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Tegwen Gadais^a, T. Caron^b, M-B. Ayoub^a, A. Karelis^a and L. Nadeau^c

^a*Department of physical activity sciences, University of Quebec in Montreal (UQÀM), Montreal, Canada*

^b*Faculté des Sports et de l'EP, Université d'Artois, Liévin, France*

^c*Department of physical education, Laval University, Quebec city, Canada*

Corresponding author: Tegwen Gadais, Département des Sciences de l'Activité Physique, Université du Québec À Montréal (UQÀM), Pavillon des sciences biologiques (SB), 141, Avenue du Président Kennedy, Montréal, QC, H2X 1Y4, Canada. gadais.tegwen@uqam.ca

The role of the teacher in the implementation of a School-based intervention on the physical activity practice of children

Abstract

INTRODUCTION: Medium or long term intervention strategies on physical activity practice (PAP) need to be more effective in their implementation by practitioners. The aim of this study was to evaluate the role of a teacher to implement the Team Pentathlon (TP) in order to improve the PAP in children. **METHODS:** 203 children (age: 10-13years), grades 5 and 6 (intervention group [IG] N = 104, control group [CG] N = 99) were guided to increase their PAP during an 8-week period by 5 elementary school teachers (physical education or classroom) who received 4 training sessions. Levels of PAP (self-reported) were compared between groups (IG/CG), sex, socioeconomic status of the schools and between teachers: baseline and during TP. **RESULTS:** Several teachers noted significant increases in PAP in the IG for both boys and girls ($p < .05$ or $p < .01$), whereas others found only small improvements in PAP. One teacher even observed higher PAP in the CG. Training session records revealed that the teacher himself, how the TP is implemented, and proper resources were the 3 elements that explained the successful implementation of the TP program. **CONCLUSION:** The implementation of the TP significantly increased the PAP in children. Training sessions helped teachers to implement the TP program but personal engagement, motivation, respecting protocol and adequate environment are necessary in improving the PAP of children.

Keywords: Physical activity; team pentathlon; sedentary youth; intervention strategy; program implementation.

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Introduction

Sedentary behavior in youth has been well documented over the last two decades (Biddle et al. 2004, Carson et al. 2016, Sallis et al. 2016, Tremblay et al. 2011). Indeed, children and adolescents do not meet the current physical activity recommendations by the World Health Organization (Saunders, Chaput, and Tremblay 2014). Being in a sedentary state appears to be associated with youth obesity, which is considered as one of the major issues of public health for the 21st century by the World Health Organization (WHO). Furthermore, youth obesity may lead to an increase risk of adult obesity late in life. (Mozaffarian et al. 2011, Trudeau, Laurencelle, and Shephard 2004, Lou 2014). In addition, sedentary behavior and/or obesity in youth increases your risk of death, cardiovascular diseases or type 2 diabetes. It also has a negative impact on physical, psychological and social dimensions (Rosenbaum, Tiedemann, and Ward 2014, Saunders et al. 2016, Ravens-Sieberer et al. 2014, Buttitta et al. 2014) as well as in economic costs (Janssen 2012, Sallis et al. 2016). In order to counter these major issues, intervention strategies (IS) were developed and implemented in various sectors (Reis et al. 2016, Naylor et al. 2015, Metcalf, Henley, and Wilkin 2012). Over the last decade, many evidence based studies have determined that the implementation of these IS are associated with an increase in physical activity levels (Kriemler et al. 2011, Metcalf, Henley, and Wilkin 2012, Errisuriz et al. 2018). Moreover, a recent systemic review found that school based programs appear to be one of the most cost efficient IS in increasing physical activity levels (Laine et al. 2014). Other studies have also found which IS seems to be the most effective in girls, young adults or students (Pearson, Braithwaite, and Biddle 2015, Plotnikoff et al. 2015). However, the specific factors that could explain the successful implementation of these IS in children and adolescents are presently unclear (Mehtälä et al. 2014, Harden et al. 2015, Naylor et al. 2015)

Factors that influence intervention strategies implementation

Emerging evidence has identified several factors that could explain why certain IS are more effective in increasing physical activity levels than others. For example, Naylor et al. (2015) identified 22 factors that may influence the implementation of school-based interventions in their review. Interestingly, the top seven factors were directly related to the teacher per se (characteristics, actions and his opportunities in the environment), making this individual a major factor in the success or failure of an intervention program. In particular, his time (teacher overload) or availability, his training, having a supportive school environment, technical support, his skills proficiency as well as his own characteristics, level of commitment and motivation have been found as major elements to explain the successful implementation of intervention programs (Naylor et al. 2015). Another review focused on the characteristics of teachers training in school-based education interventions to improve fundamental movement skills and physical activity practice (PAP) (Lander et al. 2017). The authors from this review found that teachers training that provide pedagogy content, theoretical models or frameworks, follow-ups and technical support to the teacher during the intervention programs, were the most effective factors at improving the students PAP (Lander et al. 2017).

