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Using technology to provide more objective grading and compliance with "No Child Left Behind"

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Using technology to provide more objective grading and compliance with "No Child Left Behind"

Abstract

In January of 2001, President Bush signed into law the No Child Left Behind Act. "The act redefines the federal role in K-12 education and will help close the achievement gap between disadvantaged and minority students and their peers. It is based on four basic principles: stronger accountability for results, increased flexibility and local control, expanded options for parents, and an emphasis on teaching methods that have been proven to work" (No Child Left Behind Act of 2001, 2003). The passing of the No Child Left Behind Act has added pressure to schools and departments around the country to meet these standards or loose funding. This pressure is permeated throughout the educational field and is intensified as physical educators look for more objective ways to evaluate their students. In the past, many physical educators have graded strictly on whether a student dresses out for class or by their mastery of athletic skills during a specific unit. With the No Child Left Behind Act passing into law, these grading methods will no longer be acceptable to the education community. Physical educators will be required to provide a higher level of accountability to their grading practices.

USING TECHNOLOGY TO PROVIDE MORE OBJECTIVE GRADING
AND COMPLIANCE WITH 'NO CHILD LEFT BEHIND.'

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Using Technology To Provide More Objective Grading And Compliance With 'No Child Left Behind.'

By Kevin Suhr

In January of 2001, President Bush signed into law the No Child Left Behind Act. "The act redefines the federal role in K-12 education and will help close the achievement gap between disadvantaged and minority students and their peers. It is based on four basic principles: stronger accountability for results, increased flexibility and local control, expanded options for parents, and an emphasis on teaching methods that have been proven to work" (No Child Left Behind Act of 2001, 2003). The passing of the No Child Left Behind Act has added pressure to schools and departments around the country to meet these standards or loose funding. This pressure is permeated throughout the educational field and is intensified as physical educators look for more objective ways to evaluate their students. In the past, many physical educators have graded strictly on whether a student dresses out for class or by their mastery of athletic skills during a specific unit. With the No Child Left Behind Act passing into law, these grading methods will no longer be acceptable to the education community. Physical educators will be required to provide a higher level of accountability to their grading practices.

Grading has always been one of the most controversial subjects discussed by physical educators and administrators throughout the educational field. During teacher preparatory classes, physical educators are usually required to complete a course that is devoted to grading and analyzing testing data. At the end of the course, educators are asked to provide more objective grading but little or no time is devoted to showing them how to do this. Unlike a traditional classroom where the teacher instructs and then administers a test to students over the material covered, a physical education classroom,

traditionally relies on subjective grading and performance of skills learned. Physical educators are well prepared to detect an A-level performance, where the student shows mastery in the skill that has been taught. The problem with this method of grading is that it is very subjective and can leave room for criticism. The criticism may be warranted by the individual differences displayed in a given performance in class. With no real record of the student's progress, there is little accountability for the student as well as the educator. This leads to the importance of having an objective measure and record of the student's performance in the classroom. This point has been echoed in classrooms and seminars throughout the country as physical educators continue to search of an objective form of grading that works in the context of their classrooms.

One solution that has been presented to physical educators has been the use of modern technologies such as heart rate monitors, pedometers, and various software applications to aid the process of objective student assessment and grading. The intent of this article is to overview the use of these two types of technologies as a means for physical educators to enhance their objective measures of student performance. There are many technology solutions, however, the pedometer and heart rate monitor are two that are readily available to most physical educators in P12 schools.

Pedometers and Excel Spread Sheets

The use of pedometers in the classroom shows real promise in enhancing the objectivity of grading policies in the physical educator's classroom. Pedometers are simple instruments used to continuously count the number of steps a person takes. Pedometers record steps through the up and down motions of the hip (Tudor-Locke, 2002). In Japan, pedometers have been used for the past 30 years to successfully increase

walking. This is a fairly new concept in the United States and has only seen growth in the past few years. Research shows that pedometers are currently the most cost effective way to monitor a person's daily step pattern (Tudor-Locke, 2001).

Since pedometers measure the number of steps taken by an individual during the day, one of the main questions is, "how many steps are enough?" This optimal number varies by the age level and health of the individual. The one true factor to consider is that the more steps an individual takes the better their physical fitness will be (Tudor-Locke, 2002). Research shows that children in the range of 8-10 years old should register 12,000-16,000 steps per day. Relatively healthy middle aged adults should take between 7,000-13,000 steps a day. This recommended number decreases as age increases (Tudor-Locke, 2002).

Early researchers of pedometer use have reported that it is very accurate at medium range speeds. A study conducted in Japan, which testing the Yamax Digital Walker, proved this device to be the most accurate pedometer, recording 100.6-100.7% of all steps taken in a controlled setting (Tudor-Locke, 2001). However, the accuracy of pedometers has been questioned when tested at slow range speeds, very fast walking, or running (Rowlands, Eston, & Ingledow, 1997). Other factors that have been observed to cause errors in step counts include; the constant movement or shifting of body weight; automobile travel which causes an upward movement; and slow walking adults who do not have much flexion, also referred to as the angle of bend in their legs, can cause the reading to be skewed (1997). All of these factors have been observed to throw off the step count of pedometers (Tudor-Locke, 2001).

The research from pedometer monitoring suggests that physical educators are able to collect a measurable amount of the student's activity during a given class. In addition to the step count, physical educators can integrate Microsoft Excel spread sheets and track vast amounts of data from the students in their classroom (Morrow, Jackson, Disch, & Mood, 2000). Once the data is entered into the spread sheet it can provide the educator with valuable information in which to effectively measure the students' classroom performance (refer to Table 1.0).

