



GENDER AND TEACHER-STUDENT INTERACTIONS IN BOTSWANAN JUNIOR SECONDARY SCHOOL PE CLASSES

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Abstract

The aim of this study was to investigate the association between students' gender and teacher-student interactions in a sample of Botswanan junior secondary school Physical Education lessons. Ninety-six lessons taught by male and female physical education teachers were observed, coded, and analysed for gendered interaction patterns. Chi-square test of independence was used for data analysis. The level of statistical significance was set at $p < .05$. Results reveal a statistically significant association between students' gender and teacher-student interactions with respect to task allocation and misbehaviour management. No significant associations were found between students' gender and teachers' questions and feedback. The study concludes that systematic observations of pedagogical interactions in physical education settings are necessary to highlight deeply entrenched gender equity issues in co-educational classrooms. Physical education teacher preparation programmes must impress upon pre- and in-service candidates the importance of and different approaches to enacting gender-sensitive instructional practices. Providing physical education teachers with contextualized pedagogical directions and resources for analysing and addressing gender bias in their classroom will equip them to create inclusive, interactive, respectful, equitable, and productive lessons.

Key words: reference values, quadriceps and hamstring strength, young individuals

Introduction

Gender-sensitive teacher-student interaction is crucial to enacting equitable and inclusive physical education programme [1]. Without this sensitivity, physical education teachers might wittingly or unwittingly display socially constructed gender-biased attitudes, teaching styles, feedback modes, performance expectations, and power relations that are capable of alienating, homogenizing, essentializing, stereotyping, marginalizing, and disempowering their students [2-4]. Exploring the issue of gendered and gendering classroom interactions is particularly important in physical education given that traditional assumptions about the subject are generally associated with stereotypical masculine traits such as competitiveness, toughness, fitness, and aggressiveness [5, 6]. The centrality of gender in classroom interactions has been recognized in other domains of education such as science,

technology, engineering, art, and mathematics (STEAM). For instance, Stannard [7 para. 6] noted that, *Typically, boys simply take up more of a teacher's time, and tend to receive more positive, but also more negative, attention; girls tend to be systematically underrepresented in classroom interactions, and often take on moderating roles, softening the classroom atmosphere. The co-educational classroom agenda tends to be set by the needs of boys.*

Contemporary research has shown that quantitative and qualitative differences in how boys and girls are treated in school subjects associated with hegemonic masculinity reinforce sexist standards and gender stereotypes, affect students' subject preferences, and dampen their vocational aspirations [8-12]. In Botswana, gendered beliefs and practices permeate social and cultural processes such as living arrangements [13], power relations, and

HIV/AIDS [14, 15]. Research in the Botswanan school context suggests that patriarchal assumptions and practices play out in the curriculum, textbook design, subject specialization, academic performance and progression, and assessment [16, 17]. However, there has been little research on the association between students' gender and teacher-student interactions in the Botswana secondary school physical education context, considering that strong evidence of entrenched gender bias with respect to STEAM subjects in the country was found [18]. This means that the issue of gender in Botswanan basic education needs to be examined in a broader context that includes physical education. Physical education is an elective subject taken by a third of students in Botswanan public secondary schools, and PE teachers make daily contextualized decisions about unit design, lesson plans, activity goals, instructional methods and materials, behaviour management, and class interactions to get students engaged and challenged. These decisions are pedagogically consequential, and shedding empirical light on how gender is embedded in them is integral to understanding one of the micro-level factors in the classroom that could impede policy efforts to make physical education equitably attractive to all interested students. This gap is explored in the present study.

Objective

The objective of the study was to establish if there are significant statistical associations between students' gender and the frequencies of physical education teachers' feedback, task allocations, questioning practices, and management of learners' misbehaviours. The main research question was: Are there significant associations between students' gender and teacher-student interactions with respect to the feedback, task allocations, questioning, and behaviour management accorded to boys and girls in Botswanan junior secondary school physical education classes? The null hypotheses were:

Ho1: There is no significant association between students' gender and teacher feedback.