Team Pentathlon Background

Team Pentathlon (TP) is a program that normally lasts eight consecutive weeks during which team members (five or six students per team) must collectively accumulate at least 160 pentathlon hours (HP) (Martel et al. 2011). Also, TP takes place in a school that has a stable environment (Naylor et al. 2015). It should be noted that this intervention program has been recommended to be implemented as an IS (Martel et al. 2006). Previous studies have shown the effectiveness of TP to improve PAP in children (Nadeau et al., 2011), independent of their sex (Gadai and Dionne 2015, Michaud et al. 2012), their

socio-economic status (SEL) (Gadais, Nadeau, and Gagnon 2014) and the season of implementation (Nadeau et al. 2013). In addition, participants have reported a high level of satisfaction and motivation during TP (Martel et al. 2011, Michaud et al. 2012). Moreover, Michaud et al. (2012) analyzed teacher effectiveness to improve PAP and only two teachers out of four that were tested showed significant changes in PAP. However, the study did not provide much information on the factors that could explain the improvements in PAP since the focus was not on the teacher's role per se. Therefore, the factors that could explain the improvements in PAP with the TP remained uninvestigated.

Purposes of the study

This study aims (a) to examine the role of a teacher in implementing the TP in elementary students and its effect on PAP; (b) to identify potential factors that could explain the teacher's performance in implementing the TP successfully.

Methods

This study used a quasi experimental approach, whereby teachers from the same school were randomly assigned to either the intervention group (IG, TP program) or the control group (CG, regular school program). Elementary classroom teachers (CT) and physical education teachers (PET) from the Quebec City area were recruited by email to participate in this study. To participate, the teachers were required to have approval from their school administration and to demonstrate interest from at least 2 classes from the same grade level (grades 5 or 6). All teachers and students gave their written consent to participate in this study and parental consent was also obtained for students.

Participants

A total of five teachers and 203 students (91 girls and 112 boys) from grades 5th and 6th, aged 10-13 years old, from five elementary school of the province of Quebec took part in this study during the winter and spring of 2012 (Table 1). Two schools (1 rural, 1 urban) were from a high socioeconomic level (SEL), one school was considered as a medium SEL (suburbs) and two were from low SEL (1 suburbs, 1 urban). Socioeconomic status of the school was classified by indexes based on the family income of the student that attend the school. These indexes (numbered 1-10) were established by the provincial government of Quebec (Ministère de l'Éducation des Loisirs et des Sports 2011).

All CT and PET ($n=5$) worked closely with the research team during the study. They collaborated daily by helping students to complete the PAP declaration sheet and received 4 training sessions to implement the TP. At the time of the study, Teacher #1 was a woman (30 years old) with 8 years of experience as a PET. Teacher #2 was a woman (40 years old), a PET with 15 years of experience. Teacher #3 was a man (25 years old) with 3 years of experience as a PET. Teacher #4 was a woman (40 years old) with 15 years of experience as a CT. Teacher #5 was a woman (40 years old) PET in two schools with 15 years of experience.

Insert Table 1 here

Instruments

Determination of PAP

The amount of PAP undertaken by students was calculated in Pentathlon Hours (PH), the unit used in TP protocol. The evolution of PAP amount showed how students evolved over the course of the IS (Martel et al. 2011). The PH unit represents a composite unit of time where the actual duration of the activity is weighted according to the assumed

intensity of the exercise. It was created by devising, in collaboration with cooperating PE teachers, correction factors that ensure some energy cost equivalence between the various activities selected by the participants for the duration of each PAP episode reported. For instance, playing soccer during 60 minutes represents 0.75 PH (correction factor = 0.75), jogging during 60 minutes represents 1.00 PH (correction factor = 1), whereas walking during 60 minutes represents 0.25 PH (correction factors = 0.25). These four correction factors corresponded approximately to the four intensity levels proposed by the American College of Sports Medicine (2005) (0.25: light, 0-2.9 METs; 0.5: moderate, 3-5.9 METs; 0.75: vigorous, 6-8.9 METs; 1: very vigorous, > 9.0 METs). As part of the TP, three categories were determined depending on the amount of PAP the students achieved individually at the end of the TP (Nolin and Hamel 2005, Trust for America's Health 2009, Martel et al. 2011). Students were considered:

- "Less active", if they have accumulated an average of 0 to 1.9 PH per week;
- "Active", if they have accumulated an average of 2 to 2.9 PH per week;
- "Very active", if they have accumulated an average of 3 PH or more per week.

