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Using Pedometers in Physical Education Teacher Education (PETE) Programs

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Pedometers have been found to be a valuable teaching tool in physical education class at almost every level of education (Scruggs, Beveridge, Eisenman, Watson, Shultz & Ransdell, 2003). While there are a variety of different pedometer styles, shapes and sizes, the information that can be compiled from each can be just as different. The basic pedometer can measure steps taken, distance, time a person is in activity, calories burned and a few other fundamental measures. In addition, some pedometers record heart rate, have time-of-day displays, are weather resistant, have alternate metric capabilities and provide easy-to-read displays. There has been a variety of research studies conducted with pedometers and the findings have consistently reported using the technology device to be beneficial as both an instructional aid as well as a measurement device for activity during physical education. For example, the research has found that pedometers are a valid method of measuring the amount of physical activity in physical education class; pedometers are easy to use, cost effective, break resistant, come as waist or wrist mounted features and with different measurement capabilities, the devices make students accountable for their activity during physical education class (Barfield, Rowe, & Michael, 2004; Easton, Rowland, & Ingeldew, 1998; Tudor-Locke, 2002; Welk, Corbin, & Dale, 2000). Thus the question can be asked, “How can a Physical Education Teacher Education (PETE) program take the research findings as well as school-based teaching reports from different levels and implement them into PETE classes for the purpose of preparing students to use pedometers in their field-based experiences or as a professional physical education teacher with classes.

While pedometers come in different sizes and shapes, the functions are the critical element to focus on when selecting the correct model for the class.

The following are ideas for implementing pedometers in a PETE core program of instruction. While they may best be utilized in an activity course, pedometers can be inserted in just about any PETE class lesson. The pedometer could be introduced to students in their Foundations of Physical Education class, “Pedagogy” of activity or Skills classes (team; individual; rhythm & dance; net/wall; target; outdoor; adventure; fitness-based), Physiology of Exercise class or lab experiences or in their elementary and/or secondary Methods of Teaching Physical Education classes. Introducing the features and how-to-use these devices also fits well into an upper level “assessment” class, measurement and evaluation, adapted physical education class or any school health program classes.

The pedometer should have easy to reach controls and the display should be large enough to read.

1. **First**, introduce the pedometer to the students. Here is a chance to have the students look and hold the pedometer. Let the students put the pedometer on their belt or the waistband of their shorts at the hip or waistline and have them walk around to see how many steps they take when walking around the room. This gives the students a chance to open up the pedometer and see exactly what their specific model pedometer measures. Typically, the basic pedometers will measure the steps a person takes viewed on a three to six digit display. Certain pedometers, in addition to steps, measure distance accumulated during activity, usually in the form of steps converted to miles by entering stride length, heart rate, caloric expenditure, they also measure how much exercise time a person is in activity, memory, exercise intensity and some pedometers have a clock function. Students will get to see firsthand how unobtrusive the pedometer can be during activity. It is important that the students know how to successfully slide the back clip of the pedometer onto the belt or clothing at the waistline. As a result of the PETE students’ lack of exposure to
Pedometers, they typically struggle to properly put the pedometer on their waist. If the students do not learn how to successfully put the pedometer on themselves correctly, there is a good chance they will not be able to help K-12 students when they are teaching their own physical education classes.

- Second, teach the students about the features and how the measurements are made. PETE students must have a thorough knowledge of what the pedometer is able to measure and how to access the information. It is also important to develop a systematic presentation to teach about all the bells-and-whistles. Part of the presentation must include information regarding accuracy. When positioned correctly and at speeds upward of 3 MPH several devices have been reported to reach an accuracy rate of 96%. At lower speeds of 2-3 MPH the accuracy drops to 70%, but the research is clear about the quality of the device as well as the need for correct positioning of the device so as not to impact the numbers collected negatively.

Here are some suggestions to include in your lesson:

- Demonstrate how to hold and open the device using a technique that will ensure the device is not dropped to the ground.
- Demonstrate all the buttons, modes, displays, memories, tracking capabilities, and all the alternate read-outs that the students will certainly find as they play with the device.
- Demonstrate how the initial information is entered into the device. If stride length is entered to calculate distance, be exact as it will make the collection more accurate. It is critical for users to know how the mechanism is reset. This is critical as you do not want students to lose their data so be clear about what to touch and what causes a reset to "0".
- Demonstrate where the device is to be positioned and how to clip the device correctly in place. Be sure to explain how the device works and if it needs to be horizontal-to-the-ground to be accurate.
- Show students how to connect the loss prevention strap and clip to a secure place on the belt.
- Demonstrate all the “tricks” to adjusting the numbers. PETE students need to know what to watch for as students are active so as to avoid a manipulation of their activity level. Better models (more expensive have “false step” sensors and are difficult to shake into more steps or burning calories.

