Original Article

Third Grade Students' Self-Assessment of Basketball Dribbling Tasks

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Published online: December 25, 2012

(Accepted for publication November 15, 2012)

DOI:10.7752/jpes.2012.04063;

Abstract:

The purpose of this study was to examine third grade students' ability to accurately self-assess their performance on three dribbling tasks. Participants were 20 third grade (mean age = 8.5) physical education students who were videotaped performing three dribbling tasks (stationary dribbling, dribbling while moving, and directional dribbling around cones). Immediately following each task, students assessed their performance through either live or video recall on four skill cues using a specific checklist. One week later students performed the dribbling tasks again and assessed their performance using the alternate recall method. Two trained observers independently assessed the students' performance, and scored the students' responses as correct, overestimated, or underestimated. Criterion results of the dribbling tasks showed students struggled with accurately assessing the dribbling cues, but students were more accurately able to assess performance from video recall than live recall. Boys more accurately assessed skill performance than girls, although both were more likely to overestimate than underestimate. Overall, the results indicate the students in this study were minimally successful at assessing their own skill performance during one episode of dribbling regardless of the type of recall. These results suggest that specific training may be needed to help students accurately assess skill performance.

Key Words: - Video recall, self-assessment, feedback, gender, physical education, dribbling skills

Introduction

According to motor-learning research, feedback is a crucial variable in students' development of motor skills (Rink, 2003; Silverman, Woods & Subramaniam, 1998; Graham, Holt/Hale & Parker, 2013). Research has shown that relationships do exist between feedback and student achievement (Magill, 2010). Therefore, teacher feedback is considered an essential instructional strategy in physical education and is emphasized in most teacher training programs. Feedback appears to be best when the information received by the learner is individualized and is delivered during or immediately following the performance. However, the reality is most physical education students receive minimal amounts of individual skill performance feedback due to large classes. Feedback is more often used by teachers to provide general skill prescriptions to the class as a whole and as a class management tool. Due to these limitations, Rink (2003) suggests teachers must incorporate alternative methods for providing student feedback.

Student learning may be enhanced in physical education if students have an opportunity to experience intrinsic feedback (Rink, 2003). Techniques such as self-assessment may encourage students to become self-invested in learning. Successful implementation of self-assessment would allow for teacher feedback to be delivered constructively, focusing on helping individual students improve and not using feedback solely as a means of classroom management.

Self-assessment could be used to encourage students to compare a previously demonstrated and explained correct performance with their own immediate and previous performances and then make necessary corrections to their performance. Thus, allowing for an increase not only in student knowledge but also in analysis and application.

If it proves that external feedback is crucial to the assigned task then teachers can use alternatives to teacher feedback such as videotaping or peer teaching (Rink, 2003) as a means of assessment and learning. Videotaping provides the teacher and the learner with an opportunity for instant feedback (Fukink, Trienekens, & Kramer, 2011). In the past, videotaping as a means of feedback and assessment has generally been led by the teachers (Darden, 1999). Although this may be beneficial, the student tends to be forced into a passive role with regard to the interpretation of their performance and this could be detrimental to the learning process. A student who is given the opportunity to assess their own performance through video recall may gain increased understanding and be able to make corrections regarding their performance. Through videotaping, students are provided with outcome information, (Kernodle & Carlton, 1992) which they do not usually have an opportunity

to see and this replay of performance may enhance learning. Janelle, Barba, Frehlich, Tennant, & Cauraugh (1997), suggest that to this point the majority of feedback research deals with the teacher and the learner is neglected. Salmoni, Schmidt, & Walter (1984), suggests that students can develop a dependence on feedback causing a negative effect on learning due to lack of processing. It is suggested that the students should be provided with an environment that encourages learning for themselves, not waiting to be spoon fed knowledge but instead striving to discover for themselves (Janelle et al, 1997; Fedenburg, Lee, & Solomon, 2001). Self-assessment may encourage students to be self-motivated and provide them with the necessary tools to help themselves learn.

It was hypothesized that (1) third grade students would more accurately assess themselves using video recall than live recall, and (2) boys would be more likely to overestimate their performance when compared to girls of similar age. Bandura (1986) states that overestimation of ability, if not unrealistically exaggerated, can be advantageous.

Material & Method

Participants

Twenty randomly selected students were selected from two third grade physical education classes in the rural south of the United States. Of this group, 11 were girls (mean age = 8.4) and 9 were boys (mean age = 8.7). The ethnic backgrounds of the children were both African American ($n = 4$) and Caucasian American ($n = 16$).

