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PEDAGOGY

An Assessment of Student Learning and Instructional Methods in a Golf Skills Physical Education Course at a Public University

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Abstract

Inquiries have shown that students enroll in sport skills courses in college to learn a new activity, have fun, improve skills, and increase physical activity. However, physical education course requirements at 4-year universities have hit an all-time low. This study assessed learning in and student perceptions of a university golf physical education course. Student goals, instructor feedback, and course structure were examined. Twenty-one students enrolled in a university beginner golf class were surveyed about their knowledge and experience in the course. Participants were given a survey related to basic golf knowledge that featured questions that were derived from material in the course textbook and created in collaboration with the course instructor. Participants also completed a survey related to instructional methods. It was developed in collaboration with motor learning experts and assessed perceptions of instruction. Primary student goals included improving swing technique and ball flight. To improve the class, participants suggested a smaller class with more individual instruction, an increased focus on driving, and an allocation of time for playing

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rather than solely practicing. This assessment provided evidence that a golf skills class significantly increased basic golf knowledge, along with self-ratings of knowledge and interest in the sport. These findings provide evidence for benefits of participating in golf skills courses, suggest that such activity courses can be effective at increasing a person's disposition toward participation, and elucidate areas for improvement.

Students at many colleges and universities have the opportunity to participate in physical education courses in a diverse array of sports and activities. Examples range from sports such as golf, softball, and soccer to activities such as dance, yoga, and conditioning. Research has shown that students enroll in such courses to learn a new activity, have fun, improve skills, and increase physical activity (Leenders, Sherman, & Ward, 2003). Students in these courses can learn new skills with formal instruction in a structured environment, and they can take a break from the traditional, quotidian classroom setting. For example, one program website from a state-sponsored, Southeastern university describes the role of physical education courses:

> Sport, dance, and exercise are essential parts of our culture and contribute significantly to healthy and satisfying lifestyles for people of all ages. It is our goal to provide opportunities for the university community in a variety of exercise/performance activities from a theoretical and practical base that will bring enjoyment while teaching the essentials for successful participation. ("Kinesiology, Recreation, and Sport," 2013, Physical Education Activity Program section, para. 1)

However, while these classes can offer benefits to students, physical education course requirements at 4-year universities in America have hit an all-time low, suggesting a decline in an emphasis on participation in such courses (Cardinal, Sorenson, & Cardinal, 2012).

Research concerning physical education courses has not explored sport-specific course outcomes to examine if benefits such as knowledge and feelings of interest are being conferred to students. For the assessment of whether students are learning a new skill adequately, a class tailored to novices should be chosen. Ideally, the activity in question should challenge the learner to increase knowledge

regarding a variety of materials to perform successfully in the course, and participation in the activity should have the potential to confer health benefits. Based on the aforementioned criteria, a beginner golf class was chosen for this study. As research has suggested, golf can be a challenging skill to learn, and walking a typical 18-hole round of golf can yield a step count of approximately 12,000 steps, which exceeds the general 10,000-step recommendation for health benefits (Iwane et al., 2000; Kobriger, Smith, Hollman, & Smith, 2006; Lindsay & Vandervoort, 2014). During an interview with the Physical Education Activity Program director of a Southeastern university, three goals of the golf class were established:

1. to learn tactical knowledge about golf such as rules, etiquette, and strategy;
2. to learn technical knowledge about golf and have some type of reliable swing pattern; and
3. to make new friends and meet people in a golf setting. (E. Catignani, personal communication, September 28, 2012)

In accordance with these outcomes, golf instructors are expected to have prior golf experience and be familiar with the tactical and technical aspects of the game. Golf classes are similar to other physical education classes that require students to learn a new skill: Students are expected to develop fundamental skills from the beginning level through teaching techniques such as verbal instruction, demonstration, and practice (Schmidt & Lee, 2013).