Ho2: There is no significant association between students' gender and class task allocations.

Ho3: There is no significant association between students' gender and teacher questioning.

Ho4: There is no significant association between students' gender and class behaviour management.

Material and Methods

This quantitative study involved the collection of naturalistic observational data on teacher-student interactions in a sample of secondary school physical education lessons [19]. In naturalistic observation research, the researcher must go where the target behaviour normally occurs, using standardized procedures to obtain reliable data [20]. In Botswanan secondary schools, a physical education lesson typically lasts 40 minutes. The study material comprised 192 physical education lessons taught by male and female teachers in six junior secondary schools in Gaborone, Botswana, over eight weeks. Each class was attended by an average of 25 students, making a total of 150 students (90 boys and 60 girls). 96 of the recorded 192 lessons, comprising 64 hours of teaching, were systematically selected for coding and analysis to obtain a representative sample in terms of class level, theory and practical lessons, and location of the schools at the study site.

IRB clearance and permission to conduct the study were obtained from the University of Botswana and the Botswanan Ministry of Basic Education, respectively. Prior to accessing the schools, the regional education office and school heads were informed about the purpose of the study to solicit their support. Once the necessary informed consent and assent were obtained, discussions were held with the physical education teachers to lay the groundwork for data collection. Three camcorders were mounted at specific areas of the classroom to videotape the physical education lessons and capture teacher-student interaction episodes. The recorded lessons were then downloaded into a memory card for coding and analysis.

Measures/Instruments

An event coding system was drawn from systematic observation instruments used in [21]. The categories in the adapted coding system included:

- feedback - any task-related or comments provided by the teacher during and after a performance to improve learning.
- task allocation - any responsibilities assigned to individual students within the lesson context, for example, leading warm up, collection and distribution of equipment, setting up equipment, group leadership, and peer instruction.
- questioning Practices - the nature of questions asked (recall, comprehension, analytical, synthesis or evaluative), amount/frequency, and probing (rephrasing questions for clarity).
- misbehaviour management - how the teacher handled behaviours that were disruptive to the class such as noise making, noncompliance, fighting, bullying, inattentiveness, off-task behaviour.

Prior to coding, a three-day coder training was held to establish a common understanding of the variables. To establish inter-observer

reliability, a sample of video clips (18 lessons) were randomly selected for coder training and pilot testing to prevent differential coding due to misinterpretation of teacher behaviour. Five coders watched the same videos and independently coded the gendered teacher behaviour, using an event recording sheet. The tallies were then compared for consistency. Krippendorff's alpha inter-rater reliability coefficient of .741 was obtained.

Statistical analysis

The categorical variables obtained from the coded data were cross tabulated for Chi-Square tests of independence, using the IBM SPSS 26. Following [22], statistically significant associations between variables were interpreted by comparing the cell counts and the contribution of each cell to the Chi-square value.

Results

Feedback is an important formative tool for fostering student engagement, motivation and learning improvement. A Chi-Square Test of Independence was performed to assess the relationship between the frequencies of physical education teachers' feedback and students' gender.

Table 1. Gender - Feedback

Feedback	Gender		Total
	Boys	Girls	
Positive (General)	371	247	618
Negative (General)	521	362	883
Positive (Specific)	497	314	811
Negative (Specific)	382	223	605
Corrective	451	335	786
Nonverbal (Positive)	225	148	373
Nonverbal (Negative)	24	12	36
Total	2471	1641	4112

$p > .05$

Table 1 presents the distribution of feedback by students' gender. Since the p-value is larger than the chosen alpha level of 0.05, the null hypothesis was retained, implying that the

relationship between students' gender and physical education teachers' feedback in the research data was not significant ($\chi^2 = 6.3$, $df = 6$, $P = 0.387$).

