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Determinants of Competence and Self-Regulation among Secondary Physical Education Students in Ghana

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Abstract

The satisfaction of the needs for both competence and self-regulation influence student motivation. Guided by Self-Determination Theory (SDT), this study examined the influence of gender, grade level, program type, and school sport participation (SSP) on perceived competence and self-regulation among secondary physical education students. Participants included 158 students (109 males and 49 females) aged 14 to 24 years old (M = 18.91; SD = 1.48) enrolled in compulsory second and third year (Grades 11-12) PE at one high school in Ghana. The students completed the Perceived Competence Scale (PCS) and the Self-Regulation Questionnaire-Learning (SRQ-L). The PCS and SRQ-L were reworded to pertain to the PE context. The SRQ-L had two subscales: autonomy regulation (AUT) and controlled regulation (CTR). The percentage of students with high levels of PCS, AUT, and CTR were 46.20%, 49.37%, and 18.99% respectively. PCS had a significant positive correlation with AUT, CTR, and grade level. In addition, PCS, AUT, and CTR all had significant positive correlations with grade level. The mean differences for PCS, AUT, and CTR differed by grade level and program type, but not gender or SSP. Differences in grade level and program type should be considered in helping students enhance their perceived competence and self-determination in PE.

Keywords: Autonomy, competence, physical education, high school, Ghana

1. Introduction

Satisfaction of the needs for competence, autonomy, and relatedness influence student motivation (Deci & Ryan, 2000). The innate demand for these three psychological needs serve as key tenets of human motivation (Deci & Ryan, 1985). People, according to Self Determination Theory (SDT), thrive and feel well when the environment enables them to satisfy these three basic needs (Ryan & Deci 2000ab). Competence is about feeling effective and confident in pursuing an activity (Ryan & Deci, 2002), autonomy is the need to feel ownership of one's behavior, and relatedness is about being accepted by others and feeling connected to others in a secure environment (Ryan & Deci, 2002). Self-regulation motivation is important for achievement in physical education, as abilities and skills alone are not sufficient for achievement (Schunk, 2005). The nature of teacher's classroom dialogue influences students' self-determined motivation (Black & Deci, 2000). The more teachers support autonomy in their relationships with students, the more they promote their autonomous motivation—that is allowing students to have choices and act with a sense of volition (Deci & Ryan, 2012). Alternatively, controlled regulation promotes

controlled motivation and amotivation by hindering students' need for autonomy (Reeve, 2009). Controlled regulation involves people engaging in behaviors either to get rewards and avoid punishments or to feel social approval and to avoid feeling guilty or worthlessness. Inappropriate self-regulation strategies can negatively impact students' problem solving performance, and their approach to learning (Suthar & Khooharo, 2013).

Perceived competence and autonomous motivation have been found to predict a range of behavior change and learning outcomes (Williams & Deci, 1996; Williams, Saizow, Ross, & Deci, 1997). Lau and Roeser (2002), for example, reported that perceived competence significantly predicted engagement and achievement among high school science students. It is therefore paramount that teachers create conducive environments for students to acquire the requisite knowledge and skills that would make them effective and confident in learning the subject matter.

Autonomous motivation is when people have identified with and internalized the value of activities they are engaged in (Deci & Ryan, 2008). It results in several positive outcomes such as persistence and effective performance (Deci & Ryan, 2008). Providing students with options about what to do or how to do things allow volition and enhance intrinsic motivation (Bao & Lam, 2008). Thus, teachers need to provide opportunities for students to select or set goals and the ways to achieve them. Teacher classroom interactions can provide autonomy support through dialogue in three key ways: focused dialogue, choice focused dialogue and criticism supporting dialogue (Assor, Kaplan, & Roth, 2002; Ryan and Deci 2000a). Relevance focused dialogue is the extent to which the teacher talks to students about why it is important to learn the subject matter. A physical education teacher, for example, could stress the importance of warm up and cool down during a physical fitness unit. Choice focused dialogue is the extent to which the teacher allows choice as part of the learning process. The use of the task (station) teaching approach, for instance, has the potential to provide opportunities for students to work at their own pace, as they would have the choice of activities (Graham, Holt/Hale, & Parker, 2013). Criticism supporting dialogue is the extent to which the teacher enables free and open expression of critical thoughts and independent opinions **(**Assor, Kaplan, & Roth, 2002; Ryan and Deci 2000a). That is, the teacher should create a non-threatening environment that would allow students to openly share their perspectives with the teacher and peers without any repercussions. Research shows that students who perceive that they received support from their teachers would more likely report more motivation to learn and be engaged than those who perceive no support (Yildirim, 2012).

