

Physical education content alignment with physical literacy outcomes into early adulthood

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ABSTRACT

Purpose: Little is known about if and how the content taught in physical education (PE) influences physical literacy. This study examined alignment between the content young adults experienced in PE and that which they wished they had experienced (i.e., interest alignment), and that they think is important for health and wellbeing as adults (i.e., importance alignment). Further, we investigated the degree to which perceptions of content alignment predict indicators of physical literacy in adulthood including moderate-to-vigorous physical activity (MVPA), positive and negative PA attitudes, and physical self-concept. **Methods:** College students ($N= 370$) completed an electronic survey concerning PE content alignment, MVPA, PA attitudes, and physical self-concept. **Results:** Team sports and fitness activities were content experienced most often while personal and social responsibility activities, outdoor education, and fitness was content identified as most interesting and important. Interest alignment positively associated with MVPA ($\beta= .119, p= .03$) and negatively with negative attitudes toward physical activity ($\beta= -.154, p < .01$). Interest alignment ($\beta= .121, p= .02$) and importance alignment ($\beta= .132, p= .01$) were positively associated with physical self-concept. **Conclusion:** The content offered in PE appears to influence components of physical literacy in adulthood. As such, schools should consider revising curricula to include activities that create the foundation of an active lifestyle in adulthood.

Keywords: curriculum; interest; importance; MVPA; attitudes; physical self-concept

1. INTRODUCTION

School-based physical education (PE) aims to develop physical literacy, which is “the ability to move with competence and confidence in a wide variety of physical activities in multiple environments that benefit the health development of the whole person” (Mandigo et al., 2012, p. 28). However, speculation remains about the extent to which PE is meeting its principal objective (Hastie, 2017). Research indicates that engagement in physical activity (PA), attitudes towards PA, and overall cardiovascular health steadily decline from middle school into adulthood (Mercier et al., 2017; Tremblay et al., 2016). While many researchers speculate about the interpretation of physical literacy in PE and its translation to lifelong behaviors (Liu & Chen, 2021; Lounsbury & McKenzie, 2015), much of the research targets skill competencies, fitness, and PA time (Hastie, 2017; Yli-Piipari et al., 2021a, 2021b) with little respect to the content being offered. This may be problematic given that student interest, value, and feelings toward content areas likely have a large impact on their motivation and future PA choices (Simonton & Garn, 2019).

Toward this end, the current study examined how retrospective perceptions of secondary PE content relates to self-reported physical literacy during adulthood. Specifically, we investigated the alignment between the content young adults recalled being taught in PE settings and that which they assigned value in adulthood. Further, this study investigated the relationship between perceived content alignment and indicators of physical literacy outcomes, including moderate-to-vigorous physical activity (MVPA), attitudes toward PA, and physical self-concept (PSC).

1.1 Content, Interest, and Importance Alignment

Physical education can have a lasting effect on students’ physical and psychological wellbeing. Thus, curriculum choices in PE can facilitate student learning and emotions connected to PA content. For example, Cardinal et al. (2013) reported that negative PE experiences can undermine future PA participation. Adults in that study reported feeling turned off by PE primarily due to experiencing hyper-competitive team activities and uncomfortable social comparisons during games. Ladwig et al. (2018) also found similar results. Participants remembered feeling embarrassed, finding little interest and enjoyment in what was taught, being bullied by peers or by the teacher, and having body anxiety in PE. Nearly half of participants reported feeling no enjoyment in PE with some even reporting that the opportunity to not participate in PE was a more positive experience. Positive or negative experiences in PE appear to be closely connected to individuals’ perceptions of the content and how it is being taught.

Although SHAPE America (2014) and many state education agencies offer suggested/mandated curricular benchmarks, research reports that current PE programs are not utilizing the assortment of best practices and still choose traditional team-based activities, fitness testing, rely on teacher-centered instruction, and fail to assess student learning (Banville et al., 2021; Hodges et al., 2018). For these reasons, it is easy to see how ineffective instruction and outdated approaches to the curriculum in PE can cause negative student experiences. This research also suggests that the psychological/emotional connection with PE content (i.e., perceived interest and importance) is highly connected with learning and future PA choices (Banville et al., 2021; Simonton & Garn, 2019). The national and local standards and benchmarks identify critical learning goals in each of the three learning domains (psychomotor, cognitive, and affective), however achieving these goals and prioritizing these goals can be taught in an assortment of PE content. Yet, the traditional content areas persist as previously reported and students continue to report little to no interest in many topics. Thus, content used to meet standards and benchmarks still seems to be misaligned. These findings suggest that the alignment between what is taught in PE and what students find interesting and important may influence their development of physical literacy. Creating content alignment means students are taught skills, competencies, and behaviors they find meaningful and enjoyable whereas misalignment promotes negative experiences stemming from a lack of meaning and interest.