Procedure

The study was conducted over 11 consecutive weeks and involved three steps as planned in the implementation protocol of the TP: an introduction step (3 weeks; W1, W2, W3), an implementation step (6 weeks; W4 to W9) and an assessment step (2 weeks; W10, W11) (Figure 1).

Insert Figure 1 here

TP training sessions

During the preparatory step (W1 to W3), the CT and PET received training #1 to inform them about the research project (Appendix A) and collect the basic PAL for participants (W2 & W3). In W3, CT and PET received training #2 to inform them about the rules for implementing the TP with PAP concepts. At the end of the same week, the CT and PET presented the TP to their students (IG) and then proceeded in creating teams that each consisted of five or six individuals. The implementation step lasted for six consecutive weeks (W4 to W9) during which each student used his personal PAP declaration sheet to report every PAP session he or she had performed the day before (Appendix C). Each morning, in the classroom, students were asked to document every session they did by reporting a) the code number of the activity and b) the duration of the period in minutes. The self-reported journals were collected by researchers every two weeks to record the PAP sessions in a computer database. This allowed the preparation of tables (Appendix B) that were provided to the students and their teacher about their participation in TP every others two weeks (W5, W7, W9). These tables periodically showed the student's individual results and the amount of PAP by his team. The tool allowed them to compare their results to the TP standard targets¹ and, if necessary, to regulate their individual and team efforts for achieving their goals. At this stage, CT and PET received training #3 to be able to supervise regulation process with participants. In the end of the implementation step, the CT and PET also received training #4 (enabling him to conclude the TP project and administer the final TP survey). Finally, during the assessment step (W10), the

¹ TP designers established TP standard targets to make sure that participants accumulate minimum PAP amount each 2 weeks throughout the complete duration of TP ("Excellence", "or", "argent", "bronze", "mention d'honneur" symbolic prices).

teacher asked his students to make an assessment regarding their final results at TP. Students also completed a final survey about their participation in the IS.

Data Analysis

Phase 1: quantitative data

Results are presented as means $\pm$ SD. Data analyses were conducted in two steps. For PAP participation, a frequency analysis (descriptive statistics) of PAP sessions was conducted to obtain information about the participation of students regarding their teacher and their SEL. Data were transformed to use a normal distribution (*Log*) and then retransformed to be presented. Analyses of variance (ANOVA) were conducted at baseline and during the TP to detect if significant differences between groups of participants (IG/CG; High SEL/Medium/Low, Gender and Teachers). Mean of W2 and W3 constituted the first measure before TP implementation (1), and W4, W6, W8 constituted the second measure during TP (2). Statistical analysis was performed using IBM SPSS Statistics for Windows, Version 22 (IBM Corp., Armonk, NY, USA). Statistical significance was set at $p \leq 0.05$.

Phase 2: qualitative data

After checking the participants PAP results that were in line with their teacher, we went deeper in the analysis by using records (with audio numeric system) of training sessions #2, #3 and #4. Training #1 was not used because it was mostly information about the research project. We transcribed the verbatim and tried to corroborate PAP results with explanations teachers gave us about the TP implementation they realised in their school. More precisely, we followed Yin (2014) recommendations to conduct a content analysis. A double blind review and coding was conducted by two authors of this study in order to

identify units of sense and concepts in the transcription that could explain the teacher's success in implementing the TP and the participants PAP results.

Results

In total, 203 students from grades 5th and 6th (10-13 years old) participated in this study; 104 (40% boys) comprised the IGs and 99 (49% girls) comprised the CGs. In total, 53% of the children were from low SEL schools, 25% from the medium SEL and 64% from the high SEL. Low, medium and high SEL status were 16%, 13%, 22% in the IGs, respectively and 17%, 12%, 20% in the CGs, respectively.