1.1 Perceived competence and autonomy in physical education

Regular participation in physical activity is an important goal of physical education (SHAPE America & Human Kinetics, 2014). Meeting students' needs for competence and self-regulation in PE can help students internalize motivation (Ryan, Williams, Patrick, & Deci, 2009). Research shows that students with high satisfaction of competence and autonomy in PE are more likely to engage in optional PE classes during the subsequent school year (Ntoumanis, 2005). Furthermore, one of the main purposes of physical education is to promote students' understanding of the importance of effort in achieving their goals and the experience of joy in physical activities (Ulstad, Halvari, Sørebø, & Deci, 2016).

Carroll and Loumidis (2001) reported that children of high perceived competence participated in significantly more physical activity outside school than those of low perceived competence. In addition, those with a high perception of their competence in physical education spent more time participating in

team sports traditionally taught in physical education than those with lower perceived competence.

There is evidence to show that autonomous motivation predicts high levels of interest (Goudas, Biddle, & Fox, 1994), effort and students' intentions to be physically active during leisure-time (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003; Standage, Duda, & Ntoumanis,., 2003). Further, students' autonomous motivation has been shown to positively predict teachers' ratings of students' effort and persistence in PE (Standage, Duda, & Ntoumanis, 2005). These are key findings, as an important goal of PE is for children to live physically active lifestyles ((SHAPE America & Human Kinetics, 2014).

Finally, Ntoumanis (2005) found that students who enrolled in optional PE classes reported higher autonomous motivation and lower amotivation than those who chose not to participate. Conversely, controlled motivation and amotivation have been associated with students' boredom and unhappiness (Standage et al., 2005).

Since the introduction of learner-centered pedagogy in many sub-Saharan African countries two decades ago (Tabulawa, 2013), teaching in Ghana (like other sub-Saharan African countries) remains didactic and authoritarian (Acheampong, Pryor, & Ampiah, 2006). Little is known about the extent to which Ghanaian senior high school students perceive their physical competence and self-regulation. There is lack of prior research on the level and determinants of self-determination among Ghanaian secondary students in physical education classes. Therefore, the purpose of the present study was to draw on SDT (Deci & Ryan, 2000) to examine the influence of gender, grade level, program type, and school sport participation (SSP) on perceived competence and self-regulation among secondary physical education students in Ghana. There is the need for an understanding of the factors that impact engagement and achievement in PE in Ghanaian senior high schools.

2. Method

2.1 Participants

Participants for the study included a purposive sample of 158 (109 males and 49 females) students enrolled in one senior high school physical education program in the Northern Region of Ghana. The students, aged 14 to 24 years old (M = 18.91; SD = 1.48), were pursuing five different academic programs: General Arts, Technical/Vocational, Business, General Science, and Agricultural Science. Ninety-three of the participants were in their second year (11^{th} grade) of high school and 63 in the third year (12^{th} grade).

2.2 Instruments

The Perceived Competence Scale (PCS; Williams, & Deci, 1996) and the Self-Regulation Questionnaire-Learning (SRQ-L; Black & Deci, 2000) served as the data sources. The items for both questionnaires were adapted to for the PE context in Ghana. The PCS is a 4-item questionnaire that examined the students' perceived competence in PE classes (both theory and practicals). A sample item is, "I feel confident in my ability to learn the course materials in physical education." Participants responded to each item on a 7-point Likert scale of 1 (not at all true) to 7 (very true). A participant's score on the PCS is the mean of the responses on the four items.