Instrument

In an attempt to discover the students' ability to correctly assess themselves while performing three basic basketball dribbling tasks (stationary dribbling, dribbling while moving, and directional dribbling around cones), the researchers devised a self-assessment checklist. The checklist was based upon skill cues with which the students were already familiar. These included (1) dribbles with the finger pads, (2) dribbles with the hand on top of the ball, (3) dribbles with the head up and eyes looking forward, and (4) dribbles with the ball below the waist. Immediately following each dribbling task, the students were asked to rate themselves on their ability to perform the four cues using a checklist that ranged from "always", "sometimes", "never", or "don't know".

Validity

The instrument used in the self-assessment tests was devised by the researchers and was not based on any previous instruments. Two experts in the physical education pedagogy field approved the self-assessment checklist for appropriate use in this project.

Observer Training and Assessment. The four researchers first discussed the criteria and critical elements that would comprise a score of "correct", "overestimated" and "underestimated" to be used when conducting the dribbling assessments. This meeting was followed by the development of a decision log following videotape assessment. At the completion of these discussions, a videotape of 12 dribbling samples was generated. Each of the researchers then viewed the videotape and coded student performance. Agreement across the four researchers ranged from 92.3% to 96.8%, with all reaching agreements above 90% for the three dribbling conditions.

Reliability Assessment. Interobserver reliabilities were conducted at two points during the study (after the first set of assessments and following the retrieval). During reliability checks, two observers independently coded the same students from six randomly selected dribbling tests. A percentage of interobserver agreement (IOA) was calculated for each variable using the following formula: $[\#agreements / (\#agreements + \#disagreements)] \times 100$. IOA were conducted for a total of 6 (30%) of students, and exceeded 94% for all 6 students.

Procedures

The week before the test students were given the opportunity to practice the skills cues and were informed regarding the purpose of the test. Students were assured that the results were not being used as part of their physical education grade but instead to determine if they could accurately assess how they performed on the three dribbling activities. The levels and cues were explained and demonstrated and the students practiced each level and were encouraged to practice independently before the actual assessment day.

The students were randomly allocated to two separate groups, with each group performing the test in the opposite order. Group 1 performed the skills and then self-assessed without any feedback. One week later, that group performed the skills, and then self-assessed after watching a videotape record of them dribbling. Group 2 performed a video assessment in week one followed by the live assessment one week later. The purpose of two groups was to rule out any chance of practice effect. Both groups were tested independently of each other.

On the first test day, students were given a review of the tasks and cues and were encouraged to practice while waiting their turn. The students were presented with a copy of the self-assessment checklist and asked to familiarize themselves with the cues. Each participant completed the three dribbling tasks in random order to rule out practice effect. Students involved in live recall completed the checklist after completion of each level while students involved in video recall viewed each level and then completed the checklist for that level. The students were allowed to re-watch each level as needed but only two students chose that option. Upon completion of the test, the researchers viewed the students on video and correctly assessed their performance.

Statistical analysis

The dependent variable in this study was the differences in the researcher's assessment and student assessment on the checklist. These were measured for overall accuracy as well as accuracy by recall option (live

or videotaped). Analysis of variance (ANOVA) was conducted to determine differences between boys and girls and between the recall options. Eta-Squares were calculated to assess effects-sizes (Cohen, 1988)

Results

Table 1 provides the descriptive statistics for these students on live and videotaped assessments.

Gender	Recall condition	Correct evaluation <i>M</i> (<i>SD</i>)	Overestimation <i>M</i> (<i>SD</i>)	Underestimation <i>M</i> (<i>SD</i>)
Girls	Live recall	53.31 (27.58)	28.24 (28.75)	19.44 (20.98)
	Video recall	73.48 (18.69)	11.36 (15.42)	15.15 (16.46)
Boys	Live recall	70.55 (29.33)	20.56 (29.81)	8.88 (16.98)
	Video recall	76.67 (19.67)	14.17 (18.19)	9.17 (15.37)

A comparison of the overall means indicated boys ($M = 73.61$) more accurately assessed skill performance than girls ($M = 62.90$) [$F(1,150) = 6.75, p = .010, \eta^2 = .101$]. The key explanation for this difference is that the girls were more likely to underestimate (17.29% vs. 9.03%) their level of ability to perform the task with respect to cues [$F(1,150) = 7.85, p = .006, \eta^2 = .150$].