One interesting aspect of the sport of golf is that while it can be enjoyed by men and women, there is a discrepancy in the levels of participation, with significantly and consistently higher numbers of men choosing to play than women (Newport, 2010). Such differences have been attributed to the institutional (i.e., societal) and interactional barriers that females may face when attempting to learn or play golf. Examples of societal barriers include sexism in the form of unwelcoming staff or players at courses; feelings of being ignored, overlooked, or unimportant on golf courses; or instances of verbal or physical sexual harassment (McGinnis, McQuillan, & Chapple, 2005). Because of this difference in participation levels and the persistence of barriers that may be fueling such a discrepancy, an examination of potential sex differences in areas such as course

content knowledge or perceptions of instructional methods could be worthwhile.

Research in motor learning suggests that certain pedagogical methods and practice environments are more conducive to learning, particularly for novices, compared with alternative approaches (Magill & Anderson, 2013). By establishing the structure, content, and atmosphere of practice, an instructor plays a key role in determining how well students learn. Elements of practice such as format (e.g., blocked or random practice), attentional direction (e.g., broad vs. narrow or external vs. internal), and feedback (e.g., content, timing, or delivery) can play a significant role in performance during practice and subsequent learning. Therefore, these important pedagogical aspects should be examined and discussed.

This study evaluates the overall effectiveness of instructional methods in a single golf activity course and offers insight into student learning and perceptions of course content. This study seeks to answer two main questions:

- In this course, are novice participants learning basic knowledge related to golf? Specifically, are students learning tactical knowledge such as rules, etiquette, and strategy, and are they learning technical knowledge such as proper swing mechanics?
- In this course, what is the methodology by which students are learning, and what are their perceptions of these methods? Specifically, what is the content and structure of practice, and are students satisfied or dissatisfied with the various aspects of this approach?

Method

Participants

Participants included 21 students enrolled in a beginner golf activity course at a Southeastern public university. This study was approved by the university internal review board, and all participants signed an informed consent agreement prior to participating in data collection. The average age of participants was 22 years old, with a range from 18 to 24 years. Sixteen students were male and five were female. Participants' responses to survey instruments were kept confidential and anonymous.

Design

This study utilized a pretest–posttest qualitative design to assess students' golf knowledge and the instructional methods (posttest only) of a beginner golf activity course. Students completed a pretest survey related to their knowledge of golf prior to the start of course instruction and a posttest survey related to their knowledge of golf after completing the course. This assessment tool, termed the Golf Knowledge Survey (GKS), featured questions about demographics, course interest, and course material. Questions about course material were created in collaboration with the instructor, based on information from the course textbook (McCord, 2011), and were derived from assessment instruments that had been used in the course in previous semesters. For the purposes of comparison and ruling out the possibility of maturation effects, a control group in a physical education course unrelated to golf was assessed on the GKS at the beginning and end of an 8-week period. During the posttest, students in the golf class also completed an Instructional Methods Survey (IMS), which was designed to provide insight into course structure and content and into student perceptions of these areas. Question formatting, structure, and content were based on research of classroom assessment techniques (Angelo & Cross, 1993; Wright, 2008).

Procedure

Pretest survey data were collected from the golf class and the control group on the first day of class. Participants filled out the GKS and answered open-ended questions related to their golf knowledge. For results from the GKS at both time points to be connected, each participant was assigned a random identification number. The posttest survey was administered at the conclusion of instruction, which took place over 8 weeks, and featured the same questionnaire related to golf knowledge. In addition to the GKS, participants also filled out the IMS during this time.

Data Analysis

Golf knowledge. Descriptive information was averaged for each category. For an analysis of performance on the GKS, students' pretest and posttest surveys on golf knowledge were scored out of

100 points (i.e., similar to a midterm or final examination that might occur in such a course). Scores were then compared for significant differences from the pretest to the posttest via a dependent samples *t* test. Alpha levels were set at .05.