To this point, Banville et al. (2021) found that students reported activities in PE as mostly team sports (basketball, soccer, and football) and individual sports (swimming, badminton, cycling, dance). However, when participants were asked how often they engaged in these team and individual sports in their leisure, approximately 60% of participants reported they did not choose these activities outside of school. Ultimately, content selection and perceived importance of the content appears to influence student experiences and connections with PE which can have significant negative impact on their PA choices. As summarized by Banville et al. (2021), the curriculum offered by the PE teacher impacts student interest and willingness to participate and provides meaningful learning goals for knowledge and skills needed to be active long term. Therefore, it is important to understand how content choices relate to one's psychological and emotional experience to truly understand the 'down the stream' impact on PA behaviors and beliefs into adulthood. This connection likely represents a key aspect of both the development of physical literacy and the translation of physical literacy into lifelong activity choices. However, limited empirical evidence has explored the relationship between students' perceived importance and interest in PE content and their physical literacy. Based on

assumptions in previous work, it is likely that the skills and competencies currently prioritized in many PE programs are being compromised by the lack of interest and meaning students are finding in the content they are taught, which may create barriers for physical literacy.

1.2 Physical Literacy Indicators

This study has identified three indicators of physical literacy development and key representations that shape PA behaviors and beliefs into adulthood, including MPVA, PA attitudes, and physical self-concept. These pillars may represent both key positive outcomes of one who has gained sufficient physical literacy into adulthood as well as potential perceptions of low physical literacy through reduced or lower reports of the following behaviors and beliefs.

1.3 MVPA

The United States (US) Report Card (2018) indicated that approximately 25% of youth participate in the recommended 60 minutes of MVPA each day, and that activity time drops significantly with age. Collectively, the results earned a grade of D- in US public schools. Similarly, in adulthood, approximately 50% of individuals meet the guideline of 150 weekly minutes of MVPA, and just over 23% of this same demographic meets the weekly guidelines for both aerobic and muscle-strengthening activities (National Health Behavior Interview Survey, 2018). Those numbers fall just below 50% in college-aged students (American College Health Association, 2020). Engagement in MVPA represents a crucial behavioral indicator of physical literacy (Liu & Chen, 2021).

1.4 PA Attitudes

In addition to PA behaviors, attitudes toward PA can impact short- and long-term adoption of health-enhancing levels of PA in adulthood. For this study, attitude was conceptualized as the evaluation of positive, negative, and ambivalent perspectives of PA that impact one's decisions to be active (Merceier et al., 2017; Nelson et al., 2010). Positive attitudes suggest PA is seen as enjoyable, important, and meaningful to oneself, whereas negative attitudes represent feelings that PA is tedious, costly, and unnecessary (Nelson et al., 2010). Utilizing this dual perspective allows researchers to recognize that both positive and negative attitudes exist as opposed to a more traditional unidimensional perspective of more or less positive (Nelson et al., 2020; Simonton et al., 2021).

1.5 Perceived Self-Concept

Lastly, PSC was included as an indicator of importance as it represents one's confidence in their physical abilities and body image (Garn et al., 2012; Marsh et al., 2010). PSC is integral to psychological wellbeing (Garn et al., 2012) and is linked to several benchmarks in national PE standards four and five (SHAPE America, 2014). Positive and negative experiences in PE relates to the development of PSC, which has subsequent impact on several health behaviors (Garn et al., 2012; Trzesniewski et al., 2006). The interconnection between the PE experience and the development of one's physical and social self-image suggest that self-concept is likely a key pillar of PA initiation, adoption, and choice.

1.6 Purpose

The purpose of this study was to examine how young adults' retroactive perceptions of PE content relates to current indicators of physical literacy. Specifically, the current study explored (1) the extent to which the content young adults were taught in PE aligns with their interests and values in adulthood; and (2) the degree to which perceptions of content alignment (i.e., interest and importance) predict indicators of physical literacy in adulthood including MVPA, positive and negative PA attitudes, and physical self-concept.