The SRQ-L is a 12-item questionnaire consisting of two subscales: the autonomy regulation and the controlled regulation subscales. The questionnaire asks three questions about why people engage in learning-related behaviors. It measures the reasons why people learn in specific contexts (Black & Deci,

2000). In the present study, the scale examined the reasons why senior high school students participated in their school's physical education program. The three groups of items on the SRQ-L were: "I will participate actively in the physical education program," "I am likely to follow my teacher's suggestions for studying in the physical education program," and "The reason that I will work to expand my knowledge in physical education is." Each group of items consisted of response items representing both the autonomy regulation and controlled regulation. The autonomy and controlled regulation subscales each consisted of seven response items. The questionnaire used a 7-point Likert scale of 1 (not at all true) to 7 (very true). A participant's score on each subscale was determined by calculating the mean of the responses on the seven response items.

2.3 Data Analysis

Data were analyzed using descriptive and inferential statistics. Frequencies and percentages of students with high, moderate, and low levels of competence and self-regulation were calculated. Following previous studies (Nabie, 2016; Sofo & Kanton, 2013). The current study used the following cut-off points to determine the levels of competence and self-regulation for both questionnaires (on 7-point scale): 1-3.49 (low), 3.50-5.49 (moderate), and 5.50-7.00 (high). A correlation matrix for perceived competence, self-regulation, grade level, and age was constructed using Pearson correlation coefficient. To determine gender and grade level differences, the authors run Independent t-Test analyses for perceived competence and self-regulation. Finally, One-Way Analysis of Variance tests, with Bonferroni multiple comparisons, were conducted to determine the influence of program type on students' competence and self-regulation.

The first author's institution granted formal approval for the study. The headmaster of the high school granted the authors permission to conduct the study, after which they received parental consent prior to data collection.

3. Results

3.1 Students' levels of perceived competence and autonomy

Table 1 shows data on students' levels of PCS and self-regulation. The data indicated that the highest percentage of students perceived themselves to have autonomous regulation (49.37%), followed by PCS (46.20%). That is, a little over 50% of students in the present study perceived themselves not to be highly competent to engage in their PE classes. In addition, they felt their PE teachers did not provide autonomy support in their classes. Only 18.99% of participants perceived their PE classes to support controlled regulation.

Table 1. Students' levels of PCS and regulation

Category	High		Moderate		Low	
	f	%	f	%	f	%
Perceived Competence	73	46.20	58	36.71	27	17.09
Autonomous Regulation	78	49.37	67	42.41	13	8.22
Controlled Regulation	30	18.99	101	63.92	27	17.09

3.2 Correlation among PCS, self-regulation, grade level, and age

Table 2 presents data on the correlation among PCS, AUT, CTR, grade level, and age. PCS had a significant positive correlation with AUT (r = .48), CTR (r = .34), and grade level (r = .45). In addition, PCS, AUT,

and CTR all had significant positive correlations with grade level. Conversely, none of the variables was significantly correlated with age.

Table 2. Correlation matrix for perceived competence, self-regulation, grade level, and age

Category	2	3	4	5
Perceived competence (1)	.48**	.34**	.45**	-.02
Autonomy regulation (2)		.46**	.25**	.16
Controlled regulation (3)			.24**	.02
Grade Level (4)				.05
Age (5)				

**p < .01

3.3 Perceived competence, self-regulation, and gender

Table 3 presents data on perceived competence, self-regulation, and gender. The PCS, AUT, and CTR mean scores for females were 5.23, 5.41, and 4.57. These mean scores were higher than the respective mean scores for males. However, the Independent t-Test analyses indicated that the mean scores for males and females on all the three measures did not differ significantly.

Table 3. Independent t-Test for perceived competence, self-regulation, and gender

Category	Males		Females		t-Value	
	M	SD	M	SD	t	P
Perceived Competence	5.00	1.41	5.23	1.35	-.99	.320
Autonomous Regulation	5.21	1.26	5.41	1.08	-.96	.339
Controlled Regulation	4.58	1.09	4.57	1.07	.056	.955

3.4 Perceived competence, self-regulation, and grade level

Table 4 shows data on PCS, autonomy, and grade level. The results indicated that third year students had higher mean scores than second year students on PCS and autonomous regulation. Conversely, second year students had a higher mean score on controlled regulation than third years. The Independent t-Test analyses indicated that the mean differences on all three measures were significant.