Instructional methods. For an analysis of performance on the IMS, scores on Likert scale questions were averaged for each question. For open-ended survey questions, two independent raters coded themes, and response patterns and consistencies were determined.

Results

Descriptive Information

Participants' average self-rating of golf knowledge during the pretest was 3.05 (SD = 1.43) on a Likert scale from 1 to 7, while the average self-rating of golf knowledge on the posttest was 4.43 (SD = 1.26). A dependent samples *t* test revealed among participants significantly higher self-ratings of golf knowledge on the posttest, $t(20) = 5.26$, $p < .001$. Participants also rated their interest in the game of golf. Participants' average self-rating of golf interest during the pretest was 5.00 (SD = 1.18) on a Likert scale from 1 to 7, while the average self-rating of golf interest during the posttest was 5.68 (SD = 1.20). A dependent samples *t* test revealed among participants significantly higher self-ratings of golf interest on the posttest, $t(20) = 3.84$, $p = .001$. Finally, participants rated their interest in the class. Participants' average self-rating of class interest during the pretest was 5.33 (SD = 1.06) on a Likert scale from 1 to 7, while their self-rating of class interest during the posttest was 5.71 (SD = 1.10). An dependent samples *t* test revealed that participants' increase in class interest was not significant, $t(20) = 2.02$, $p = .057$. Table 1 shows a summary of these data.

Table 1
Self-Perceptions of Golf Knowledge, Golf Interest, and Current Class Interest

	Pretest		Posttest	
Variable	***M***	***SD***	***M***	***SD***
Golf Knowledge	3.05	1.43	4.43	1.12
Golf Interest	5.00	1.26	5.67	1.20
Class Interest	5.33	1.06	5.71	1.10

Data were also analyzed for sex differences in the aforementioned ratings. Pretest results revealed that females demonstrated significantly lower self-ratings of golf knowledge (M = 1.80, SD = 1.30) than males did (M = 3.44, SD = 1.26), $t(19) = 2.51$, $p = .021$. However, posttest results showed no significant differences of self-ratings of golf knowledge between females (M = 3.60, SD = 1.67) and males (M = 4.69, SD = .79), $t(19) = 2.037$, $p = .056$. Pretest results further revealed that females demonstrated significantly lower self-ratings of golf interest (M = 4.00, SD = 1.58) than males did (M = *5.31*, SD = 1.01), $t(19) = 2.21$, $p = .039$. However, posttest results showed no significant differences of self-ratings of golf interest between females (M = 4.80, SD = 2.05) and males (M = 5.94, SD = .68), $t(19) = 1.99$, $p = .062$. With regard to class interest, males and females showed no significant differences at pretest, $t(19) = 1.87$, $p = .087$, or posttest $t(19) = 1.21$, $p = .241$.

Golf Knowledge Survey

Participants' average score on the pretest was generally low (M = 51.30, SD = 12.43) and ranged from 24 to 72. Participants' average performance improved on the posttest (M = 63.22, SD = 13.24) and ranged from 45 to 93. Sixteen individuals improved on the posttest, while five individuals performed worse. A dependent samples t test revealed a significant improvement in golf knowledge scores, $t(20) = 3.68$, $p = .001$. Control participants' average score on the pretest was generally low (M = 50.72, SD = 10.93) and ranged from 28 to 69, while control participants' average performance on the posttest showed little change (M = 50.74, SD = 13.67) and ranged from 24 to 69. A dependent samples t test revealed no change in these scores related to golf knowledge, $t(24) = -.008$, $p = .994$. Figure 1 shows a summary of these data. Additional analyses were performed on data from individuals in the golf class and potential sex differences were examined. Results indicated similar scores on the pretest for females (M = 48.25, SD = 12.91) and males (M = 53.86, SD = 12.40), $t(19) = .875$, $p = .393$, but significantly different scores on the posttest such that females (M = 49.63, SD = 7.15) scored lower than males (M = 67.47, SD = 11.80), $t(19) = 3.169$, $p = .005$. Figure 2 shows these results.