Concerning the individual tasks, these trends remain the same (see Figure 1). That is, boys were more accurate than girls irrespective of the dribbling task. However, none of the tasks themselves favored a more accurate response.

Figure 1. Accuracy rates (in percent) of students across the three dribbling tasks.

Figure 2 shows the stark contrast between the students level of accuracy when they assessed their ability live compared with when they had the opportunity to view themselves on the videotape. In this case, it can be seen that when students self-assess without visual feedback, they are considerably less accurate [$F(1,150) = 10.94, p = .001, \eta^2 = .068$]. However, the error is in terms of how much the students overestimate ability [$F(1,150) = 7.84, p = .006, \eta^2 = .050$]

Figure 2. Accuracy rates (in percent) for the two recall conditions.

Discussions

Overall, the results indicate the students in this study were moderately successful at assessing their own skill performance during one episode of dribbling regardless of type of recall. The results of the dribbling tasks showed that students struggled with accurately assessing the dribbling cues. Students were more accurately able to assess their performance from video recall than live recall. In regard to gender, boys more accurately assessed their skill performance than the girls, although both were more likely to overestimate their assessment than underestimate. The evidence suggests that the hypotheses cannot be strongly supported as there is a lack of statistical significance in all reported cases.

The sample of third grade students does not violate the assumption of independence of observations since each student was tested independently of their peers. The sample represents a normal distribution of the third grade population in physical education and was achieved as independent and random sampling took place. Equal variances were assumed.

A limitation of the study may be that more than three cues were required for the students to accurately assess their dribbling performance. It has been noted that more than three points may overload the learner (Belka, 2002).

Future research should repeat the study after the students have been specifically trained to accurately assess their skill performance using both live and video recall.

Conclusions

In conclusion, accurate and useful feedback is important to promote skill development and successful skill performance. Often, providing timely and individual feedback can be a challenge for physical educators due to teaching constraints. A logical solution is to teach students how to self-assess accurately. Such training could benefit students not only in physical education, but also in leisure and recreational pursuits when a teacher or adult may not be present. After all, producing independent learners has been a longstanding goal in education.

This study attempts to explore this goal, but has proven to be no easy task. Regardless of live or video recall, students were only moderately successful at assessing their own skill performance. Many factors can contribute to students lack of skill in self-assessment such as learner overload, the age of students, and familiarity with the criteria or motor skill. More research is needed to evaluate these factors and to discover methods for training students to successfully and accurately self-assess skill performance.

References

- Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, New Jersey: Prentice Hall, Inc.
- Belka, D.E. (2002). A strategy for improvement of learning-task presentations. *Journal of Physical Education Recreation and Dance*, 73, 32-37.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. New York: Academic Press.
- Darden, G. F. (1999). Videotape feedback for student learning and performance: a learning-stages approach., *Journal of Physical Education, Recreation & Dance*, 70 (9), 40-45;62.
- Fredenburg, K.B., Lee, A.M., & Solomon, M. (2001). The effects of augmented feedback on students' perceptions and performance. *Research Quarterly for Exercise and Sport*, 72, 232-242.
- Fukkink, R., Trienekens, N., & Kramer, L. C. (2011). Video feedback in education and training: putting learning in the picture. *Educational Psychology Review*, 23(1), 45-63.
- Graham, G., Holt/Hale, S.A., & Parker, M. (2013). *Children Moving: A Reflective Approach to Teaching Physical Education*. 9th ed. New York: McGraw-Hill.
- Janelle, C., Barba, D., Frehlich, S., Tennant, L., & Cauraugh, J. (1997). *Research Quarterly for Exercise Sport*, 68, 269-279.
- Kernodle, M. & Carlton, L. (1992). Information feedback and the learning of multiple-degree-of-freedom activities. *Journal of Motor Behavior*, 24, 187-196.
- Magill, R. A. (2010). *Motor Learning and Control: Concepts and Applications*. New York: McGraw-Hill.
- Rink, J. (2003). Effective instruction in physical education. In S.J. Silverman, & C.D. Ennis (Eds.), *Student Learning in Physical Education: Applying Research to Enhance Instruction*. Champaign, IL: Human Kinetics.
- Salmoni, A.W., Schmidt, R.A., & Walter, C.B. (1984). Knowledge of results and motor learning: A review and critical reappraisal. *Psychological Bulletin*, 95, 355-386.
- Silverman, S., Woods, A. & Subramaniam, P. (1998). Task structures, feedback to individual students, and student skill level in physical education. *Research Quarterly for Exercise and Sport*, 69, 420-425.