2. METHODS

2.1 Procedures & Participants

Following university institutional review board permission, investigators contacted instructors of introductory level courses (e.g., Introduction to Biology) to recruit primarily freshman and sophomore students who most recently completed their K-12 school experience. With instructor permission, researchers sent recruitment emails with information on the purpose of the study, all consent related information, and instructions for completing the survey online. The survey link was open for two weeks and surveys took approximately 10 minutes to complete.

The participants ($N= 370$) were 19.76 ($SD= 2.01$) years old on average and 66% female. They reported their average age of their last compulsory PE class as 15.92 ($SD= 1.63$) with a range of 10-18 years old. Participants were predominately freshman and sophomores (68%) with 32% reporting as juniors and seniors. In addition, participants identified as White/Caucasian (61%), Black/African American (18%), Hispanic/Latino/Mexican-American (9%), Multi-racial (6%), Asian/Asian-American (5%), and American Indian/Native Pacific Islander (1%).

2.2 PE Content Beliefs Measures

Using Likert-type responses anchored at points 1 (*highest priority*) and 6 (*least priority*), participants ranked six PE content categories according to the content that was most prioritized (EXPERIENCED), content areas they wished would have been taught (INTEREST), and content that was most important to promoting health and wellbeing now in adulthood (IMPORTANCE). Content options provided were as follows: 1) Team Sports (e.g., football, volleyball); 2) Individual/Dual Sports (e.g., tennis, spikeball); 3) Lifetime Sports/Activities (e.g., golf, swimming); 4) Outdoor Activities (e.g., hiking, canoeing); 5) Physical activity/Fitness activities (e.g., weightlifting, spinning), and 6) Personal, Social, and Responsibility Skills (e.g., Self-planning/management/regulation skills, communication building). These categories were based on previous research on content in secondary PE (Banville et al., 2021; Hodges et al., 2018), unit categories popular to multiple instructional models in PE (Darst et al., 2015; Metzler, 2011), and recommendations for holistic PE identified in the SHAPE America (2014) standards/benchmarks.

2.3 MVPA Measures

The Global Physical Activity Questionnaire (GPAQ; Chu et al., 2015) was used to collect information on self-reported MVPA time currently in adulthood. Participants were asked to report their current moderate-intensity activities as well as vigorous-intensity activities including estimated frequency (e.g., number of days) and duration (hours, minutes) for each component per week. Results were combined to represent average MVPA in a typical week as recommended within the GPAQ manual (Chu et al., 2015). Chu et al. (2015) found this self-reported tool as valid and reliable in young adults with test-retest reliability with objective PA measures.

2.4 PA Attitude Measures

Positive and negative PA attitudes was measured by the dichotomous PA attitudes scale (Nelson et al., 2010). Participants were asked to "Consider your current beliefs in adulthood to select the best answer for the following statements." Positive PA attitudes consisted of six items and negative PA of eight items. An example of a positive PA item was, "If I were physically active most days, it would give me more energy", an example of a negative PA item was, "If I were physically active most days, it would be a hassle". Each item was measured on a 5-point Likert scale ranging from 5 (*agree a lot*) to 1 (*disagree a lot*). Previous research found reliable positive PA ($\alpha = .74$) and negative PA ($\alpha = .82$) factors (Nelson et al., 2010).

2.5 Physical Self-Concept Measures

To report global physical self-concept, participants completed the short version of the Physical Self-Concept Description Questionnaire (PSDQ-S; Marsh et al., 2010). Participants reported on three declarative statements about their perception of themselves including, “physically, I feel good about myself”. They respond to each item on a scale ranging from 6 (*true*) to 1 (*false*). Previous research found a reliable physical self-concept factor ($\alpha = .92$) (Marsh et al., 2010).

2.6 Data Analysis

Data were screened for missing data and outliers. Those who did not complete at least 90% of the survey were removed. Frequency scores were reported on each of the responses for the three content areas by most experienced/interest/importance to the least. Alignment between what was experienced, wished was taught based on interest, and perceived as most important in adulthood was initially compared using frequency distributions and bar charts.

