

3-1-2013

## Influence of Different Teaching Strategies on Physical Activity Levels in a Collegiate Swim Class

Derrick Bass

bass\_derrick@columbusstate.edu

Ellen Martin

martin\_ellen@columbusstate.edu

Follow this and additional works at: <http://csuepress.columbusstate.edu/pil>

 Part of the [Curriculum and Instruction Commons](#), [Online and Distance Education Commons](#), [Scholarship of Teaching and Learning Commons](#), and the [Teacher Education and Professional Development Commons](#)

---

### Recommended Citation

Bass, D., & Martin, E. (2013). Influence of Different Teaching Strategies on Physical Activity Levels in a Collegiate Swim Class. *Perspectives In Learning*, 14 (1). Retrieved from <http://csuepress.columbusstate.edu/pil/vol14/iss1/4>

This Research is brought to you for free and open access by CSU ePress. It has been accepted for inclusion in Perspectives In Learning by an authorized editor of CSU ePress.

## **Influence of Different Teaching Strategies on Physical Activity Levels in a Collegiate Swim Class**

**Derrick Bass**

*Columbus State University*

**Ellen H. Martin**

*Columbus State University*

### **Abstract**

The purpose of this study was to evaluate the effect of the number of teaching strategies used during instruction on the physical activity levels of students. Observations were conducted during a collegiate intermediate swimming class taught by an assistant professor at a university in the southeast United States. The class consisted of 16 undergraduate students from varying backgrounds and major fields of study. The professor was observed for the use of Graham's (2001) 16 teaching strategies. Teaching behaviors were observed using a simple event recording sheet to allow for the occurrence or lack of occurrence of certain teaching strategies to be recorded. Student activity levels were measured using a modification of the SOFIT developed and validated by McKenzie (2009). The data showed an average of 9 of the 16 teaching strategies was used during instruction. Percentage of time spent at a moderate level ranged from 19% - 57% with an average of 35% of observed class time being spent at a moderate intensity level. Analysis of the data showed that there was little correlation between the number of teaching strategies used and the level of physical activity of the students.

### **Introduction**

Physical activity is the key to improving and maintaining health. The U.S. Department of Health and Human Services (HHS) (US Department of Health and Human Services, 2008) reported that every person regardless of age, race, or ability level benefits from physical activity. There is strong evidence that points to physical activity reducing the risk of coronary heart disease, high blood pressure, and stroke (U.S. Department of Health and Human Services, 2008). Yet, according to the Center for Disease Control's (CDC) National Health Interview Survey 2010 (U.S. Department of Health and Human Services, 2012), nearly half of American adults fail to meet the recommended

guidelines for both aerobic and muscular-strengthening activity, thus failing to experience the health enhancing benefits of physical activity.

Research has shown that physical education can have an impact on physical activity levels regardless of the grade level (Slingerland & Borghouts, 2011). Healthy People 2010, an initiative with the CDC, recommend that for students to experience the health enhancing benefits of physical activity, 50% of the class time in physical education should be spent with students participating at a moderate to vigorous level. Researchers analyzed different physical education activities and their effects on activity levels. The two most popular categories of activities were game-based

activities and fitness activities. Gao, Lee, Xiang, and Kosma (2011) observed that soccer based activities produced higher percentages of moderate to vigorous physical activity (MVPA) in secondary students when compared to stations of fitness-gear activities. Other studies, however, have found the opposite to be true. McKenzie, Simon, Sallis, and Conway (2000) examined middle school students and found that the highest levels of MVPA were achieved during daily fitness activities. Another study found that fitness activities provided higher overall percentages of MVPA, while football had higher levels of MVPA for boys but significantly lower MVPA percentages for girls in middle school students (Gao, Hannon, Newton, & Huang, 2011).