Table 2. Gender - Task Allocation

Task Allocation	Gender		Total
	Boys	Girls	
Leading Class Warm-Up	48	2	50
Leading Cool-Down	47	13	60
Getting Equipment	47	32	79
Distributing Equipment	26	29	55
Arranging Equipment	18	15	33
Leading Group	178	66	244
Officiating	63	5	68
Peer Teaching	194	58	252
Writing on the Board	59	53	112
Collecting Books	19	37	56
Reading	20	33	53
Total	660	290	950

$p < .001$

The chi-square test of independence examined the relationship between gender and task allocation in the sampled physical education settings. The test result in Table 2 shows that the relationship was significant at less than the stipulated alpha level ($\chi^2 = 131.9$, $df = 10$, $p < .001$). Consequently, the null hypothesis was rejected. Cramer’s V, a measure of effect size or magnitude of association, was .35, indicating a strong relationship between students’ gender and task allocation by their physical education teachers. Class responsibilities were predominantly assigned to one gender. For instance, boys were more likely than girls to lead class activities, instruct and officiate; while

girls were more likely than boys to collect books and be asked to read to the class.

Effective questioning is crucial to guiding physical education learners’ observation skills execution, class discussion, performance evaluation, critical thinking and attainment of instructional goals and learning outcomes. Thus, gendered questioning practices constitute a “hidden curriculum” that can reinforce stereotypes, differential performance expectations and achievement in the classroom. Accordingly, a Chi-Square Test of Independence was performed to assess the relationship between students’ gender and the type of questions asked by the physical education teachers.

Table 3. Gender - Questioning Practices

Questions	Gender		Total
	Boys	Girls	
Recall	255	174	429
Comprehension	219	148	367
Analytical	57	28	85
Evaluative	37	33	70
Follow-up	163	105	268
Rephrasing	111	91	202
Total	842	579	1421

$p > .05$

Results of the Chi-square analysis in Table 3 were not significant at the chosen alpha level of 0.05. In other words, there was no evidence of statistically significant relationship between students’ gender and physical education

teachers’ questions ($\chi^2 = 5.2$, $df = 5$, $P = 0.394$). These results suggest that distributions of questioning were similar for boys and girls. Differential ways in which physical education teachers manage productive or disruptive

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interactions in the classrooms can reproduce and reinforce gender norms regarding acceptable behaviours for boys and girls. A Chi-Square Test of Independence was performed to assess the relationship between students'

gender and how their misbehaviours were handled by the physical education teachers. The Chi-square results in Table 4 indicate a statistically significant association ($\chi^2 = 9.04$, $df = 2$, $p < .001$) with a Cramer's V of .07.

Table 4. Gender - Misbehaviour Management

Misbehaviour Management	Gender		Total
	Boys	Girls	
Warning	339	144	483
Reprimand	377	166	543
Ignore	398	237	635
Total	1136	525	1661

$p < .001$

In the observed videos, boys were more likely than girls to receive warnings and reprimands. They were also more likely to have some of their misbehaviours ignored by the teachers.

Discussion

The study results indicate disproportionate teacher feedback between boys and girls in the observed PE lessons. Although not statistically significant, the boys received about 40% of all categories of teacher feedback. Not only were the girls less likely to receive negative feedback; they were also less likely than the boys to receive positive and corrective ones as well. This finding corroborates the gender differentiated feedback and interaction patterns that were observed by Nicaise et al. [23]. Recent empirical studies suggest that teacher feedback disparity has implications for students' physical education identity, engagement and self-efficacy, and that meaningful academic experiences can be enhanced by teacher support and high expectations [24, 25].

The results in Table 2 suggest that in the observed lessons girls were less engaged and less privileged in terms of leadership experiences due to gendered interactions and task allocations. Boys tended to assume more socially defined stereotypical male roles such as leading, instructing, officiating, and hauling equipment, while girls tended to assume more reading and item collection roles.

