Abstract

The present study aimed at the evaluation of the M.Sc physical education program in public sector institutions in the context of teacher educators. The objectives of the study were (a) to evaluate the M.Sc Physical Education Program in public sector universities and colleges on the basis of CIPP, (b) to explore the strengths and weaknesses of the M.Sc Physical Education Program in Pakistan and (c) to suggest measures for further improvement of the M.Sc Program in Pakistan. A validated 44 items questionnaire for teacher educators was used for the collection of data. A Chi-square test was applied to the collected data. It was recommended that regular seminars and sports workshops might be organized to improve the research and report writing skills. It was also recommended that proper provision of physical facilities and sports infrastructure might also be provided to improve deficient aspects of the program.

Key Words: Physical Education, Public Sector Institutions, Teachers

Introduction

The importance of physical education is an important topic in today’s society, with the emphasis being put on the benefits of health and wellness education in the modern world. Students who study Health and Physical Education, movement and sports studies, and other wellness-related programs go on to make a difference in the lives of those around them, whether it’s as a coach, a leader in a recreational facility, a Physical Education teacher, or athletics administrator. The need for physical education continues to be prominent, as it will develop and enhance the knowledge and skills of its students to provide them with the potential to make a significant contribution to the sport and education industries.

According to Naismith (2013), physical education is recognized as an essential part of general education. The survival of humanity is, first and foremost, physical. The first lesson a human child that he learns is how to move, and that is physical activity. In the modern era, physical education received much more importance and attention than ever. The term physical education is much broader and much meaningful for day-to-day living. It is more closely allied to the large area of education of which it is a vital part. According to Mughal (2003, P.217), “Physical education is the part of education which deals with physical activities and the relationship between general education and Physical education is part and parcel.” Health and Physical Education Program under experienced leadership contributes to the improvement of an individual’s life because Physical Education is that phase of the whole process of education, mainly concerned with the development of human personality mentally, socially, and emotionally.

A physically fit person can provide good results with minimum efforts. The vitality of physical fitness has always been acknowledged. The reading nations of the world prove the benefits, utility and importance of physical fitness. Physical education is the basic need of our daily life. To improve the ability of work and overall...
Development of personality, physical education is the only source to overcome all the aspects of life (Fiske & Ladd, 2004).

The Master Program of Health and Physical Education at post-graduate institutions can lead to different career outcomes. Before applying for admission, the students must compare their career goals with program offerings at the institutions. Aspiring physical education teachers should look for the colleges and universities that offer an M.Sc in physical education. The aspirant students should also make sure whether their degree of Health and Physical Education enables them for state licensure as a public school teacher. Other students can look for a career in fitness instruction or personal coaching (Asif, 2004).

New trends and issues are emerging in Physical Education and Sport Sciences at the global level. To compete with the global demands, our institutions have to maintain the quality and standard of Health and Physical Education and Sports Sciences at the university level. Therefore the researcher intends to evaluate the postgraduate programs of Physical Education and Sport Sciences in Pakistan. According to Cooper (2005, p.29), “The basic goal of the Health and Physical Education program is to train the students for the challenges of the twenty-first century by giving opportunities to achieve the talents and information to be physically active as a part of a healthy lifestyle”. Students have to become competent in movement forms, motor and social skills, and learn to relish physical activity whereas not compromising safety. Students ought to derive developmental and individual meaning from movement and pleasure as they get skills in movement ability.

Statement of the Problem
Physical education is a vast field of knowledge, and some institutions offer this program at the master level. This program is run under the umbrella of the Higher Education Commission in Pakistan. There has been very little research in the field of Health and Physical Education, especially regarding the evaluation of the program. Evaluation is very important for the improvement of any educational program. It is an evaluation that guides us towards improvement. It was important to look into the quality and practices of the programs of Physical Education offered at the master level in Pakistan to determine whether or not the process and product are meeting the quality standard. Keeping in view the importance of Health and Physical and evaluation, the researcher conducted the research titled “Evaluation of MSc Physical Education program in public sector institutions”.

Objectives of the Study
The following objectives are set up for this research study.