The research offers numerous reports on how to increase physical activity levels within a lesson by using effective teaching strategies. Effective teachers used a variety of teaching strategies to promote higher activity levels (McKenzie, Simon, Sallis, & Conway, 2000). Physical activity levels were increased by providing lower teacher/student ratios and more adequate equipment (Bevans, Fitzpatrick, Sanchez, Riley, & Forrest, 2010). Teachers who engaged in effective lesson planning decreased the amount of time spent in management and transitional activities, which, in turn, led to higher activity levels (McKenzie, Simon, Sallis, & Conway, 2000). Effective teachers provided students with adequate and appropriate practice time and minimized students' time spent waiting (Rink & Hall, 2008; Silverman, 1991). Another strategy was the use of distant interactions (Patterson & van der Mars, 2008). Distant interactions were attempts made by teachers to interact with students with whom they were not standing in close proximity. Teachers who make interactions with students across the instructional area

were able to promote more physical activity in their students. Another important strategy used by teachers was modeling and giving cues. These techniques were effective in helping young children perform a skill (Weimar, Martin, & Wall, 2011) and to help children master skills quicker. Engstrom (1999) found that the use of motivational feedback can be used to effectively increase students' affective feelings during activity.

Graham (2001) identified 16 different teaching strategies that teachers use while instructing in physical education that reflect the characteristics of effective teachers from the literature. If effective teachers can increase the level of physical activity while using these strategies, what would be the result of using multiple strategies in a lesson? Thus, the purpose of this study was to examine if the number of teaching strategies used in a physical education lesson increased the physical activity levels of students during a collegiate swim class.

## Methods

### Participant

The participating instructor was from a university located in the south and taught a collegiate intermediate swim class four times a week for 90 minutes for five weeks. The purpose of the course was to give students more practice and chances to learn different swimming strokes that were not taught in the beginning swimming class also offered at the university. The participant was an experienced swim teacher and agreed to be observed but was not informed as to what behaviors were being recorded and analyzed. Observations began when instruction started which occurred after the student warm-up. Teaching behaviors, as well as student activity levels, were recorded live during the observational times. The participant provided informed consent, and approval for the study was obtained from the authors' Institutional Review Board.

## INFLUENCE OF DIFFERENT TEACHING STRATEGIES

The observer maintained a physical position that did not interfere with instructional methods or materials and was positioned primarily to the side of the pool near the main instructional area. However, when the instructor moved around the pool area to instruct students, the observer moved accordingly to hear and record the teaching behaviors accurately.

### Data Collection Procedures

This study was conducted to examine the effect that using documented teaching strategies had on the activity level of students. Five 30-minute segments of separate lessons over the course of two weeks were observed and recorded. Observations began when the instructional segment of the lesson started which was usually about 20 minutes into the 90 minute class period. Event recording was used to record the instructor's use of different teaching strategies. Event recording is an observational technique that is useful for observing and recording data on discrete behaviors. Discrete behaviors are actions that cover a short duration of time and have a definite beginning and ending. The instructor was observed for the use of the following 16 teaching strategies outlined by Graham (2001): establishing protocols, back-to-the wall, instant activity, set induction, scaffolding, teacher demonstration, pinpointing, problem solving, teaching by invitation, intratask variation, extending tasks, refining tasks, applying tasks, teacher feedback checking for understanding, and closure. Simple event recording was used to establish the occurrence or lack of occurrence of these teaching strategies during the observed lessons. If one of the aforementioned teaching strategies was observed, then a mark was made on the recording sheet. For this particular study, only the presence or absence of each strategy was recorded. The

number of times each strategy was used was not recorded.

The System for Observing Fitness Instruction Time (SOFIT) (McKenzie, 2009) is an observational tool that allows observers to simultaneously record data on activity levels, lesson context, and teacher behavior. For this study, only the students' activity levels were recorded. The five basic codes of activity levels used in SOFIT are lying down, sitting, standing, walking, and very active. Most often, interval recording is used to record data using SOFIT. With interval recording, rounds of observations that are usually 20 seconds in length (10 seconds of observation followed immediately by 10 seconds of recording time) are used to maintain observer consistency.