Table 1.0

Student	Day 1	Day 2	Day 3	Day 4	Day 5	Average
A	1100	1250	990	1300	1025	945
B	897	1275	1050	1010	1189	904.33
C	825	465	500	865	975	605.83
D	1400	1210	1100	896	1145	959.33
E	985	935	998	1002	965	815.00
F	1082	1134	1222	1268	1301	1002.00
G	965	1201	875	1105	1076	871.17

Table 1.0 Example of the daily step count of students in a class period and the average for a unit of instruction

This data collection can provide students, educators, parents, and administrators with valid feedback that will lead to more objective and measurable results and provide a level of accountability to both the students and the educator.

Heart Rate Monitors

Much like pedometers seem to be a method for enhancing the current grading policies, heart rate monitors appear to be the technology of the future. Heart rate monitors (HRMs) collect valuable and some times life saving information that can monitor a student's performance throughout a given class. Heart rate monitors are used in classrooms to measure a student's heart rate during a given amount of time or specific

activity. Over the past 20 years, HRMs have been widely used to enhance the training of athletes in a variety of sports by providing immediate feedback to athletes regarding their response to exercise (Achten & Jeukendrup, 2003). HRMs can also provide critical information about the intensity of the exercise. The device also can objectively communicate the true physiological effort of the individual to the teacher or trainer and provide more information than what is being viewed subjectively. For this reason, HRMs have become a popular tool for measuring a student's physical activity during a physical education class. Research has shown that HRMs reduce the level of instructor subjectivity and can be used in large groups to monitor the performance of each individual (Plate & Sirard, 2001). When the technology is available, the information that is collected from the HRM can be downloaded to the teacher's personal computer. Once the information is downloaded, the physical educator can take an objective look at each students' performance during the class. With the information from the HRM, the educator can determine a more appropriate assessment of the performance for each individual in his or her class.

Personal Observation

In a recent observation of an elementary classroom, I looked at subjective grading in a physical educator's classroom and compared it to the student's heart rate to determine an appropriate grade for the student's effort in class. The study focused on two students in a class who appeared to be working with a maximum effort. For simplicity, the students will be referred to as student one and student two. During the class, the educator objectivity viewed each student and assigned a daily grade according to his or her 'effort' in the class. This grade was recorded and saved for comparison to the information tracked

by the HRMs. When the data was examined closer, the students' heart rates during the activity did not match the grade that had been assigned by the educator. During the observation, student one was working well below the maximum heart rate and received an 'A' for effort and mastery of skill. Student two was working at or just below the maximal heart rate for the class period. The grade issued by the physical educator for this student's efforts was 'C' which did not coincide with the effort that was presented. The results from this classroom observation supports the fact that physical educators, though skilled in their profession, can evaluate the effort of a student incorrectly. The information collected from the HRM helped the educator determine a more appropriate grade for the students and thus resulted in more objective grading.

As shown in the local study, HRMs can play a key role in the future of physical education by creating more objective assessment tools for grading student performances. This technology, which was once only used in laboratory settings, has moved into the mainstream and become readily available to the physical education classroom (Martin, Grissom , Ward, & Lenders, 2003) The integration of HRMs has received several levels of support from the educational community due to its ability to drastically change the grading policies. Support for HRMs is shown throughout the educational community. Many books have been written to provide guidelines for the integration and sample lesson plans for educators who wish to integrate heart rate monitors into their classroom. In addition to the myriad of books, there are several web sites that have valuable resources to aid in the integration of HRMs.

Conclusion

Technology has played a major role in the development of athletes and the ways that they train. For many years athletes have relied on several pieces of technology to provide them with feedback and accountability for their performance. Physical educators can learn from the use of these tools in the field and apply them to their classroom practices. These tools are capable of providing educators with the information needed to objectively grade students and enhance the learning environment of the physical education classroom. Along with enhancing the learning environment, pedometers and heart rate monitors provide an unsurpassed level of accountability needed in today's era of No Child Left Behind.

References

- Achten, J., & Jeukendrup, A.E. (2003). Heart rate monitoring: Application and limitations. *Sports Medicine: Annual 2003* v33, i7, p.517-539.
- Martin, B., Grissom, T., Ward, P., & Lenders, N., (2003). Effects of wearing a heart rate monitor on elementary students' activity levels during a team handball unit. *Research Quarterly for Exercise and Sport*, v74, i1, p. A49-51.
- Morrow, J.R., Jackson, A.W., Disch, J.G., & Mood, D.P., (2000). *Measurement and evaluation in human performance*. (2nd. ed.) Champaign: Human Kinetics
- No Child Left Behind Act of 2001
Downloaded July 11, 2003 <http://www.nochildleftbehind.gov/>
- Plate, R.R., & Sirard, J.R. (2001). Physical activity assessment in children and adolescents. *Sports medicine*: v31, i6, p.439-455.
- Rowlands, A., Easton R., & Ingledew, D. (1997). Measurement of physical activity in children with particular reference to the use of heart rate and pedometry. *Sports Medicine Auckland, N.Z.* v24, no 4, 258-272.
- Tudor-Locke, C. (2002). Increasing walking using a pedometer.
Downloaded June, 10 2003 <http://www.icaa.cc/ResearchCenter/walking.htm>
- Tudor-Locke, C. (2001). Methodological considerations for researchers and practitioners using pedometers to measure physical (ambulatory) activity. *Research Quarterly for Exercise and Sport*. V 72, no 1, 1-12.