1. To analyze the perspective of the M.Sc Physical Education Program in Public sector universities and colleges.
2. To analyze the facilities and infrastructure for M.Sc Physical Education Program in Public sector universities and colleges
3. To find out the process of implementation of curriculum and instruction in M.Sc Physical Education Program in Public sector universities and colleges
4. To examine the output of the M.Sc Physical Education Program in Public sector universities and colleges

Research Questions
1 a. To what extent the objectives of the M.Sc Health and Physical Education Program are balanced?
1 b. To what extent the objectives of the M.Sc Health and Physical Education Program are aligned with international standards?
2 a. Whether or not sufficient human resources have been provided for the implementation of the M.Sc Health and Physical Education Program?
2 b. Whether or not the ICTs facilities and gymnasium is available for students?
3 a. Whether or not the teachers and students utilize ICTs for making the teaching and learning process more effective?
3 b. To what extent the reliability of the current evaluation system is satisfied?
4 a. To know whether or not M.Sc (HPE) program is according to the needs and demands of society?
4 b. Whether or not the M.Sc (HPE) program is job oriented?
5. To find out whether or not the M.Sc (HPE) program is promoting the quality and standards of sports?

This study may help in highlighting the importance of the Health and Physical Education Program. This study may help by citing standards for the teaching in Health and Physical Education Program. This study may help to make clear what is the existing quality of the teachers and what efforts are required to achieve the outcomes of the Health and Physical Education Program at the post-graduate level in Pakistan as it will analyze the perceptions and views of the Hods. This study may help the policymakers in the execution of educational policies concerning future job satisfaction and ensuring the quality and standard in physical education at the post-graduate level in Pakistan. The finding of the study may be beneficial for educators in the field of Physical Education and planners in the field of education offering M.Sc (HPE) as it will identify the problems faced by the students and faculty members. This study will be also beneficial for the researchers in the field of Physical Education as it will evaluate the existing curriculum of the M.Sc Health and Physical Education program and would serve as a base for further researches in this field. This study is beneficial for the institutional heads, policymakers and stakeholders to bring the necessary changes for further improvement and development of the physical education program at the post-graduate level.

Delimitation of the Study
The study was delimited to:

- Public sector Universities and Colleges of Khyber Pakhtunkhwa
- Curriculum and instruction of the Program.

Limitation of the Study
In the present study, only perceptions of teachers and sport managers have been used (with an assumption that respondents are unbiased) to evaluate the M.Sc program of health and physical education due to limited time and resources. Therefore, all data in this study was self-reported. As self-administered questionnaires have a drawback to pose difficulty in validating the respondents’ answers, therefore there is a chance that respondents may have over-reported socially desirable indicators and underreported undesirable indicators of the program under evaluation. This may have led to a one-sided finding that the M.Sc program of health and physical education is running with the most strength and least weaknesses. Thus, in further studies regarding this program, direct observations and document analysis may be used to avoid the mono-method bias and not to rely solely on subjects' reports.

Review of Literature
The word physical refers to the body. Various bodily features such as physical strength, physical health, physical development, and physical appearance are used in reference to the term physical. It denotes the body as compared to the mind. Therefore, when the word education is added to it and the word physical education is used, it states the process of education that concerns actions that maintain and develop the human body (Stroebe & Stroebe, 1987).

As for as the definition of PE is concerned, many leaders in this field have defined this term in different ways. Mughal (2003) defines this important discipline as “Physical Education is an important segment of education which is presided over physical activities; it is not separate or partially related field” (p-13). Bucher (1972) regarded physical education as an essential part of the total education process, he defined it as a field of venture that aims to the development of physically, mentally, emotionally, and socially fit citizens through the medium of physical activities that have been selected with a view to realizing these outcomes.

Physical education is acknowledged as a fundamental part of education. Man existence is basically physical. The foremost lesson a human child learns is the lesson of physical activity. At the exact point in time in the history of human civilization, did physical education receive so much importance and attention as today (Kirk, 2009)? The march of civilization characterized by fast industrialization and urbanization has brought the man to the verge of disaster. His robot-like routines leading to psychosomatic disorders is the unavoidable consequence of the
scientific and Cultural Revolution. The only silver lining in “dark hours of degraded life” is vigorous physical activity, which surely can bring back the joy of living (Mughal, 2003, p.17).

Sports and Physical Education enhance development in the physical, cognitive, and social domains by creating opportunities. Moral reasoning or character development is the aspect of the social domains. According to Solomon (1997), art and PE settings are ripe with opportunities to promote character development: (1) as issues spontaneously arise, address the moral implications of behavior, and/or (2) deliberately implement dilemmas that bear moral implications.