Intervention effects on PAP

As presented in Table 2, no differences in PAP means were observed between the IGs and the CGs ($p > .05$; $p = .635$) at baseline between teachers ($p = .076$) or SEL ($p = .409$). There was a significant increase in PAP for the IGs ($p < .01$) and a significant decrease in PAP for the CGs ($p < .05$). For CG girls, PAP significantly decreased during TP ($p > .05$), while IG had a small improvement in PAP. IG boys significantly improved their PAP levels during TP ($p > .01$).

Insert Table 2 here

Effects of the teacher on PAP

For medium SEL, teacher 1 (T1) had the most effect on the PAP of children. PAP mean improved significantly for the IGs ($p > .05$) and the PAP was also significant between IG and CG ($p < .01$). Moreover, we noted that girls from the CG decreased significantly their PAP after the TP. Finally, T1 succeeded to improve significantly PAP for girls and boys

from the IG ($p < .05$). In the high SEL, teacher 2 (T2) had a global improvement of PAP but did not reach a statistical significant. We only noted significant differences between girls and boys from both the IG and CG, and a significant decrease for the CG. Teacher 3 (T3) performed slightly better with a significant difference on PAP between the IG and CG during TP ($p > .05$). The effect could be explained mostly by a significant increase in the boys PAP level during TP ($p > .05$). In the low SEL, teacher 4 (T4) had a global improvement of PAP confirmed by a significant difference for the IG after TP ($p > .05$), that could be explained mostly by the significant improvement of boys PAP ($p > .05$). Finally, teacher 5 (T5) did not succeed in improving significantly PAP and her CG had an important increase that was mostly explained by the results of boys from the CG. Others results stayed mostly stabled after TP. T1, T2, T3, T4 improved PAP means for the IG, while the PAP of the CG declined or stay relatively stable. Only T5 obtained a reverse tendency of the results. In this case, CG tended to improve PAP means while IG declined.

Factors associated with a successful implementation

At this point, we analysed further the records of training sessions #2, #3 and #4 to investigate why some teachers succeeded or not to implement the TP with the participants. Content analysis allows us to identify 3 majors categories of explanations (Table 3). The first category of reasons is related to the teacher himself. That is, their *motivation*, their *level of commitment* to the project and their *workload* towards the TP implementation. Personal motivation appeared crucial to justify the teacher's commitment throughout the TP. For example, T1 and T3 mentioned from the beginning they were very motivated in implementing the TP. In contrast, a high amount of work or working at two schools at the same time showed a negative influence. T2 had issues to

implement the project because of the schedule organisation in his school, and T5 had reported to be in a rush and almost decided to leave the project because of it.

Second, TP implementation elements also appeared to be key in explaining the success of the program. In particular, teachers referred to 5 axes: a) *Implementation protocol* had to be well applied (follow researchers guidelines) and it was not always the case in this project. Some teachers decided to follow the guidelines, which resulted in good results (T1, T3, T4), whereas others rearranged the protocol, which resulted in getting negative results (T2, T5). b) *Team creation* was mentioned as a reason by the teachers but various options worked, such as T3 let the students make up the team, while T1 composed teams by balancing strengths and weaknesses. c) Different strategies were used for the *explanations* of TP. All strategies seem to work no matter which format was presented for TP or the place to do it. For example, T1 gave TP session #1 to each separate TP teams and then explained sessions #2 and #3 to the entire group in the gym and then in the classroom. The most important was to provide complete information to students because in the case of T5, PAP episodes were not mentioned and other information was incomplete. d) *Communication* between PET (in charge of TP implementation) and CT (in charge of monitoring PAP each day) is critical to ensure TP monitoring and implementation. T2 and T5 had known issues with the classroom teacher for ensuring follow-ups of the PAP information, while T1 mentioned good collaboration. T4 (classroom teacher) reported no trouble because he was the one in charge of monitoring PAP. Even more for T1, his associate classroom teacher substitute was asked by students to complete the TP sheets. Finally, e) *monitoring and follow-up* was also challenging for the teacher considering the fact that they had to deal with classroom teachers on a daily basis, and monitoring has to be performed on weekends and holidays. To avoid this, teachers organised strategies like giving time early in the morning to complete the sheets,

noting PAP in students diary (T1, T2, T3, T4, T5), or T3 made them totally autonomous with a class routine.