Next, researchers calculated a content interest and importance alignment score for each participant by sorting the data to find their highest-ranking scores per content area in the experienced domains. From there, researchers then subtracted the reported highest experienced content area score from the highest reported interest content area score leaving a differential score between what was reported as experienced in comparison to what areas participants wished were prioritized based on interest. Similar procedures were used to sort and subtract highest ranking scores between experienced content to the most important. Resulting data provided researchers with interest and importance alignment scores. To enhance interpretation of data, scores representing alignment were recoded, ranging from 5 (*strong alignment between what was experienced to what was of interest/most important*) to 0 (*poor alignment between what was experienced and what participants reported as least interested/least important*).

Descriptive statistics, bivariate correlations, and reliability scores for multi-item variables were calculated using SPSS (version 27; IBM). Next, multiple hierarchical linear regression analyses were conducted to explore relationships between alignment scores and outcomes. Each hierarchical model consisted of interest and importance alignment scores as independent variables predicting one of the four outcome variables (MVPA, positive PA attitudes, negative PA attitudes, and physical self-concept). For each model, gender and geographical region were included as covariates. Hierarchical

regression model fit, and significance ($p > .05$) was determined by f-test statistic results for each step of the model, followed by regression path information (unstandardized and standardized betas (β); $p > .05$). Total effect size is identified by the explained variance (R^2) and change in explained variance (ΔR^2) across the steps (Tabachnick & Fidell, 2014).

3. RESULTS

As shown in Figure 1, participants felt that the two categories of content that were most experienced in their PE curricula were team sports (over 40% of students reported as the most frequently experienced content area) and fitness activities (just over 30% reporting as top content experienced).

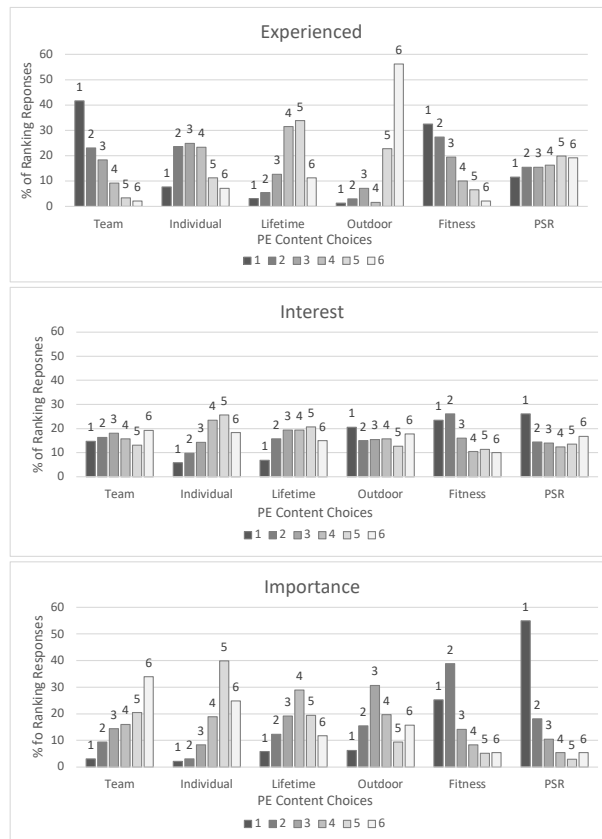


Figure 1. Frequency distributions for ranked by percentage of response on content overall based on (a) What was experienced; (b) what as of most interest; (c) what is most important in adulthood. Scores: "1" (most experienced/interested/important) to "6" (least experienced/interested/important).

However, fitness activities were also reported relatively high (interest and importance scales) suggesting more perceived value for that content. Outdoor activities were the least prioritized category with over 50% ranking it as the least experienced yet was reported as the third highest interest topic ranking score. Activities related to personal and social responsibility (PSR) was a category near the bottom of reported experienced curriculum yet was reported very highly in terms of interest ranking (25% giving a top ranking) and importance for health and wellbeing during adulthood (over 50% giving the top ranking). The most significant misalignment identified with these participants was the number one reported response of team sports in what was experienced in PE and the same content being listed as least interesting and important for health and wellbeing.

Table 1 contains the descriptive statistics for the current study. Cronbach alpha scores reached acceptable levels ($> .70$) for all multi-item variables. Mean scores were just over the midpoint for interest and importance suggesting a moderate level of perceived PE content alignment overall for participations. Correlation findings showed the interest and importance of content scores shared a moderate positive relationship ($r = .36$) and correlated with all variables of interest, other than positive PA attitudes.

Table 1. Descriptive statistics for all latent variables.