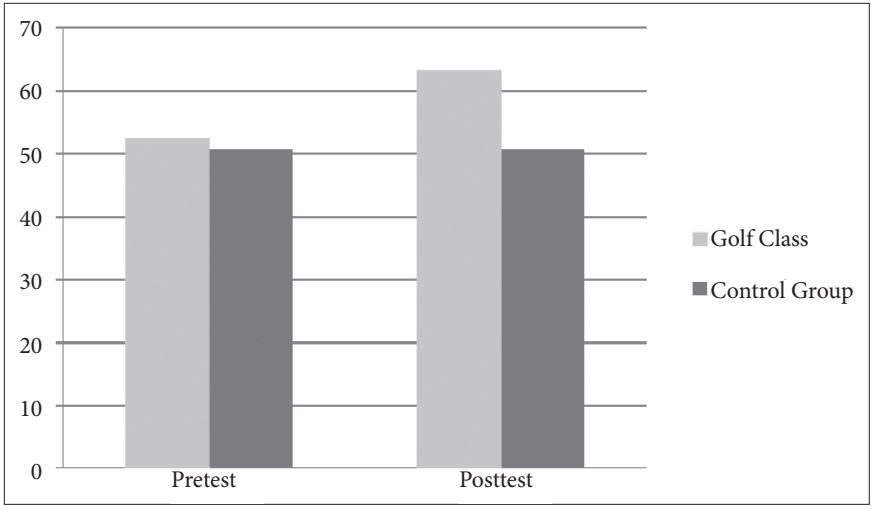

Figure 1. Pretest and posttest scores from the GKS for a golf class and a control group.

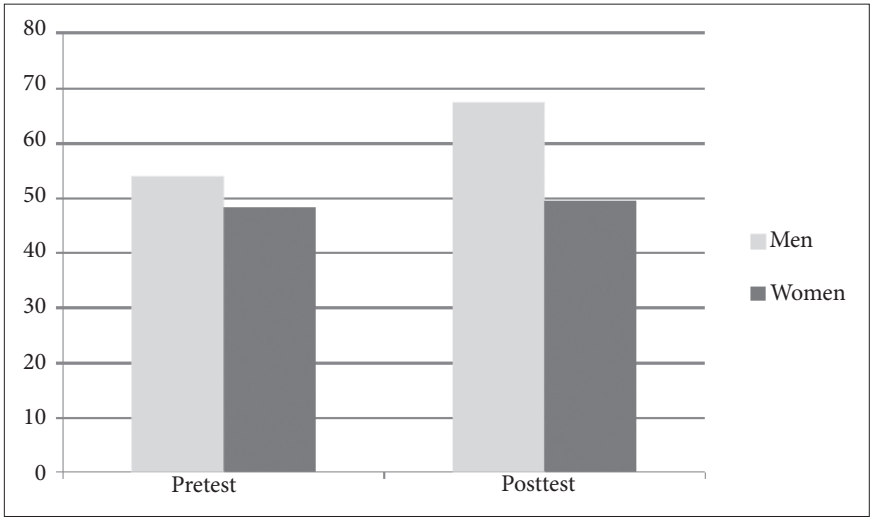

Figure 2. GKS scores by sex for a beginner golf class.