In the USA, College athletes received a major stimulus when a National Collegiate Athletic Association was created in the early twentieth century. There was a rise in the popularity of sports within colleges and universities, and funding greatly increased. Colleges took great pride in their athletic programs, and sports scholarships became a norm. There was also a surge in people who enrolled in sports education programs to meet the growing demand for professionals in the field (Shulman & Bowen, 2011).

But this is not meant to be implicit that the history of physical education has been all encouraging. There was certainly a decline in the late twentieth century in the commitment to physical education. The growing offering of extra subjects and electives in schools means that the shift focused away from physical education and academics. The country also faced an economic decline around 1970 and 1980. The lack of government funding means that physical education programs were often the first to be cut from schools and universities (Stratheran, 1992).

But for balanced curriculums, recent awareness of the need, particularly given the national concern over the state of obesity and children’s attention towards non-physical activities like video games, has brought physical education back in the spotlight. In early classes, the government has re-signalled its commitment to physical education by making it mandatory in public schools. But it remains an elective at the high school level. In the history of physical education, one of the most interesting developments has been how the definition of physical education has developed. While it only confined to traditional sports in the beginning, it now includes several less physical activities such as yoga and meditation, which are considered critical to helping students develop a sense of control in such a stressful age (Varnava, 2014).

Methodology
The present study was about to evaluate the perceptions of the teachers of Health and Physical Education at post-graduate level in Khyber Pakhtunkhwa; therefore the survey research design was applied for the study.

Population of the Study
190 teacher educators of 05 public sector universities and 19 government colleges of Physical Education constituted the population of the study.

Sample
A sample of 95 teacher educators (30 from the universities and 65 from the colleges) of 05 public sector universities and 10 government colleges of Physical education, which was 50% of the population, were selected randomly for the study.

Instrumentation
For the purpose of data collection, a questionnaire consisted of 44 items was designed for the teacher educators under the supervision of the supervisor. This questionnaire was designed to probe curriculum design, teaching methods, sports infrastructure, students’ evaluation, provision & Use of ICT, students’ guidance & Counseling, development of skills, the strength of the faculty, students and teachers’ interaction, research & project management. The research instrument was prepared in the light of a review of literature and tools used in the previous studies.
Pilot Testing
For pilot testing, the validated research tools were administered to a part of the population that was not included in the sample. The questionnaire for teacher educators was administered to five teacher educators. This tool was further improved in the light of feedback from the respondents under the guidance of experts. The reliability of the research questionnaire was determined by calculating Chronbach alpha. The reliability coefficient for teacher educators was found to be 0.8.

Data Collection
For pilot testing, the validated research tool was administered to a part of the population that was not included in the sample. The questionnaire for teacher educators was administered to five teacher educators. The tool was further improved in the light of feedback from the respondents under the guidance of experts. The reliability of the research questionnaire was determined by calculating Chronbach alpha. The reliability coefficient for teacher educators was found to be 0.8.

Data Analysis
The quantitative data collected through the questionnaire were tabulated and analyzed using the chi-square test.

Findings and Results
Table 1. Teacher educators’ responses regarding the process of the post-graduate program of physical education in Pakistan.