- Third, the actual hands-on experience for the students in PETE classes is a critical teaching-learning opportunity to help each individual understand the operation of the device. One of the best ways to implement pedometers into a PETE program would be during an activity class followed by a discussion of implementation potential in an “assessment” class or any of the physical education classes listed above. A very solid implementation example would be to initiate a collaborative effort between the pedagogy of an activity class or methods class where physical activity is common, and a theory class such as assessment where the different measurement potentials can be discussed. In the first setting, during activity the instructor would model a lesson with all the teaching cues and responding to questions with a focus on how to teach using the pedometer as an instructional support tool. Before class starts the instructor would give the students a scenario to help them understand how the pedometer can be used either as an instructional support device or as an assessment tool. Next, the class will go to the gymnasium and the instructor will teach a model lesson to the PETE students focused on the instructional objective of learning about the device. One thing the instructor can do before the model lesson begins is to have the students predict how many steps they will take during a short activity phase. Specify the goal, your expectations and the activity parameters. This type of sample lesson can usually be accomplished within five minutes. Then have the student write down their predictions of how many steps they will take for the lesson. The instructor and students will then proceed with the model lesson. After the lesson is completed, the actual number of steps is recorded and compared to the student predictions. The instructor now has an opportunity to discuss with the students the lesson and how the pedometer can be used for assessment. As this discussion is taking place, such questions as, “After finishing the lesson and seeing the number of steps you took, is there any way to change the lesson to increase number of steps?” Another question to ask students would be, “How can pedometers be used as an assessment tool?” One last question to pose to students would be, “With the number of steps the students took during the lesson, how could we use these numbers for assessing student activity?” There could be a number of questions for students to reflect upon, but this is a great opportunity for the instructor to give PETE students a hands-on experience on how pedometers can be used in assessing student activity.
Fourth, as the model lesson draws to a conclusion, it is important to be sure that each student has a solid grasp of how to operate, secure read-outs and reset the device. This is an excellent opportunity to check-for-student-understanding of the device and how it operates as well as requiring an assessment-type demonstration of several of the specific checkpoints that are part of the planned experience. The authors also suggest you include several of the tricks and "tomfoolery", and problems that students will create.

Fifth, and one of the most important steps is to review how all the information is accessed and what it will tell the student as well as the teacher. Be sure to display all the different modes and create diverse teaching-learning opportunities that will foster discussion and promote questions. Once all the information is discussed, be sure PETE students know how to provide an age-appropriate explanation of what each number means. This is also a perfect time to present creative ways to teach K-12 students that exercise is fun as well as rewarding.

Sixth, the next step would be for a small group of PETE future-professionals to try to teach the use of pedometers to a college level general activity class. This would require planning, organizing, instructional support materials, communication, and activity planning. This type of team-teaching and instructional collaboration prior to going to the class is a great simulation for when they are in the authentic situation.

Seventh, PETE students using pedometers in a school setting during a practicum or student teaching experience is the final step. Towards the end of the students’ PETE program students should be given opportunities to teach in a school setting, teaching ‘real’ students. This opportunity will come in the 2nd year observation, 3rd year practicum (or similar core field-based course) and then in their student teaching experiences. Each of the school-based experiences provide a different type of opportunity where the student works with a physical education teacher prior to the student teaching experience for a semester. The student teaching experience is when the PETE future-professional assumes all the responsibilities for teaching a full schedule of classes for a whole semester. When both of these teaching occasions are presented, the PETE student has a wonderful opportunity to incorporate pedometers in their instructional units and daily lessons. The authors have seen PETE students incorporate pedometers into college level lessons such as dancing units, team sport units (i.e. basketball, flag football, volleyball, ultimate, team handball), individual sport units (i.e. badminton, tennis, pickleball) and many other non-traditional units (i.e. orienteering, jump bands, fitness, power walking) and then recreate the same lesson on elementary, middle and high school students. The authors have participated in discussions with the PETE students during their seminars just prior to the completion of their student teaching in the school-based assignments. While these soon-to-be professionals consistently report an abundance of anxiety, fear and uncertainty related to interacting with ‘real’ students in a K-12 physical education setting, the seven-step experience helped to ease the uncertainty. Yet, after instruction, the seven steps including observing PETE students teach the implementation of pedometers, the PETE students feel that having pedometers in their lessons helped the lesson to be more successful. Pedometers can be another tool to help PETE students to focus on creative methods of teaching physical education lessons. The use of pedometers can provide positive experiences for both the teacher and student.

In conclusion, research has shown that the pedometer can be a valuable tool in the physical education setting. While you can always teach experienced professionals new skills, there is no better place to expose students to the pedometer than in their PETE program. PETE faculty can use the pedometer in just about any teaching situation. Depending upon how creative the PETE faculty is, it will depend on how and when it can be used. Another thought about the power the pedometer has for physical education is that it gives the field of physical education a different level of importance in the school setting. In the past, physical education advocates have stated that physical activity is good for students. Programs created by practicing physical educators have focused on 5,000 & 10,000 steps a day, orienteering activities, theme adventures, fitness walks, and running to cite only a few of the most obvious. There have also been pedometer monitoring curriculum, either blended with an interdisciplinary approach or stand-alone, that focus on activity in rehabilitative programs, geographic walks, calorie burning, diabetic intervention, heart rate effects, impact on blood pressure, chronic fatigue studies, mood, stress & blood glucose research, smoking cessation potential, and exercise tolerance in older adults. As an instructional tool, pedometers can also be used in programs to support activity with students with special needs. Even so, parents, administrators and others have asked for evidence supporting the claim of benefits as well as the reasoning behind the time expenditure. Pedometers can be used to capture that they are helping students develop healthy lifestyle habits and in turn be seen as an integral part of society. The use of pedometers can be enjoyed by anyone of any age or any ability level. It can fit in just about any lesson and be used for special programs (i.e. Walk Across America) and can be extended outside of the physical education class with after school.
activities. One of the most important lessons that pedometers serve in the activity venue is that students learn that “I can do this.” Activity can be fun and can be a social occasion or a family event where the children influence parents to exercise which also creates an opportunity to talk. Thus, the pedometer can serve as the impetus to increase physical activity, help strengthen physical education’s claim of being valuable, serve as a social conduit and provide some very important quantifiable numbers to impact a student’s education and life. The best place to start on this instructional path is to teach future-professionals how to use, teach and interpret the information from a pedometer.

References