Third, teachers also reported that the students themselves and facilities might influence TP implementation efficacy. *Students types* (not necessarily related to their SEL) could play a positive influence if they are motivated and autonomous in their follow-up in TP, or a negative influence if they don't understand the program and what they have to do. T1 and T3 reported their students were highly motivated to participate to TP, while T2 had to frequently negotiate with students to take time in PE classes to talk about TP. *Sport facilities* nearby the school were also reported as an important key-element in order to make the students active. T4 mentioned many facilities were available for students such as ice hockey arena, swimming-pool or baseball field, and T5 mentioned no facilities in the nearby environment of the two schools.

Insert Table 3 here

Discussion

This study described the impact of an innovative school-based intervention, TP, on PAP of 5th and 6th grade elementary school students. Results showed that students in the IG increased PAP during 8 weeks of TP intervention compared to the students in the CG. We also specifically aimed to understand how a teacher's intervention might impact the PAP of children during TP implementation.

Overall, some elements appear critical to provide an effective TP implementation that could be extended to others PAP program. In a sense, this study confirmed the results of Naylor et al. review (2015) regarding factors that influenced implementation of school-based interventions, but also allows to go forward in knowledge development. The top 7

factors found in their review such as Time (e.g., competing instructional requirements, teacher overload), Availability/quality of resources (e.g., activity resources, personnel, facilities), Supportive school climate (e.g., shared vision/administrative support), Contextual appropriateness (e.g., programme/resource acceptability), Training/workshops and technical support from programme staff, Self-efficacy (e.g., ease of implementation, teacher's skill proficiency) and Teacher characteristics, engagement and motivation, were also noted in our study. In addition, the authors of this review confirmed the essential function of the teacher in charge of the program, but also the best conditions to succeed in its implementation (Naylor et al. 2015, Lander et al. 2017). A motivated teacher that is deeply convinced by the relevance of the program appears to be the corner stone for success. Indeed, his/her commitment for the program and his/her investment with the children makes the teacher the most important factor for the success or failure of the program. Then, implementation of the program has to carefully follow the protocol steps. On one hand, PAP program creators have to carefully create implementation steps for the program and make sure they are valuable and applicable by the practitioners. On the other hand, practitioners need to respect the protocol and provide complete information. In our study, results show that the following factors need to be considered such as proper explanations, team formation, communication between actors, and the strategy to monitor and follow-up the intervention adapted to the context. For example, T1 who had the best results in improving PAP in children, was very motivated by the TP project, was deeply engaged with the children, respected strictly the protocol, took the time to explain the TP, and set up a routine with others coordinators to monitor. The environment was also favorable, which included highly motivated children and good sport facilities around the school. On the contrary, T5 who had the worse results for TP implementation (inverse tendency), was not convinced by TP project, was poorly engaged

with the children (due to the fact he was working at 2 different schools and was overworked), often changed protocol implementation, omitted to explain some parts of TP, tried to organize a routine but the relationship with others colleagues were complex and students were not highly motivated. Also, T5 reported few sport infrastructures nearby the school. For others teachers (T2, T3, T4) that did a standard implementation of TP, children reached overall good results. In the present study, we showed that the context of implementation such as SEL, public or private school, urban or rural school, but also teaching experience, sex or status (i.e., PE, classroom) of the teacher, didn't seem to affect the results of PAP in children during TP implementation, confirming the results of previous studies on TP (Gadai, Nadeau, and Gagnon 2014, Nadeau et al. 2013).

Are there other potential factors that could explain the successful implementation of IS? TP is an 8-week intensive program, thus, this timeframe could be sufficient for the children to experience obstacles, which may result in behavioral changes. This process could be important in the development of self-efficacy for the adoption of healthy lifestyle habits (Stretcher et al. 1986). However, children need to receive constant support from a mentor in order to preserve their commitment (Naylor et al. 2015, Bryan and Solmon 2007, Ryan et al. 2008). Second, TP includes a formal regulation process, which combines individuals and team goals, representing a core aspect of the IS. Achievement of goals can influence extrinsic and intrinsic motivation as well as the adoption of healthy lifestyle habits because meeting one's individual goal, and contributing to the success of the team, is likely to support children's feeling of competence (Vallerand and Losier 1999, Bryan and Solmon 2007). Thus, peer support, which is fostered in the design of TP is also one of the key elements of the self-determination theory (Ryan et al. 2008) and has been associated with the adoption of healthy behaviors (Stretcher et al. 1986). Third, TP aims to promote the development of the students' autonomy relating to their PAP choices. The

development of autonomy is made by promoting decision making and control over behavior (Ryan et al. 2008, Bryan and Solmon 2007). TP allows children to self-manage their individual and team progress toward an “autonomy-supportive” (Bryan and Solmon 2007). Collectively, the teacher plays a crucial role in supporting children with their participation in IS and the improvement of their PAP.