| S. No | Questions /Items/Statements                                                                 | Frequencies of Responses | Mean  |
|-------|-------------------------------------------------------------------------------------------|--------------------------|-------|
| 1     | I am satisfied with the reliability of the current evaluation system.                      | 23 48 12 5 7             | 3.79  |
|       | The Research work is obligatory for degree completion of M.Sc Physical Education in our institution. | 24.2% 50.5% 12.6% 5.3% 7.4 |       |
| 2     | The administration encourages teachers for innovations and research projects.              | 39 30 12 10 4            | 3.95  |
|       | The administration financially supports the teachers so that they may concentrate only on their work. | 41.1% 31.6% 12.6% 10.5% 4.2% |       |
| 3     | We are encouraged to take part in refresher courses to enhance our knowledge and skills regularly. | 28 34 14 13 6          | 3.68  |
|       | Presentations are assigned to the students on modern sports concepts and approaches on a regular basis to sharpen their communication skills. | 29.5% 35.8% 14.7% 13.7% 6.3% |       |
| 4     | The students in our department students are encouraged for study trips and excursion.     | 21 48 13 5 8            | 3.73  |
|       | Our department arranges the teaching practice as an integral part of the post-graduate program of physical education. | 22.1% 50.5% 13.7% 5.3% 8.4% |       |
| 5     | I utilize ICTs for new resources to make my teaching more effective.                     | 31 41 11 8 4            | 3.92  |
|       | In my class, during teaching, I proceed from simple to complex and known to unknown.     | 32.6% 43.2% 11.6% 8.4% 4.2% |       |
| 6     | The students in our department students are encouraged for study trips and excursion.     | 37 37 7 9 5             | 3.97  |
|       | Our department arranges the teaching practice as an integral part of the post-graduate program of physical education. | 38.9% 38.9% 7.4% 9.5% 5.3% |       |
| 7     | I utilize ICTs for new resources to make my teaching more effective.                     | 41 37 10 8 5           | 4.18  |
|       | In my class, during teaching, I proceed from simple to complex and known to unknown.     | 43.2% 38.9% 10.5% 8.4% 5.3% |       |
| 8     | The students in our department students are encouraged for study trips and excursion.     | 41 37 8 5 2            | 4.18  |
|       | Our department arranges the teaching practice as an integral part of the post-graduate program of physical education. | 43.2% 41.1% 8.4% 5.3% 2.1% |       |
| 9     | I utilize ICTs for new resources to make my teaching more effective.                     | 34 48 5 4 4            | 4.09  |
| S. No | Questions / Items/Statements                                                                 | Frequencies of Responses | Mean |
|-------|---------------------------------------------------------------------------------------------|--------------------------|------|
|       |                                                                                             | SA  | A  | UD | DA | SDA |     |
| 11    | I encourage my students to participate actively in the teaching-learning process.           | 45  | 30 | 12 | 3  | 5   | 4.13|
| 12    | Group work and team teaching is encouraged in our department.                               | 36  | 39 | 15 | 2  | 3   | 4.08|
| 13    | There exists a monitoring system to monitor the performance of the individual and the program regularly. | 33  | 40 | 12 | 6  | 4   | 3.97|
| 14    | There is no favouritism in the assessment of the students.                                  | 42  | 35 | 11 | 5  | 2   | 4.16|
| 15    | The majority of the teacher educator (73%) agreed that the research work is obligatory for degree completion of M.Sc Physical Education in their institutions (Table 1). | 37  | 32 | 16 | 8  | 2   | 3.99|
| 16    | Visits and tours to the sports board and gymnasium are frequently arranged for the students in our department. | 26  | 43 | 15 | 6  | 5   | 3.83|
| 17    | Precautions and safety measures are in force in the fields during sports practices in our department. | 23  | 33 | 15 | 5  | 2   | 3.79|
| 18    | Discourage drug abuse, and narcotics are strongly discouraged in our department.           | 40  | 33 | 15 | 5  | 2   | 4.09|

**Findings Related to Teacher Educators’ Responses Regarding the Process of Post-Graduate Program of Physical Education in Pakistan.**

1) The majority of the teacher educator (74%) agreed that they are satisfied with the reliability of the current evaluation system (Table 1).
2) The majority of the teacher educator (73%) agreed that the research work is obligatory for degree completion of M.Sc Physical Education in their institutions (Table 1).
3) The majority of the teacher educator (65%) agreed that the administration encourages teachers for innovations and research projects (Table 1).
4) The majority of the teacher educator (70%) agreed that the administration financially supports the teachers so that they may concentrate only on their work (Table 1).
5) The majority of the teacher educator (60%) agreed that they are encouraged to take part in refresher courses to enhance their knowledge and skills regularly (Table 1).
6) The majority of the teacher educator (76%) agreed that Presentations are assigned to the students on modern sports concepts and approaches on a regular basis to sharpen their communication skills (Table 1).
7) The majority of the teacher educator (78%) agreed that the students in their department encouraged for study trips and excursion (Table 1).
8) The majority of the teacher educator (82%) agreed that their department arranges the teaching practice as an integral part of the post-graduate program of physical education (Table 1).
9) The majority of the teacher educator (84%) agreed that they utilize ICTs for new resources to make their teaching more effective (Table 1).
10) The majority of the teacher educator (86%) agreed that in their class, during teaching, they proceed from simple to complex and known to unknown (Table 1).
11) The majority of the teacher educator (79%) agreed that they encourage their students to participate actively in the teaching-learning process (Table 1).
12) Majority of the teacher educator (79%) agreed that Group work and team teaching is encouraged in their department (Table 1).
13) The majority of the teacher educator (77%) agreed that there exists a monitoring system to monitor the performance of the individual and the program regularly (Table 1).
14) The majority of the teacher educator (81%) agreed that there is no favoritism in the assessment of the students (Table 1).
15) The majority of the teacher educator (73%) agreed that entry into a post-graduate program of physical education in their institution is totally merit-based (Table 1).
16) The majority of the teacher educator (73%) agreed that Visits and tours to the sports board and gymnasium are frequently arranged for the students in their department (Table 1).
17) The majority of the teacher educator (58%) agreed that Precautions and safety measures are forced in the fields during sports practices in their department (Table 1).
18) The majority of the teacher educator (76%) agreed that Discourage drug abuse and narcotics are strongly discouraged in their department (Table 1).