Instructional Methods Survey

Participants' scores on the quantitative questions were recorded and averaged, which provided an indication of students' opinions concerning the quality and substance of instructional methods in the class. Students, on average, reported having 1 to 2 absences throughout the term ($M = 1.14$, $SD = .96$) with a range from 0 to 3 absences. Results generally indicated that participants would start putting during the beginning of class to warm up for 5 to 10 min prior to the day's lesson. After the lesson, half of the class would remain on the putting green to practice putting, while the other half of the class would go to the driving range and practice with wedges or irons. At the midpoint of class, the two groups would switch roles. Participants reported practicing putting and hitting irons on the range the most and chipping and hitting drivers the least. Student goals revolved around learning the fundamentals of the game and improving areas such as swing techniques, contact, or ball flight. A majority of participants ($n = 14$) reported an internal focus of attention ("executing the correct movements"), while four reported an external focus of attention ("outcome of the shot"). The remainder ($n = 3$) focused on both of these. A majority of participants ($n = 13$) reported receiving reinforcing (i.e., positive) and corrective feedback from the instructor. Two participants reported receiving mostly reinforcing feedback, while six students reported receiving mostly corrective feedback. With regard to the strengths of the instructor, students indicated that the instructor was knowledgeable about the subject matter and good at providing instruction and explaining techniques. With regard to improving the class, participants generally reported having a smaller class size for more one-on-one instruction, increasing the instructional time related to driving and chipping, and providing class time to play holes on the course rather than focusing only on practice.

Discussion

The results of this evaluation of a golf activity course provide insight into the knowledge students gained in the class and the instructional methods that were used to teach students. Results indicated that students significantly increased their knowledge base with regard to subjects such as tactical and technical knowledge related to golf, and they demonstrated a significant increase in self-reported

scores of golf knowledge and golf interest. This suggests that the golf class helped students prepare to play and practice golf in the future, and based on the increased self-reported interest in golf, these students may be more likely to continue playing than they were at the start of the course. Because golf provides physical activity and recreational enjoyment, this class could help students become more physically active through engagement in a lifelong sport that is challenging, enjoyable, and social (Haskell et al., 2007; Palank & Hargreaves, 1990; Parkkari et al., 2000; Versteegh, Vandervoort, Lindsay, & Lynn, 2008). As reported by Moore, Harris, Carlson, Kruger, and Fulton (2012), 1 in 4 U.S. adults reports that they engage in no leisure-time physical activity, and such a class could encourage participation in leisure-time physical activity.

However, while this improvement in knowledge scores is significant, the mean scores of the posttest still remain low. This result may indicate a need for instructors to emphasize such material during class, but it may be due to time constraints or the complexity of the game of golf. As the data suggested, the instructor spent most of the class time on certain elements of the game while neglecting others, based on the students' opinions. Presumably, these aspects were emphasized because of their perceived importance to the instructor. Material from a textbook may be read and studied independently, but movement patterns may be shaped with feedback during class. As a result, it seems appropriate for instructors to focus on the latter aspect of golf in class rather than rules or etiquette. As novice players attempt to learn golf, it is necessary for players to balance the amount of time spent engaged in physical practice and the amount of time spent learning rules or strategy, and the acquisition of this knowledge may require more time than an activity course can provide over a semester.

It was interesting that females generally displayed lower levels of self-reported golf knowledge and golf interest prior to the class than males, while the two groups displayed similar levels of these two measures after the class. These results indicate that females increased their self-perceptions of knowledge and interest to levels similar to males, and females may have the most to gain from such a class in these areas because of initial differences in motivation, self-efficacy, or perceived competence related to golf (McAuley & Blissmer, 2000;

Williams & Gill, 1995). Results on the GKS, however, indicated that both groups performed similarly on the pretest, while females performed significantly worse on the posttest than males. While ascertaining the potential reasons behind these findings is difficult, they raise some concerns. In future classes, it might be beneficial for researchers to explore the possibility of establishing an all-female class to increase accessibility to a predominantly male class. Such a class might be more likely to increase engagement in course topics and encourage relevant discussion. Research has shown positive effects in other predominantly male disciplines such as mathematics, engineering, and computer science (Crombie, Abarbanel, & Trinneer, 2002; Wood & Brown, 1997). It would be interesting to examine if similar positive effects may be observed in activities such as golf.