Task allocations and performative experiences in physical education classes provide a context for students' personal and

professional development. Physical education teachers need to challenge the traditional sexist notion of physical activity pedagogy that constrains girls from performing strong, expressive, assertive, and empowering roles due to gender stereotypes [26]. This challenge is particularly important given recent research in Self-Determination Theory and Achievement Goal Theory indicating that helping students assume more responsibilities in task-oriented physical education and sport settings enhances perceived competence, needs satisfaction, autonomy, and intrinsic motivation [3, 27, 28].

Questioning practices have implications for students' understanding and cognitive processes. Accordingly, physical education teachers' questioning practices were included in this observational analysis to determine whether the application of Bloom's taxonomy in the classroom is independent of gender. Though results of the chi-square analysis were not statistically significant, there are apparent gender differences in teacher questions directed to boys and girls. Boys tended to receive about 60% of follow-up, analytical, recall, comprehension, and rephrased questions relative to girls. This calls for physical education teachers' social cognitive interventions to reduce gendered questioning practices in the classroom in favour of Socratic and constructivist approaches [29-31].

Physical education teachers need to create instructional environments that enhance conceptual understanding of lesson topics for all students by asking questions across Bloom's cognitive dimensions or levels of thinking,

remembering, understanding, applying, analyzing, evaluating, and creating [32-34].

The statistical analysis revealed a significant association between students' gender and patterns of teachers' responses to misbehaviours in the observed physical education lessons. As noted by previous researchers, boys in the observed lessons were more likely than girls to engage in disruptive behaviours in secondary school physical education classes [35, 36]. Teachers in the present study tended to issue more warnings and reprimands to boys relative to girls to stop perceived disruption to learning and teaching. They also tended to ignore more distractions from boys compared to girls. It was observed that the teachers were more punitive towards boys through aversive disciplinary strategies coded as warnings and reprimands (e.g., scolding, embarrassment, threats, and blame) to regulate behaviours, and to use more positive reinforcements such as praise and encouragement to elicit compliance among girls. This finding has important implications for improved application of physical education teachers' social-psychological skills to understand boys' and girls' behaviours, and to use preventive class management and pedagogical styles that promote social healthy identity development, responsibility, self-control, and engagement [37-41].

Conclusions

Gender issues in school physical education are complex and related to a host of ecological factors, including teacher-student interactions. This exploratory observational study in the Botswanan context tested four null hypotheses on the association between students' gender and frequency of physical education teachers' feedback, task allocation, questioning, and behaviour management for statistical significance. Statistically significant associations were found between student gender and teacher questioning and task allocations. Overall, girls in the videotaped lessons did not get equitable opportunities for peer leading, instructing, officiating, and

setting up of physical activity equipment. They received disproportionately fewer teacher feedback and questioning. Moreover, they were less likely than boys to receive warnings and reprimands for disruptive behaviours while boys were more likely to be targets of punitive and aversive disciplinary strategies.

Limitations of this study include its correlational, non-parametric analysis, the selection of only four classroom variables for exploration, and the inclusion of physical education lessons taught in only five out of all public junior secondary schools in Gaborone, the capital city of Botswana. Suggestions for future research include a replication of the study with larger samples of junior and senior secondary school physical education classes, using mixed methods to gain deeper insight into gendered interactions and their associations with male and female students' physical education academic outcomes, self-concept, self-efficacy, physical activity behaviour, and persistent commitment to the subject as a career pathway. Further understanding can also be gained from studying gender dynamics in physical education classes taught by novice and experienced physical education teachers.

The findings of the study suggest that physical education teachers need to reflect on their subconscious gender bias and sexist stereotypes when distributing questions, using peer instruction, assigning leadership and organizational roles, providing feedback, and selecting behaviour management strategies in view of recent research results highlighting the influences of students' and teachers' gender and students' and teachers' gender-stereotyped beliefs about students' attitudes and student-teacher relationship in middle and high school physical education [42, 43]. Moreover, physical education teacher education programmes need to expose pre- and in-service candidates to multidisciplinary frameworks that illuminate the gendered and gendering pedagogical practices and the evidence-based approaches to creating inclusive and gender-equitable learning environments.

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