Findings Related to Teacher Educators’ Responses Regarding the Product of the Post-Graduate Program of Physical Education in Pakistan.

Table 2. Teacher Educators’ Responses Regarding the Product of the Post-Graduate Program of Physical Education in Pakistan.

| S. No | Questions / Items/Statements                                                                 | Responses | Mean |
|-------|--------------------------------------------------------------------------------------------|-----------|------|
| 1     | The post-graduate program of physical education at our department has succeeded to produce more confident and responsible graduates. | SA 31   A 32   UD 16  DA 9  SDA 7                      | 3.75    |
| 2     | The post-graduate program of physical education in our institution provides for social adjustment of the students | SA 22   A 49   UD 14  DA 8  SDA 2                      | 3.85    |
| 3     | The post-graduate program of physical education in our institution helps in character building. | SA 44   A 30   UD 15  DA 4  SDA 2                      | 4.16    |
| 4     | The post-graduate program of physical education in our department sports and physical education enhances the quality of leadership. | SA 34   A 37   UD 15  DA 8  SDA 1                      | 4.00    |
| 5     | The existing curriculum of the post-graduate program of physical education in our institution has contributed a lot to the uplift of sports in Pakistan. | SA 44   A 25   UD 15  DA 8  SDA 2                      | 4.07    |
| 6     | The post-graduate program of physical education in our institution may help in maintaining psychological health. | SA 45   A 33   UD 16  DA 1  SDA 1                      | 4.27    |

1) The majority of the teacher educator (65%) agreed that the post-graduate program of physical education at their department has succeeded to produce more confident and responsible graduates (Table 2).
2) The majority of the teacher educator (75%) agreed that the post-graduate program of physical education in their institution helps in character building (Table 2).
3) The majority of the teacher educator (78%) agreed that the post-graduate program of physical education in their institution helps in character building (Table 2).
4) The majority of the teacher educator (74%) agreed that the post-graduate program of physical education in their department sports and physical education enhances the quality of leadership (Table 2).

5) The majority of the teacher educator (73%) agreed that the existing curriculum of the post-graduate program of physical education in their institution had contributed a lot to the uplift of sports in Pakistan (Table 2).

6) The majority of the teacher educator (84%) agreed that the post-graduate program of physical education in their institution might help in maintaining psychological health (Table 2).

Conclusions

Following conclusions were drawn from the analysis of the data findings gathered from the respondents:

It is concluded from the findings that the curriculum of physical education is related to the previous and experiences of the students, and the objectives are clear and achievable. It further reveals that the objectives of Health and Physical Education are clear and precise, and relevant to the national and international demands. The curriculum of the post-graduate level Program is promoting a healthy and simple lifestyle at the campus.

It is also concluded that the post-graduate curriculum of Health and Physical Education fulfils their needs, and they prepare course plans according to the provided curriculum. It is analyzed that students used ICTs effectively for presentation and their teacher uses technology during teaching-learning in the classroom, semester rules are strictly observed at the post-graduate level, and ICTs related facilities are available in the majority of the departments. The teachers encourage students to think creatively and develop critical thinking. Students are engaged in constructive discussions on different ideas and complex concepts. The teachers used different techniques for assessment and evaluation effectively. Frequent field trips and excursions are frequently arranged, and students are encouraged to participate in different events in the departments to retain physical fitness. The teachers of Health and Physical Education are teaching different topics through activity-based learning and adopted active learning strategies for teaching in the classroom. The teachers have entered the classroom with proper planning and preparation to achieve the desired objective. The teachers use lecture-demonstration methods along with questioning and discussion techniques to motivate the students in the classes. The teachers give assignments and different tasks to the students to sharpen their practical skills and also use different simulations for clearing the concepts. It is concluded that seminars and workshops are rarely arranged for the students regarding research report writing and synopsis.