Based on students' accounts of the use of class time and the structure of practice, putting was practiced the most and students generally found this activity beneficial to overall learning and performance. However, it is recommended that to gauge interest, instructors focus class instruction more on underemphasized skills such as chipping and driving so that novice students can achieve a well-rounded experience of the game. Student goals were generally focused on novice techniques and improving fundamentals and thus in line with the scope of the class. With regard to other improvements to the class, it is recommended that the maximum enrollment of the class be limited, if possible, and extra sections added for the instructor–student ratio to be reduced. Such a reduction would provide the instructor with more time to work individually with students and provide specific, one-on-one feedback for improvement. Research in physical education and other academic areas has shown that smaller class sizes tend to produce better learning outcomes (Hastie & Saunders, 1991; Schwarz, Schmitt, & Lose, 2012). Additionally, it is recommended that future instructors consider utilizing a portion of class time to have students engage in playing golf rather than only practicing on a driving range. Playing a few holes might help reduce the monotony of practice and further expose novices to a new experience in the areas of physical activity and leisure or recreation.

Motor learning research suggests that instructors should utilize a random practice structure, instead of temporary performance, to facilitate learning and better simulate the conditions of sport (Schmidt & Lee, 2013). During golf practice on the range, however, it is common for players to hit with the same club or shot repeatedly and engage in a blocked practice style, which may be useful for building confidence on the range, but transfer poorly to the course under playing conditions. Attentional focus research has suggested that learners should adopt an external attentional focus to reduce constraints upon the motor system and improve skill performance (Wulf, 2007). However, in this study, a majority of novice golfers were concerned with their own body movements and thus held an internal focus of attention. Instructors should strive to have students maintain an external focus of attention while practicing even though they may have to draw attention to specific body parts to correct technical or mechanical flaws. Finally, the majority of participants in this study reported receiving reinforcing and corrective feedback, which suggests an instructional style that trends toward a balanced approach, which can have benefits for learning (Cox, 2011). However, with so many critical variables that the instructor needs to consider in providing effective feedback, such as type, timing, frequency, and format (see Salmoni, Schmidt, & Walter, 1984, for a review), it is difficult for the experimenter to determine without direct observation if the instructor was providing effective feedback for learning.

Limitations

This study focuses on outcomes related to a single university golf activity course, and thus, it is unclear if these results generalize to other activity courses. The experimenter utilized previous research in survey design to guide the wording and content of the surveys utilized in this study and consulted with experts in relevant areas, such as a golf instructor regarding content of a knowledge exam and an expert in motor learning regarding instructional methodology. However, the two surveys utilized in this study have not been rigorously tested for reliability and validity and were designed solely for the purpose of this study. Further examination of these instruments needs to determine if their content or format could be applicable to

other golf or activity classes. Additionally, the pedagogical methodology examined in this course was based on the preferences of a single instructor. While this study provides insight regarding the methods utilized in this course, it should be noted that there are diverse ways of teaching motor skills, and thus, these results may not generalize to other instructors. Finally, the number of female participants in this study was limited in comparison to male participants. As a result, it is difficult for the experimenter to draw conclusions regarding sex differences, and future research with more participants needs to address this question.

Practical Applications

The popularity of golf has declined in America in recent years, with fewer individuals willing to invest the time and money to engage in learning the game or playing a full round of 18 holes (Greenfield, 2015; Stachura, 2017). Additionally, current trends suggest that fewer business deals are being conducted on the course, as Americans opt for other avenues to fulfill business and/or leisure needs (Burke, 2017). Based on these trends, changes have occurred in the golfing community to increase participation, such as the USGA introducing its Play 9 campaign in 2014, courses relaxing rules such as those related to dress code, and country clubs adding amenities to increase the allure of membership. In the early 2010s, overall golf participation among individuals aged 18 to 34 was down 5%, compared to the 1990s. This age range could be critical for getting individuals to learn the game and become interested while they are still relatively young in terms of physical age and career pursuits. Golf physical activity courses in higher education could be an important instrument through which the rules, etiquette, and technical skills can be properly taught. Additionally, these types of classes could be a catalyst for stimulating lifelong interest in the sport. Due to these ramifications, it is important that instructors and coaches in such roles understand the needs and perceptions of their students to improve participant satisfaction. Additionally, it is important that instructors and coaches understand fundamental principles of motor learning to improve the quality of instruction and maximize the benefits and efficiency of limited resources such as class time or course utilization.