Table 4. Independent t-Test for PCS, autonomy, and grade level

Category	2nd Year (n= 93)		3rd Year (n= 65)		t-Value	
	M	SD	M	SD	t	p
Perceived Competence	4.55	1.26	5.82	1.24	-6.28	.000**
Autonomous Regulation	5.01	1.25	5.64	1.04	-3.28	.001**
Controlled Regulation	4.89	.98	4.37	1.11	3.02	.003**

**p < .01

3.5 Perceived competence, self-regulation, and sport participation

Table 5 presents data on PCS, self-regulation, and sport participation. Students who participated in school sports had a higher mean score on the PCS than those who did not. Alternatively, those who did not participate in sports had higher mean scores than those who did on autonomous regulation and controlled regulation. However, the mean differences on all three measures were not statistically significant. That is, students who participated in school sports and those who did not had similar scores on PCS, AUT, and CTR.

Table 5. Independent t-Test for perceived competence, self-regulation, and sport participation

Category	Participated in sport (n= 34)		No sport participation (n= 123)		t-Value	
	M	SD	M	SD	t	P
Perceived Competence	5.33	1.31	4.99	1.41	1.25	.214
Autonomous Regulation	5.27	1.20	5.33	1.23	-.25	.800
Controlled Regulation	4.57	1.12	4.63	.98	-.27	.792

3.6 Perceived competence, self-regulation, and program type

Table 6 shows data on PCS and program type. Students pursuing the Technical/Vocational (6.44) program had the highest mean score on PCS, followed by those in the General Science program (5.75). In contrast, those in the Agricultural Science (4.66) program had the lowest mean score. However, the One-Way ANOVA analysis indicated that the mean scores for all five programs did not differ

Table 6. One-Way ANOVA for perceived competence and program type

Program	N	M	SD	F	p
General Arts	59	5.07	1.26	2.10	.083
Technical/Vocational	4	6.44	.72		
Business	59	5.08	1.40		
General Science	8	5.75	1.27		
Agricultural Science	28	4.66	1.61		

Table 7 shows data on autonomous regulation and program type. Students in the Technical/Vocational (6.70) program had the highest mean score on autonomous regulation followed by those in General Science (5.88) program. Students pursuing Business (5.12) had the lowest mean score. However, the One-Way ANOA analysis did not indicate significant mean differences among the programs.

Table 7. One-Way ANOVA for autonomous regulation and program type

Program	N	M	SD	F	p
General Arts	59	5.29	1.19	2.25	.066
Technical/Vocational	4	6.70	.60		
Business	59	5.12	1.30		
General Science	8	5.88	.75		
Agricultural Science	28	5.18	1.08		

Table 8 shows data on the controlled regulation and program type. The Technical/Vocational program (6.11) had the highest mean score followed by Business (4.70). General Science had the lowest mean score of 4.00. The One-Way ANOVA indicated a significant difference. A Bonferroni multiple-comparison showed the mean score for Technical/Vocational significantly differed from those of General Arts, General Science, and Agricultural Science, but not Business.

Table 8. One-Way ANOVA for controlled regulation and program type

Program	N	M	SD	F	p
General Arts	59	4.55[a]	1.20	3.29	.013*
Technical/Vocational	4	6.11[b]	1.11		
Business	59	4.70	1.01		