Strengths and Limitations

TP is mainly an extracurricular program, thus it takes minimal classroom time to implement and deliver the program (~1 hour for each 4 training sessions for an 8-week program (6-week in this case). This program can be implemented by the physical education teacher or by any classroom teacher who has daily contact with children. TP requires a minimum of human resources, such as a research assistant or IS coordinator to collect and enter the record sheets that are then analyzed and summarized by a computer program (~1 hour/class/2 weeks).

This study is not without certain limitations. First, we recruited volunteer teachers (N=5) that were not randomly selected for this study. A total of 8 teachers showed interest in participating at the beginning. Workload and motivation to implement TP of the teacher were not controlled in the present study, which could have influenced our results. However, we carefully addressed these issues (training session #1 and #2) with teachers before implementation of the TP. Second, teachers who had two groups of students may have been biased with the CGs and IGs because they were part of the same school. Children could have communicated together about the IS. Considering the results remained significantly different between groups suggests that either an influence did not occur or it did but did not have a significant effect.

Conclusion

This study indicated that the implementation of the TP significantly increased PAP in children. In addition, training sessions helped teachers to implement the TP program but personal engagement, motivation, respecting protocol and an adequate environment (support from the administration and good facilities) are necessary in improving the PAP of children.

Implications for practitioners

This study proposed an innovative way to help students develop their autonomy in making healthy PAP choices with minimal curricular class time. Some lessons can be learned from this study:

- (1) Teacher appears to be the key person in the success or failure for the implementation of the program. To maximize chances of success, the teacher must be motivated and deeply committed to the implementation of an IS. He has to be engaging and supportive with children throughout the implementation. He also has to respect carefully the steps of implementation without omitting any information. In addition, he/she needs the support of his colleagues (e.g., giving time in classroom, collecting data daily) to help him with the implementation. Finally, overloading a teacher or imposing them to conduct the program could be a reason for failure in the implementation of a program (Lander et al. 2017, Naylor et al. 2015).
- (2) Intervention strategy team needs to design a clear and realistic implementation protocol that fits inside the school context and reality. This protocol has to be valid and strictly followed by the person in charge of the implementation (Kriemler et al. 2011, Larson, Hannon, and Brusseau 2015). Respect

implementation protocol prepared by TP creators and researchers especially by giving complete information to the participants in the right timing, create good relations for collaboration tend to ensure positive results.

- (3) Teachers are generally busy with their basic job. To improve the quality of implementation, certain resources are required. IS team must provide support to the teacher and help him/she with all logistical aspects of the implementation (e.g., data collection and analysis, training sessions) in order to facilitate his job (Naylor et al. 2015). In this sense, IS coordinator working outside of the school and available for the teacher, is highly recommended.
- (4) Having a favorable context for the implementation is also recommended. On one hand, the school must be receptive about the IS implementation by facilitate administration tasks (e.g., authorization, communications with parents and others colleagues). On the other hand, sport facilities nearby schools facilitate children' PAP commitment outside of the school (Naylor et al. 2015, Reed et al. 2008).

Human Subjects Approval Statement

This study has received the approval from the Ethics Committee of Laval University (#2011-079 / 18-05-2011).

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Declaration of interest statement:

I, Tegwen Gadais declare this manuscript has not been previously published, is not presently under consideration by another journal, and will not be submitted to another journal before a final editorial decision from Physical Education and Sport Pedagogy is rendered.

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Table 1: Students, Teachers and School Characteristics Involved in the Project

School –Socio Economic Level (SEL) - Teacher	Students groups (grade)	Sex of students		Total (N=203)
		Girls (n=91)	Boys (n=112)	
School #1 – Medium SEL - Teacher 1*	Intervention Group (5 th)	14	13	27 students
	Control Group (5 th)	14	10	24 students
School #2 – High SEL Teacher 2*	Intervention Group (5 th)	8	15	23 students
	Control Group (5 th)	8	12	20 students
School #3 – High SEL Teacher 3*	Intervention Group (6 th)	8	13	21 students
	Control Group (5 th)	10	11	21 students
School #4 – Low SEL Teacher 4*	Intervention Group (5 th)	7	12	19 students
	Control Group (6 th)	12	10	22 students
School #5 – Low SEL Teacher 5*	Intervention Group (5 th)	5	9	14 students
	Control Group (5 th)	5	7	12 students

*: More details about teachers are given upper in the text.

