. Incorrect performance by the doer may require another demonstration by the observer. These instructional actions—explaining and demonstrating—represent a new level of cognitive engagement required of the observer. While the doer is performing, the observer must constantly check his or her partner's performance against the criteria on the task card. This checking is very important since it serves as the basis for providing feedback. A new level of social engagement is also required—one that necessitates the observer to be comfortable and confident enough to demonstrate a new task to a partner, and the doer to be accepting enough to listen to and respect the observer's instructions.

To foster student success, the teacher must clearly model the interactive behaviors required of the observer and doer at the start of the episode. Once the students are engaged in their roles, the teacher must provide role-related feedback at every possible opportunity to reinforce appropriate communication between the paired students. In addition, the teacher needs to observe both the doer and the observer's response to the doer's actions in order to provide adequate task-related feedback. This requires the teacher to encourage the observer to rephrase or repeat the instructions on the task card when the doer is not succeeding instead of stopping the pair and demonstrating the task for them. Student and teacher success with using task cards in the reciprocal style of teaching will depend on the amount of experience both gain with the instructional behaviors involved.

Table 2.
Learning Goals Associated with Using
Task Cards as Instructional Tools

Learning Domain	Goal
Motor	Students learn and rehearse a new skill in pairs based on the task-card instruction provided by a peer.
Cognitive	Students interpret the instructions on the task card and rephrase them to a peer. Students recall and demonstrate key aspects of a skill presented on a task card to a peer.
Social	Students give instructions to and receive instructions from a peer. Students offer instructions to a peer in a positive way. Students repeat or rephrase instructions when their partner is struggling or asks for it. Students listen to each other and are silent when their partner speaks.

Figure 3. Partner's Assessment Form**Assessing My Partner's Motor Performance**

Name of Assessor: _____

Name of Doer: _____

DIRECTIONS TO THE ASSESSOR: Observe your partner while she/he executes the biceps curl 5 times and the leg press 5 times. For each statement under Biceps Curl and Leg Press, circle A for Always, S for Sometimes, or N for Never.

Be as honest as possible—remember, your evaluation is helping your partner know how she/he is doing in terms of the listed statements. This, in turn, will help your partner attain the goals in our physical education lessons.

Use the Biceps Curl and Leg Press Task Cards when assessing your partner.

BICEPS CURL

<i>Statement</i>	<i>Assessment</i>		
1. My partner's elbows are fixed (touching) to her/his trunk.	A	S	N
2. My partner's heel is on the dynaband.	A	S	N

LEG PRESS

<i>Statement</i>	<i>Assessment</i>		
3. My partner has a 90° bend (knees) at the starting position.	A	S	N
4. My partner does not fully extend her/his knees during the exercise.	A	S	N

Level 3—Task Cards as Assessment Tools

Using task cards for peer assessment is the final and most difficult form of task-card use in the reciprocal style of teaching. Although we acknowledge that all task-card uses include some form of assessment, since there is always feedback provided, the specific use of task cards for assessment goes further by asking students to mark each other's performance relative to predetermined standards or criteria. This puts a high demand on students from a cognitive and social perspective. Students are asked to observe their partner's performance, compare it to the criteria on the task cards, and then judge the performance according to the scoring system provided. Socially, it is difficult to score a partner, especially when the partner is a friend and when pairs include different skill levels.

Toward the end of a fitness unit, perhaps during the last or second-to-last lesson, the students may be asked to assess their partner's physical performance. An assessment form, designed to be used in conjunction with the biceps-curl and leg-press task cards (figures 1 and 2), is presented in figure 3. The assessment form includes directions to the assessor, information about helping the partner improve performance, criteria statements reflecting the

critical elements presented on the task cards, and an assessment protocol (scoring system). A relatively simple three-point scoring system is presented.

Assessment of a peer need not be limited to physical or motor goals; it can extend to cognitive and social goals as well (table 3). The assessment form presented in figure 4 can be used to assess a partner's feedback and instruction as it applies to the cognitive, social, and motor goals of the unit. This assessment instrument includes directions to the assessor, criteria statements categorized according to learning domain, and the same three-point scoring system used with the motor-performance assessment form.

It should be stressed that assessing motor, cognitive, and social goals gives a more complete picture of student ability. When cognitive and social goals are valued as highly as motor goals, it may provide students with an added level of enthusiasm, interest, and motivation to participate in physical education classes.

Some teachers may worry that students will perform the assessment unfairly in favor of their partner. This can be countered by getting students to understand that assessment is a part of learning and is not an end in itself. In addition, performing an incorrect assessment can have negative consequences in the case of teacher evaluation, since this would mean that the student is not able to observe adequately or interpret the critical elements stated on the task cards. However, ensuring a safe environment for assessment and stressing that assessing honestly is crucial for ongoing improvement might be sufficient for students to do this job as it should be done.

Table 3.
Learning Goals Associated with Using
Task Cards as Assessment Tools

Learning Domain	Goal
Motor	Students refine skill performance in pairs through peer feedback.
Cognitive	Students observe, compare, and contrast performance against the critical elements on the task card; decide what is correct or incorrect; and record (assess) their partner's level of performance. Students understand that their partner's assessment is provided to help them attain the goals of the lesson. Students reflect on the assessment in pairs.
Social	Students assess their partner and accept to be evaluated. Students perform the assessment in a respectful way. Students communicate about the assessment during reflection.