	1	2	3	4	5	6
1. Interest	1.00					
2. Importance	.356**	1.00				
3. MVPA	.165**	.142**	1.00			
4. Pos.Att	.070	.001	.250**	1.00		
5. Neg.Att	-.202**	-.167**	.375**	-.314**	1.00	
6. PSC	.162**	.165**	.140*	-.068	-.245**	1.00
Mean	2.55	2.54	3.69	4.16	2.54	8.12
SD	1.89	1.77	3.38	0.54	0.77	3.23
α	N/A	N/A	N/A	0.76	0.87	0.99
Scale	0-5	0-5	0-14	1-5	1-5	1-12

Note. Interest= Alignment of content wished for based on interest; Importance= Alignment of experienced to most important content; MVPA= self-reported MVPA; Pos.Att= Positive PA attitudes; Neg.Att= Negative PA attitudes; PSC= Physical self-concept.

α = Cronbach's Alpha Scores.

** $< .001$, * $< .01$

Positive correlations were identified between interest and importance with MVPA and PSC and a negative relationship with negative PA attitudes, as likely anticipated.

As the final step of analysis, hierarchical regression findings (Table 2) were interpreted to look at content alignment relationships with four important physical literacy outcomes. Model a showed that interest alignment scores ($\beta = .12$) were positively predictive of reported MVPA in adulthood. In opposition model c showed interest scores ($\beta = -.15$) were negatively predictive of negative attitudes, while importance alignment scores were on the cusp of significance as well ($\beta = -.10$; $p = .062$). For physical self-concept (model d), both interest alignment ($\beta = .12$) and importance alignment ($\beta = .13$) were positively predictive of PSC for participants in adulthood.

Table 2. Results of the linear regression models.

Predictor	<i>b</i> (SE)	β	<i>t</i>	<i>p</i> -value	<i>R</i> ²	ΔR^2	<i>F</i>
(a) MVPA							
Step 1					.039	n/a	6.956**
Gender	-1.405 (.381)	-.196	-3.684	< .001			
Region	.020 (.169)	.006	.118	.906			
Step 2					.068	.029*	6.232**
Gender	-1.276 (.379)	-.178	-3.369	< .001			
College	.054 (.167)	.017	.322	.748			
Interest	.214 (.100)	.119	2.133	.034			
Importance	.168 (.107)	.088	1.569	.118			
(b) Pos.Att							
Step 1					.005	n/a	.418
Gender	-.081 (.061)	-.071	-1.322	.187			
Region	-.005 (.027)	-.010	-.185	.854			
Step 2					.010	.000	.484
Gender	-.076 (.062)	-.066	-1.232	.219			
College	-.004 (.027)	-.008	-.152	.879			
Interest	.021 (.016)	.075	1.307	.192			
Importance	-.009 (.017)	-.031	-.504	.587			
(c) Neg.Att							
Step 1					.031	n/a	5.608*
Gender	.281 (.087)	.171	3.241	.001			
Region	-.017 (.038)	-.023	-.433	.665			
Step 2					.076	.045**	7.182**
Gender	.244 (.085)	.149	2.860	.004			
College	-.026 (.038)	-.036	-.695	.488			
Interest	-.063 (.023)	-.154	-2.789	.006			
Importance	-.045 (.024)	-.103	-1.873	.062			
(d) PSC							
Step 1					.084	n/a	16.074**
Gender	-.468 (.353)	-.068	-1.327	.185			
Region	.830 (.156)	.273	5.305	< .001			
Step 2					.127	.043**	12.699**
Gender	-.319 (.347)	-.046	-.981	.359			
College	.870 (.153)	.286	5.671	< .001			
Interest	.209 (.092)	.121	2.266	.024			
Importance	.242 (.098)	.132	2.466	.014			

Note. Interest= Alignment of wished content based on interest; Importance= Alignment of experienced to most important content; MVPA= self-reported MVPA; Pos.Att= Positive PA attitudes; Neg.Att= Negatives PA attitudes; PSC= Physical self-concept.
** < .001, * < .01

PSC was the only outcome significantly related to both interest and perceived importance of content. No significant relationships were identified in predicting positive PA attitudes (model b). The effect sizes of each model were small to moderate, accounting for 7% (MVPA), 8% (negative PA attitudes), and 13% (PSC) of variance for all significant models.