Table 2: PAP Participation Results Regarding each Teachers, CG/IG, SEL

(1)		Girls			Boys			Total		
	Groupe	N	Mean	Mean	N	Mean	Mean	N	Mean	Mean
			HP	HP		HP	HP		HP	HP
			Before	During		Before	During		Before	During
Teacher	CG	14	3,12 ^u	2,17 ^u	10	4,11	4,13	24	3,53	2,99 ^a
1	IG	14	2,77 ^v	3,90 ^{cv}	13	5,27 ⁿ	7,35 ^{cn}	27	3,97 ⁱ	5,56 ^{ai}
Teacher	CG	8	2,30 ^f	1,78 ^g	11	5,05 ^{fo}	3,96 ^{go}	19	3,89 ^j	2,98 ^j
2	IG	9	2,29 ^d	2,56 ^e	15	4,74 ^d	6,09 ^e	24	3,85	4,80
Teacher	CG	9	2,59	2,16	12	1,85	2,30	21	2,17	2,24 ^b
3	IG	8	1,76	2,08 ^h	13	3,06 ^p	4,68 ^{hp}	21	2,59	3,77 ^b
Teacher	CG	12	2,79	2,52	10	4,19	3,79	22	3,42	3,10
4	IG	7	3,09	3,52	12	3,34 ^q	5,38 ^q	19	3,25 ^k	4,70 ^k
Teacher	CG	5	4,27	3,82	7	3,15	4,20	12	3,49	4,04
5	IG	5	1,88	1,70	9	4,22	4,24	14	3,25	3,33
Total	CG	49	3,01 ^t	2,49 ^t	50	3,67	3,68	99	3,28 ^m	2,98 ^m
	IG	42	2,34	2,75	62	4,13 ^r	5,54 ^r	104	3,44 ^l	4,58 ^l
Grand	Total	91	2,68	2,62	112	3,90 ^s	4,61 ^s	203	3,69	4,51
Total										

CG: Control Group; IG: Intervention Group**Significance (p<0,05 b;c;d;e;f;g;h;i;k;m;n;o;p;q;s;t;u;v); (p<0,001 a;l;r)**

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Table 3: Teacher's Reasons to Justify their Performance in TP Implementation

Major Categories	Under categories	English translation of Verbatim
Teacher	<i>Personal motivation</i>	<p>(T2) The teachers didn't bring it up either, you know, sometimes we give ourselves challenges, but this time, there were none.</p> <p>(T4) The kids knew that I jog everyday, and they asked me during recess if we could run together. Can we do this or...? Yes, yes, of course. It really helped the motivation.</p>
	<i>Workload</i>	<p>(T2) And when I used to do that, well me neither, I'm like her, I'm loaded so you know, I have no free time to go anywhere else (...) because, that's it, me I don't have the time to walk around all over the school.</p> <p>(T5) I was overwhelmed, I even wanted drop the project, I told you (...) I didn't have any other moment because when I'm in that school, I have no free time. (...) at the other school I have a free time before dinner. (...) But the thing is I don't have any time at this school. When I'm at this school, I have 5 periods, you know (...) no free time to go. So it had to do it in the gym.</p>
	<i>Investment/engagement</i>	<p>(T3) It was super easy, I was already prepared, (...) before since we saw each other the 1st time.</p> <p>(T4) Well it's my fault, I should've left them at the secretariat.</p> <p>(T2) I even made myself a chart with... on top of their chart I put a cardboard with the rewards they could reach. Both the individual level and the team. Anyway, I hope it's going to motivate them. (...) Well it's because it's all papers that I made for them.</p>
TP implementation	<i>Implementation protocol</i>	<p><u>Conversation #2:</u> (R) You didn't make any adaptations? (T1 answer) No (...) The first time, I went in class and I really followed the plan #1.</p> <p><u>Conversation #3:</u> (T5) Hum no, I relied on the plan (...) Ah, in order, I did it in the order that. (R) That was presented in the plan (T5) Yes. (...) (R) Did everybody send them? (T5) No, because I didn't do my second regulation. (...) (R) And what system, T5, did you use for the Easter period? They left with a particular system? (T5) They had to write it in their agenda.</p> <p>(T4) It's quite easy, it is part of their routine. We start our day, we declare yesterday's physical activities. It became a routine.</p>
	<i>Team formation</i>	<p>(T2) With friends (...) they made their teams.</p> <p><u>Conversation #5:</u> (T3) The teams were formed quickly and it started. (R) Ok. So it went well for that, they are really motivated (...) (T3) Oh yeah (...) (R) So it's the students who made them themselves?</p> <p><u>Conversation #6:</u> (T5) I made them. (R) Ok. On the base of? (T5) On the base of, I put the more athletics with the less athletics. (R) Ok. You balanced the teams.</p>