For this study, SOFIT was modified for use in this particular setting. Four activity level codes were developed; resting/sitting, standing/wading, light swimming/treading water, and vigorous swimming. The lying down code was eliminated because that level of activity was not anticipated in the setting; however if it would have been observed, the activity would have been coded as resting. The resting/sitting category was used for very low levels of activity such as sitting on a poolside bench for instruction or leaning on the side of the pool. Standing/walking was used for times when students were either standing outside of the pool or in the water but not expending energy to keep them afloat. Light swimming/treading water coded activity at a moderate level that consisted of performing or practicing swimming strokes without intense exertion or time when students were stationary in deeper water where effort was required to stay above the water's surface. Finally, vigorous swimming was reserved for periods of intense activity such as swimming for time. During observations, the codes were recorded according to the level of physical activity at which the majority (at

least 51%) of the class was participating. Interval recording was used with a 10 second observational period immediately followed by a 10 second recording period. A stopwatch set on a 10 second timer was used to maintain consistency. Five lessons were observed. Each observational session lasted 30 minutes and began when instruction started and physical activity followed.

**Data Analysis**

Data were collected and calculated after each observational session. The number of different teaching strategies used was totaled and the percentage of time spent in each activity level was calculated. At the end of the fifth and final observational session, the total percentage of time spent in each activity level and the average number of teaching strategies used were calculated.

**Results**

The results for this study showed that the average number of strategies the instructor used in a lesson was 9, and students spent 35% of the observed class time at a moderate level of physical activity (See

Table 1). The most strategies observed during one lesson was 11, but this day also had one of the lowest recording percentages of moderate physical activity. The highest percentage of moderate activity recorded was 57%, and in this lesson, 10 of the 16 teaching strategies were observed.

Only four of the strategies (i.e., establishing protocols, instant activity, applying, and closure) were not observed at any time during the study. Five of the sixteen strategies (i.e., demonstration, checking for understanding, extending, refining, and feedback) were seen every day. All other strategies were observed on at least two other days.

The majority (57%) of the observed class time was coded in the standing/wading category of physical activity, but this code was also recorded as low as 28% of one lesson. A very small amount of time (8%) of the total observed class time was spent in the lowest activity category. None of the observed activity was coded for the vigorous level of physical activity.

Table 1 *Number of Teaching Strategies Used and Percentages of Physical Activity by Category*

| Teaching Session                   | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
|------------------------------------|-------|-------|-------|-------|-------|
| Number of Teaching Strategies Used | 11    | 10    | 10    | 8     | 8     |
| <b>Physical Activity Category</b>  |       |       |       |       |       |
| Time Sitting/Resting               | 1%    | 16%   | 16%   | 3%    | 4%    |
| Time Standing/Wading               | 72%   | 51%   | 28%   | 76%   | 57%   |
| Time Light Swimming/Treading Water | 27%   | 33%   | 57%   | 19%   | 39%   |
| Time Vigorous Swimming             | 0%    | 0%    | 0%    | 0%    | 0%    |

**Discussion**

According to the data that were collected for this study, there does not appear to be a strong connection between the number of teaching strategies used and the amount of time spent in moderate to

vigorous levels of physical activity. Unlike the findings of Gao, Lee, Xiang and Kosma (2011), this study did not consistently see an

increase in moderate to vigorous activity levels during instruction. The use of different teaching strategies was fairly consistent throughout the observations, but the percentage of time spent at a moderate intensity level fluctuated greatly. The day with the highest percentage of moderate physical activity was not the day when the most teaching strategies were use. Also, the day with the most teaching strategies used

## INFLUENCE OF DIFFERENT TEACHING STRATEGIES

had one of the lowest moderate physical activity percentages. Further, these data suggest that students did not engage in enough physical activity to incur health benefits per the Healthy People (2010) guidelines of 50% of time spent in moderate to vigorous levels of physical activity. Some of the 16 teaching strategies lend themselves to increasing physical activity (like extending and refining tasks) while some of the strategies (like the set induction and closure) are only for instructional purposes. The fact that some of the teaching strategies were not observed could be explained by set-up of the observations. For example, closure comes at the end of a lesson, and these observations took place during the middle of the instructional session.

This study has several limitations. A limited number of observations were made and the observations occurred during the same segment of every lesson and only covered one-third of the entire instructional time. If the entire instructional time had been observed, this may have also yielded different results such as the use of additional teaching strategies and more time spent active at a moderate intensity. The lessons observed varied greatly in structure and instructional content. There were days that the entire class received instruction together and other days that the class was divided into two or three groups to allow practice time and more individualized instructional opportunities. One day was primarily focused on safety techniques, and others focused mainly on swimming techniques. These differences in class structure and content could have had more of an impact on activity level than the teaching strategies that were implemented.