Guidelines for Teachers

The implementation of task cards in the reciprocal style of teaching requires both the teacher and students to become accustomed to the process. The teacher needs to adapt to new management and instructional strategies, and the students must become less dependent on the teacher and more dependent on the task cards and their partner. This is a process that needs to be carefully planned by the teacher. Teachers should keep in mind the following guidelines when implementing task cards in peer-learning settings.

Start Easy. As a rule of thumb, start with familiar tasks on task cards and use small segments of lesson time for working with task cards in the initial phases of their implementation. This is especially important when students are used to working in learning settings dominated by direct styles of instruction. Often the transition from a direct style of instruction to reciprocal peer teaching with task cards happens too abruptly, leaving students confused and making teachers believe that task cards will not work with their students. Initially, teachers might use task cards to support content the students are already familiar with. For example, as part of a class warm-up the students might be asked to perform some stretching exercises that they are familiar with and that are demonstrated on task cards hanging on the wall of the gymnasium.

Clearly Define the Roles of the Students. When asking students to cooperate in peer learning, the teacher must be clear in defining and describing what it means to be a doer and an observer. Expected behaviors of doers and observers need to be clearly explained and, more importantly, modeled. The observer's instructions could be given as follows:

With task cards in hand, tell the doer what to do, if needed, and then observe her or his performance. Compare and contrast the doer's performance against the critical elements listed on the task cards. Conclude what is correct and/or incorrect about the performance, and offer performance-related feedback.

The doer's instructions could be given like this:

After listening to the observer's instructions, perform the task and take into account the observer's feedback as subsequent trials are performed.



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Figure 4. Partner's Feedback Evaluation Form

Evaluating My Partner's Feedback and Instruction

Your Name: _____

Name of Observer: _____

DIRECTIONS: For the past three lessons, you used task cards while working with the same partner in the reciprocal style of teaching. For each statement under Cognitive, Social, and Motor, circle A for I agree, PA for I partially agree, or DA for I disagree. Be as honest as possible. Your partner will not see the scores that you circle.

COGNITIVE

- | | | | |
|---|---|----|----|
| 1. My partner's feedback was specific to the critical elements listed on the task cards. | A | PA | DA |
| 2. My partner could rephrase the instructions to help me better understand the task when necessary. | A | PA | DA |

SOCIAL

- | | | | |
|--|---|----|----|
| 3. My partner listened carefully when I offered instruction and/or feedback. | A | PA | DA |
| 4. My partner offered instruction and feedback in a positive manner. | A | PA | DA |

MOTOR

- | | | | |
|---|---|----|----|
| 5. My partner's feedback helped me improve my performance in the biceps curl and leg press. | A | PA | DA |
|---|---|----|----|

When the students understand their roles, they will be more effective in working together and achieving motor, cognitive, and social learning outcomes (Iserbyt et al., 2010).

Ensure Task-Card Use. Task cards can be seen as static teacher demonstrations and instruction. They serve as an important source of information for learning the task and should therefore be continuously consulted. Often, task cards are placed on the floor at activity stations in the gymnasium. When students rotate from one station to the next, the teacher must emphasize the use of the task cards by instructing the observer to read the instructions aloud for the doer. If this is not asked of the students nor supervised by the teacher, task cards might be minimally consulted, decreasing potential learning.

Hold the Observer Accountable. When supervising peer learning with task cards, the teacher's feedback is primarily directed to the observer. Indeed, it is the observer who is directly responsible for the doer's performance, and the observer should be held accountable for it. The teacher must praise the observer when he or she provides accurate feedback to the doer. When instructions or feedback are inaccurate, the teacher must guide the observer to reread the task card(s). For example, "Is your partner's performance correct

according to the instruction on the task cards?” or “What does the task card say about the performance of that skill element?” Redirecting attention to the task cards is of major importance. Teachers make a mistake when they take over the role of observer, or provide instructions directly to the doer without making the observer consult the task cards. Doing so would hinder the observer from taking responsibility for the learning process of the doer.

Managing and Facilitating Learning

Implementing the reciprocal style of teaching with task cards puts high demands on the teacher’s managerial skills. To avoid managerial issues, it is important to take into account the previously stated guidelines. Starting off with an easy task that the teacher masters very well increases the chance of success. Making sure that students

Task cards are valuable instructional tools that can support student learning in various content areas of physical education.

are prepared to cooperate by clearly instructing and modeling the tasks of doer and observer before practice will also help. It is recommended to ensure a very strict management of what needs to be done, and where and when. For example, the teacher might use poly spots to mark where pairs can practice safely. Before practice, the teacher might instruct all observers to take the task cards in their hands and get ready to read them aloud for the doer. Next, the teacher can use a signal (e.g., a whistle blow) to get students started. The teacher then walks around observing doers and observers, while providing feedback. The teacher observes performance and social behavior (i.e., cooperational features), and his or her feedback is directed to the observer. After a given time, the teacher uses another whistle blow to stop students and asks them to switch roles. Again, the teacher instructs the observers to take the task cards and get ready. A whistle blow gets them started again.

Concluding Thoughts

Task cards are valuable instructional tools that can support student learning in various content areas of physical education. Their strength lies in the fact that they are easy to implement in daily practice and easy to create since most physical education teachers have access to a computer and a printer in their school. Task cards can be used multiple times, and across different target groups. They can help the teacher in addressing several motor, cognitive, and social goals in a progressive way.

This article discussed the design and implementation of task cards in the reciprocal style of teaching as observational, instructional, and assessment tools. Six design principles for task cards have been proposed and exemplified. Taking into account these principles can enhance learning and reduce instructional time.

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