Conclusions

This study evaluated the instruction and student perception of a golf physical activity course by examining learning outcomes in the form of a content-related exam, instructor methods in the form of a survey related to practice structure, and student feedback in the form of a survey related to course strengths and recommendations for change. From a pedagogical standpoint, it is important for instructors to examine these areas to ensure that students who enroll in such courses receive content knowledge and a positive experience. From a motor learning perspective, it is important for instructors to utilize a practice structure that is most appropriate for the learner and conducive to improvement. Based on the results of this study, a golf activity course can be a medium through which students can significantly increase their fundamental knowledge and interest in the game of golf. These attributes could influence participation rates in the future and lead to higher levels of physical activity or leisure enjoyment. Additionally, some avenues for improving such a course might be a smaller instructor–student ratio and a greater focus on progressing toward playing the game rather than simply practicing. Future research should examine similar outcomes in other activity courses to determine if these results are generalizable to other sports or if there are specific differences. Additionally, more research needs to examine differences in participation levels and experiences across demographic factors such as sex, race or ethnicity, and skill level.

References

Angelo, T., & Cross, P. (1993). *Classroom assessment techniques: A handbook for college teachers.* San Francisco, CA: Jossey-Bass.

Burke, K. (2017, March 29). Playing golf has gone the way of the three-martini lunch – Trump being the exception. Retrieved from http://www.marketwatch.com

Cardinal, B. J., Sorensen, S. D., & Cardinal, M. K. (2012). Historical perspective and current status of the physical education graduation requirement at American 4-year colleges and universities. *Research Quarterly for Exercise and Sport*, *83*, 503–512. https://doi.org/10.1080/02701367.2012.10599139

Cox, R. (2011). *Sport psychology: Concepts and applications* (7th ed.). New York, NY: McGraw-Hill Education.

Crombie, G., Abarbanel, T., & Trinneer, A. (2002). All-female classes in high school computer science: Positive effects in three years of data. *Journal of Educational Computing Research, 27*, 385–409. https://doi.org/10.2190/VRD4-69AF-WPQ6-P734

Greenfield, K. T. (2015, June 25). The death of golf. Retrieved from http://www.mensjournal.com

Haskell, W. L., Lee, I. M., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A., . . . Bauman, A. (2007). Physical activity and public health: Updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Circulation, 116*, 1081–1093. https://doi.org/10.1161/CIRCULATIONAHA.107.185649

Hastie, P. A., & Saunders, J. E. (1991). Effects of class size and equipment availability on student involvement in physical education. *Journal of Experimental Education, 59*, 212–224. https://doi.org/10.1080/00220973.1991.10806561

Iwane, M., Arita, M., Tomimoto, S., Santani, O., Matsumoto, M., Miyashita, K., & Nishio, I. (2000). Walking 10,000 steps/day or more reduces blood pressure and sympathetic nerve activity in mild essential hypertension. *Hypertension Research, 23*, 573–580. https://doi.org/10.1291/hypres.23.573

Kinesiology, Recreation, and Sport Studies Physical Education Activity Program. (2013). Retrieved from http://krss.utk.edu/physical-education-activity-program-peap/

Kobriger, S. L., Smith, J., Hollman, J. H., & Smith, A. M. (2006). The contribution of golf to daily physical activity recommendations: How many steps does it take to complete a round of golf? *Mayo Clinic Proceedings, 81*, 1041–1043. https://doi.org/10.4065/81.8.1041

Leenders, N. Y. J. M., Sherman, W. M., & Ward, P. (2003). College physical activity courses: Why do students enroll, and what are their health behaviors? *Research Quarterly for Exercise and Sport, 74*, 313–318. https://doi.org/10.1080/02701367.2003.10609096

Lindsay, D. M., & Vandervoort, A. A. (2014). Golf-related low back pain: A review of causative factors and prevention strategies. *Asian Journal of Sports Medicine, 5*(4). https://doi.org/10.5812/asjsm.24289

Magill, R., & Anderson, D. (2013). *Motor learning and control: Concepts and applications* (10th ed.). New York, NY: McGraw-Hill.