### Conclusion

This study indicated that, in this setting, using more teaching strategies did not result in higher levels of moderate to vigorous

levels of physical activity. Further research is needed to determine the extent of the effect of implementing more teaching strategies on student activity levels. Future research should provide more exhaustive observations of lessons and their content as well. Also, future observations should document the number of times a strategy is used and cover entire lessons. Therefore, more study and observation is required to accurately determine if using teaching strategies alone can have an effect on student activity levels.

### References

- Bevans, K. B., Fitzpatrick, L. A., Sanchez, B. M., Riley, A. W., & Forrest, C. (2010). Physical education resources, class management, and student physical activity levels: A structure-process-outcome approach to evaluating physical education effectiveness. *Journal of School Health, 80*, 573-580.
- Engstrom, D. (1999). Correlations between teacher behaviors and student evaluations in college level physical education activity courses. *Physical Educator, 56*, 105-112.
- Gao, Z., Hannon, J. C., Newton, M., & Huang C. (2011). Effects of curricular activity on students' situational motivation and physical activity levels. *Research Quarterly for Exercise and Sport, 82*, 536-544.
- Gao, Z., Lee, A. M., Xiang, P., & Kosma, M. (2011). Effect of learning activity on students' motivation, physical activity levels and effort/persistence. *Journal of Research for Health, Physical Education, Recreation, Sport, and Dance, 6*, 27-33.
- Graham, G. (2001). *Teaching children physical Education: Becoming a master teacher* (2<sup>nd</sup> ed.). Champaign, IL: Human Kinetics.

- McKenzie, T. L. (2009). *SOFIT: System for Observing Fitness Instruction Time*. San Diego State University: San Diego, CA.
- McKenzie, T. L., Simon, J. M., Sallis, J. F. & Conway, T. L. (2000). Student activity levels, lesson context, and teacher behavior during middle school physical education. *Research Quarterly for Exercise and Sport*, 71, 249-259.
- Patterson, D. L., & van der Mars, H. (2008). Distant interactions and their effects on children's physical activity levels. *Physical Education and Sport Pedagogy*, 13, 277-294.
- Rink, J. E., & Hall, T. J. (2008). Research on effective teaching in elementary school physical education. *The Elementary School Journal*, 108, 207-218.
- Silverman, S. (1991). Research on teaching in physical education. *Research Quarterly for Exercise and Sport*, 62, 352-364.
- Slingerland, M. & Borghouts, L. (2011). Direct and indirect influence of physical education-based interventions on physical activity: A review. *Journal of Physical Activity and Health*, 8(6), 866-878.
- U.S. Department of Health and Human Services. (2008). *Physical activity guidelines for Americans*. Retrieved on June 29, 2012 from [www.health.gov/paguidelines](http://www.health.gov/paguidelines)
- U.S. Department of Health and Human Services (2012). Summary health statistics for U.S. adults: National Health Interview Survey, 2010. Retrieved On June 29, 2012 from [http://www.cdc.gov/nchs/data/series/sr\\_10/sr10\\_252.pdf](http://www.cdc.gov/nchs/data/series/sr_10/sr10_252.pdf)
- U.S. Department of Health and Human Services. (n.d.). *Healthy people 2010: What is healthy people?* Retrieved from <http://www.healthypeople.gov/About/whatis.htm>
- Weimar, W. H., Martin, E. H., & Wall, S. J. (2011). Kindergarten student's qualitative responses to different instructional strategies during the horizontal jump. *Physical Education and Sport Pedagogy*, 16, 213-222.

**Derrick Bass** is a graduate student in Health and Physical Education and is a member of the Hughston Fellowship program. He graduated from Arkansas State University with a B.S. in Athletic Training and is the head athletic trainer for Kendrick High School.

**Dr. Ellen H. Martin** is a Professor in Health and Physical Education. Her research centers on investigating motivational climates created by teachers in their classrooms.