4. DISCUSSION

This study highlighted several areas of misalignment between the content students' experience in PE and what they find interesting and important as young adults. Notably, team sports were highly experienced, but showed steady decreases in both perceived interest and importance in adulthood. This speaks to previous findings that students in PE are generally less

interested in traditional team sports (Banville et al., 2021; Hodges et al., 2018) and perceive different content areas as more relevant to lifelong activity. Although individual sports have also been highly reported in PE, these content areas also were perceived as less relevant overall as compared to fitness and outdoor activities.

These changes in perspective suggest that how PE is defined, and the curriculum offered in pursuit of physical literacy should be reconceptualized. The most significant finding was the desire for wanting PE to be more focused on PSR, learning skills like communication, self-awareness, group challenges, and goal setting. This finding aligns closely with those advocating for the Teaching Personal and Social Responsibility learning components (Walsh & Wright, 2016) and contemporary foci like Social-Emotional Learning Competencies (Wright, 2017). In sum, these preliminary results raise questions about the extent to which the skills, knowledge, and behaviors that are currently being taught in the name of PE are contributing to physical literacy. The results suggest that current curriculum foci on team sports and developing competencies related to team sport are abundant, yet these competencies may not translate to positive relationships with and engagement in PA post-graduation as reported by young adults. In other words, can we expect these outcomes to be valued and important for activity choices in adulthood? Overall, attaining physical literacy using these content areas may be short sighted regarding the hope of transfer for lifelong activity.

When exploring the relationship between content alignment and adulthood physical literacy indicators, results were mixed. Overall, interest alignment scores played the most significant role predicting physical literacy outcomes. For example, higher PE content alignment scores were positively related to MVPA and PSC. Similarly, there was an inverse relationship between PE content interest alignment and negative PA attitudes. Lastly, perceived importance of PE content was positively related to PSC. It is clear that when more alignment between student interest and importance is found the more MVPA young adults report engaging in and the more positive PSC they hold for themselves. However, misalignment was associated with lower reports of these behaviors and beliefs, and the lack of interest was related to a negative attitude toward PA. In impressionable years like those from high

school to college, these negative beliefs can have long term effects and may explain the reduction in active behaviors in conjunction with reported PE content that students do not find valuable.

Overall, it is important to note the effect sizes were relatively small suggesting that other metrics besides content alignment are needed to understand how PE content may influence PA-related behaviors and beliefs into adulthood. Additionally, this exploratory approach to these concepts limits our interpretation of unique PE programs throughout the US and the work on content choices impacting physical literacy outcomes in adulthood needs more consideration. However, this novel approach to explore content perceptions of students and young adults and its relationship with pillars of physical literacy is needed. The outcomes of K-12 PE and the articulation of physical literacy goals and the impact of reaching those goals long term is likely moderated by the content PE teachers choose to infuse in their curriculums. Although much of the previous research in this area has targeted physical literacy skills and knowledge, less is understood regarding the impact on attitudes and beliefs about lifetime PA as a result of “gaining” physical literacy. Students may spend a significant amount of time learning skills and participating in activities that likely do not have long-lasting effect on their beliefs, even though they achieved physical literacy in the mundane and unvalued content they were required to learn. A call for significant changes to what PE represents and what physical literacy is in K-12 PE and adulthood is warranted beyond what has traditionally been reported. Future considerations for evaluating students’ interest in various forms of content, their perceptions of its importance, and quality of instruction are needed to understand how they influence physical literacy outcomes into adulthood.

5. CONCLUSION

Despite the abundance of research and calls to action in PE, less than ideal content choices continue to perpetuate negative memories for many students during adulthood. Our findings confirm previous work that suggests more traditional forms of content are the primary offerings emphasized in secondary PE courses in the United States. It seems that PE programs should consider a stronger focus on student interest when selecting content and, more broadly, that the target purpose of PE and how best to achieve physical literacy may need to be reconceptualizing. Thus, when considering the development of physical literacy, the content selected for PE programs is essential. The alignment between students’ interest and perceived importance of PE content likely has long term effects on PA behaviors and beliefs in adulthood. If the development of physical literacy involves acquiring the skills, knowledge, behaviors, and attitudes for leading active

lives, perhaps it is time to stop placing an emphasis on content toward which adults ascribe little value.

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none

6.2 Conflict of Interest

The authors declare no conflicts of interest.

6.3 Contribution of Authors

KS- lead writer, data analysis, and assisted with data collection; NW- assistant writer and data collection; SF- assisted with data collection and minor writing/analysis role; AG- data analysis and assistant writer.

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