McAuley, E., & Blissmer, B. (2000). Self-efficacy determinants and consequences of physical activity. *Exercise and Sport Science Review, 28*(2), 85–88.
McCord, G. (2011). *Golf for dummies* (4th ed.). Indianapolis, IN: Wiley.
McGinnis, L., McQuillan, J., & Chapple, C. L. (2005). I just want to play: Women, sexism, and persistence in golf. *Journal of Sport and Social Issues, 29*, 313–337. https://doi.org/10.1177/0193723504272659
Moore, L. V., Harris, C. D., Carlson, S. A., Kruger, J., & Fulton, J. E. (2012). Trends in no leisure-time physical activity—United States, 1988–2010. *Research Quarterly for Exercise and Sport*, *83*, 587–591. https://doi.org/10.1080/02701367.2012.10599884
Newport, J. P. (2010, April 9). Golf searches for its feminine side: A new study sheds light on why women get turned off by the game. *Wall Street Journal*. Retrieved from http://online.wsj.com/
Palank, E. A., & Hargreaves, E. H. (1990). The benefits of walking the golf course: Effects on lipoprotein levels and risk ratios. *Physician and Sportsmedicine, 18,* 77–80. https://doi.org/10.1080/00913847.1990.11710155
Parkkari, J., Natri, A., Kannus, P., Mänttäri, A., Laukkanen, R., Haapasalo, H., . . . Vuori, I. (2000). A controlled trial of the health benefits of regular walking on a golf course. *American Journal of Medicine, 109*, 102–108. https://doi.org/10.1016/S0002-9343(00)00455-1
Salmoni, A. W., Schmidt, R. A., & Walter, C. B. (1984). Knowledge of results and motor learning: A review and critical appraisal. *Psychological Bulletin, 95*, 355–386. https://doi.org/10.1037/0033-2909.95.3.355
Schmidt, R. A., & Lee, T. D. (2013). *Motor learning and performance* (5th ed.). Champaign, IL: Human Kinetics.
Schwarz, R. M., Schmitt, M. C., & Lose, M. K. (2012). Effects of teacher–student ratio in response to intervention approaches. *Elementary School Journal, 112*, 547–567. https://doi.org/10.1086/664490
Stachura, M. (2017, April 22). The NGF's annual golf participation report uncovers favorable trends for the game's future. Retrieved from http://www.golfdigest.com

Versteegh, T. H., Vandervoort, A. A., Lindsay, D. M., & Lynn, S. K. (2008). Fitness, performance, and injury prevention strategies for the senior golfer. *Annual Review of Golf Coaching, 2,* 199–214. https://doi.org/10.1260/174795408785024162

Williams, L., & Gill, D. (1995). The role of perceived competence in the motivation of physical activity. *Journal of Sport and Exercise Psychology, 17*, 363–378. https://doi.org/10.1123/jsep.17.4.363

Wood, B. S., & Brown, L. A. (1997). Participation in an all-female algebra I class: Effects on high school math and science course selection. *Journal of Women and Minorities in Science and Engineering, 3*, 265–277. https://doi.org/10.1615/JWomenMinorScienEng.v3.i4.40

Wright, R. J. (2008). *Educational assessment: Tests and measurements in the age of accountability*. Los Angeles, CA: Sage. https://doi.org/10.4135/9781483329673

Wulf, G. (2007). *Attention and motor skill learning*. Champaign, IL: Human Kinetics.