It is also concluded that ICTs facilities are lacking in the majority of the physical education departments to meet students need satisfactorily. Research work is not obligatory for the completion of the M.Sc Health and Physical Education Program in the majority of the institutions. Research work is not encouraged at the master level, and teacher educator is lack research expertise. The program is theoretical in nature rather than activity and research-oriented. It is also concluded that teaching practice is not a mandatory part of their course work at the post-graduate level. The students lack professional skills. It is also concluded that the teachers do not keep students engaged in the learning process by using different methods. Teachers at the post-graduate level in physical education do not use innovative instruction and teaching methodology for teaching at the post-graduate level.

The provision of financial supports from the administration to the faculty is not up to a satisfactory level. The faculty of physical education is not satisfied with the current evaluation system in the institution, and there prevail favoritism and biases in the examination system.

Teachers are not supported for their professional development in terms of training and refresher courses—the physical education program lacks in precautionary and safety measures during the sports practices at the campus.

Recommendations

Keeping in mind the findings and conclusion of the study, let the researcher make the following recommendations for the improvement of the Post Graduate Program of Health and Physical Education.
Health and Physical Education program at the post-graduate level lacks in its evaluation process; traditional methods of evaluation are prevalent in the health and a physical education department that do not work accurately to indicate deficiencies of the program are students learning. Therefore the programs of Health and Physical Education at the post-graduate level needs evaluation of the modern time. The government may establish a modern comprehensive evaluation system for all the departments of Health and Physical Education in the post-graduate colleges and public sector universities under the supervision of HEC.

The present study reveals that the curriculum taught at the post-graduate level has an emphasis on theoretical aspects while practical utility and application is neglected aspects of curriculum and instruction. The curriculum of Health and Physical Education at the post-graduate level may be devised according to the national and international needs, demands and emerging trends.

The study reveals that there is a dire need to strengthen the faculty in the Department of Health and Physical Education and sports sciences in the public sector universities and post-graduate colleges of Pakistan to ensure quality and standard of international level and the faculty may be strengthened through indigenous and foreign PhD Scholarship programs.

To ensure quality and effectiveness in the teaching-learning process, the institutions must organize refresher courses for the teaching staff of Health and Physical Education to promote creativity and productivity.
References

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology, 80*, 260-267.

Bloomfield, A. (2007). Health or art? The case for dance in the curriculum of British State Schools 1909-1919. *History of Education, 36*(6), 681-696.

Bowers, S. T. (2009). Adapted physical education professors' perceptions of teaching behaviors of effective general and adapted physical educators. Texas Woman's University.

Castelli, D., Hillman, C., Buck, S., & Erwin, H. (2007). Physical fitness and academic achievement in third and fifth grade students. *Journal of Sport & Exercise Psychology, 29*, 239-252.

Coe, D. P. (2003). *The importance of physical education classes in relation to physical activity behaviors, physical fitness, and academic achievement in middle school children* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses. (3115952)

Corbin, C. B. (2002). Physical activity for everyone: What every physical educator should know about promoting lifelong physical activity. *Journal of teaching in physical education, 21*(2), 128-144.

Darling-Hammond, L., Berry, B., & Thoreson, A. (2001). Does teacher certification matter? Evaluating the evidence. *Educational evaluation and policy analysis, 23*(1), 57-77.

Ehrlich, G. (2008). Health = performance. *American School Board Journal, 196*(10), 42-44.

Faigenbaum, A., Farrell, A., Radler, T., Zbojovsky, D., Chu, D., Ratamess, N., & Hoffman, J. (2009). Plyo play: A novel program of short bouts of moderate and high intensity exercise improves physical fitness in elementary school children. *Physical Educator, 66*(1), 37-44.

Hillman, C., Castelli, D., & Buck, S. (2005). Physical fitness and neuro cognitive function in healthy preadolescent children. *Medicine & Science in Sports & Exercise, 37*, 1967-1974.

Linn, R. L. (2008). Measurement and assessment in teaching. Pearson Education India.

Maloney, M., & McCormick, R. (1992). An examination of the role that intercollegiate athletic participation plays in academic achievement. *The Journal of Human Resources, 28*(3), 555-570.

National Research Council. (1996). National science education standards. National Academies Press.