General Science	8	4.00[a]	.51		
Agricultural Science	28	4.34[a]	.88		

*p < .05; Mean differences between a and b were significant

4. Discussion and Conclusions

The present study examined the influence of gender, grade level, program type, and school sport participation (SSP) on perceived competence and self-regulation among secondary physical education students in Ghana. A major finding of the study was that less than 50% of students in the study perceived themselves to have high levels of competence or autonomy in their physical education classes. This is in contrast to previous studies that indicated most teacher trainees (Sofo & Kanton, 2013) and mathematics teacher candidates (Nabie, 2016) in Ghana reported high levels of competence and autonomy. The marginalization of the subject (Ammah & Kwaw, 2005; Hardman, 2008) and the emphasis on sport competitions (Ministry of Education [MOE], 2010) may explain why less than half the students in the current study perceived themselves to have high levels of competence in PE. Many high schools in Ghana do not teach PE on a regular basis. Regrettably, the MOE (2010) acknowledged that "Many teachers were not aware of the existence of a Physical Education syllabus for Senior High School" (p. ii). The implication is that teachers would not teach the subject as required by policy (Hardman, 2008) or teach without regard to developmentally and instructionally appropriate educational outcomes. The didactic and authoritarian (Acheampong et al., 2006) nature of classrooms in Ghana may also explain why less than half of the participants in the present study reported experiencing high levels of autonomy. To promote autonomous regulation and make students independent learners, physical education teachers should explicitly teach self-regulation strategies (Rovegno, Chen, & Todorovich, 2003).

A second finding of the present study was that age did not correlate with PCS, AUT, CTR or grade level. The gross enrollment rate (GER) and the net enrollment rate (NER) for senior high schools in the country for the 2014/2015 were 45.6% and 22.5% respectively (MOE, 2015). The gap between GER and NER indicates that approximately half of the students in senior high schools for that year were not of the appropriate age. The GER includes children of all ages, while the NER includes only children of the official school age (MOE, 2015). Often, many Ghanaian senior high schoolers are older than the official age for their grade. The official age range for the three-year senior high school in Ghana is 15-17, whereas the ages for students in the present study ranged from 14-24 years.

A third finding was that grade level had a positive correlation with perceived competence and self-regulation. In addition, third year students had significantly higher means for PCS and AUT than the second years. In contrast, second year students felt their PE classes were more controlled than third year classes. This finding is consistent with that of Nabie (2016) in that the year in training influenced mathematics teacher candidate's competence and autonomy. However, in Nabie's (2016) study, teacher candidates in the first year reported higher levels of competence and autonomy than their counterparts in the second year. Based on the current study, it is expected that students perceive themselves to improve in competence and autonomous regulation in PE from second to the third year.

Fourth, gender and SSP did not influence students' competence or self-determination in PE. The authors were surprised that the competence and self-regulation of students who participated in school sport and those who did not participate were similar. The authors expected those who participated in school sport to report higher levels of PCS and AUT, in view of the notion that PE programs in Ghana are sport-oriented (MOE, 2010a), and that those who participate in school sports would have more opportunities to engage in competitive sports.

Finally, students in the Technical/Vocational program perceived themselves to have the most controlled regulated PE classes. Alternatively, their counterparts in the General Science program reported the least controlled regulation PE environment; perhaps due to the reforms in the science and mathematics curricula that focus on student-centeredness and experimentation (MOE, 2010bc).

The findings have implications for teaching physical education in Ghana. Teachers should provide opportunities for students to satisfy their basic psychological needs of competence and autonomy (Ntoumanis & Standage, 2009). This can be achieved in PE contexts by teaching self-regulation. Rovegno and Bandhauer (2013) suggested that PE teachers teach children to think about the technique while practicing, also to teach about the importance of self-regulation so that students become independent learners. Furthermore, they recommended that teachers teach students to have positive self-talk during learning.

In conclusion, approximately less than half of the participants in the current study reported high levels of perceived competence and autonomous regulation in their Ghanaian senior high school PE classes. In addition, grade level and program type influenced students' competence and self-regulation in PE, while gender and sport participation did not. The present study did not investigate students' perceived competence, autonomy, and their teachers' ability to provide autonomy-supportive environments simultaneously. It would be worthwhile for future researchers to examine these variables in one study. Future researchers would do well to investigate, using qualitative methodologies, as to why students vary in their levels of competence and self-regulation in PE classes. Finally, increasing the research sites to include multiple geographic regions of Ghana would provide insight into the competence and self-regulation of senior high school students in PE classes.

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