<i>Explanations</i>	<p><u>Conversation #7:</u> (R) Paired according to complementary team groupings? (T1) Yeah. But, you know, it's because, there's like one who does it all, otherwise there are 3 categories where people never do anything.</p> <p>(T2) I wasn't doing it in the gym, I had the class, but I was doing it during their outdoors period because they have like 2h20, but they were constantly whining. I even had to put my foot down. It wasn't pleasant.</p> <p>(T3) On the other hand, the CM2 did that with their teacher. I went in class in class to implant it, and now they have their paper. (...) it lasted 20-25 minutes. They were placed by team with each their own sheet and, well, I have a good group, it's smooth. (...) I did that in the gym. (...) Well no, because I told them to write on a paper somewhere. (...) Yeah, they left Thursday, and I told them to write Friday, Saturday, Sunday, Monday, Tuesday, when we see each other you have to write it all, you know.</p> <p><u>Conversation#9:</u> (T5) but I didn't talk about the hours, I didn't really. (R) The HP? (T5) Yeah. (...) I explained it in 2 times (...) Well I explained in the class (...) So I went to explain it in the beginning of a class, and then when they came into class, in my class, I took over from for another 15-20 minutes to reexplain. (...) I had taken half an hour in one and half an hour in the other (...) Well I did the first one in the gym. It took 20-25 minutes. (...). Well, I still talked about it a little, but without explaining, you know, the prices that they could get. I still explained a little that it has to be done in teams, but that e didn't have enough points.</p>
<i>Communication</i>	<p>(T2) Well, me it's because I went on vacation and I kind of left that in the hands of the teacher , but she like did not verify the... I don't know if she was stressed or if she had something important to do. She just sent it directly to the secretariat without making the students complete them.</p> <p><u>Conversation#11:</u> (T4) I think Mrs Classroom teacher didn't give them. (R) She has to give them in pairs. (T4) Ok, so I will ask her to give them to me (...) (R) You gave me the questionnaires, is there Mrs Classroom teacher's? These ones? (T4) No. That's what I mean, I will have to claim them. I didn't receive them. (...) (T4) Me, I'm missing 2 (sheets) of the witness group that might have been lost. Yes, it was the weeks when Mrs Classroom teacher was replaced, and unfortunately, I think the substitute teacher didn't check properly or... kid name #1 and kid name #2? It's lost.</p>
<i>Monitoring and follow-up</i>	<p>(T3) Yeah, yeah. Their thing is in the morning, I pass by from time to time.</p> <p><u>Conversation#13:</u> (R) You accompanied the teams, so when they were filling it up, you were there. (T1) Yeah.</p> <p>(T4) I obviously had the sheets, Mrs Classroom teacher had done her homework well. I made sure that all the students had handed it. And mine too (...) the way I made the feedbacks on my part was in class, of course. (...) The subject was brought back in class. And we discussed that each sports developed different</p>

		things and I reminded them that the pentathlon aimed to make them try different things, that there are no sports with more values than others, that the important was to find what we liked.
Environment	<i>Students types</i>	<p>(T2) Well, to be honest, since my groups are generally active, they like to move, to go to class and take the time to explain and to fill all that up (...) they were not very happy. (...) I realised I didn't choose the right group (...) I had a turbulent group which was difficult. (...) the control group teacher is way more organised than the one who does the project. The other one you saw, her sheets are all completed; they're all up to date.</p> <p>(T1) There are even students who wrote me letters stating they want to be chosen. So there was lots of motivation from the get go.</p> <p>(T5) There's a girl that went home and made herself a schedule. (...) She did it for her teammates too. So they were running during recess. They are organised!</p>
	<i>Sport facilities</i>	<p>(T3) It's pretty athletic, we move because there's everything in the area. We have a pool, an arena, nature, everything is close. And Quebec city isn't far so people move.</p> <p>(T4) However, they have a pool in the district you know (...) which is at a walking distance from school and the students are around 10 to 12 years old, usually their parents allow them to walk there. (...) There's a pool, a rink and the Patro who is very close. Yeah, Patro Rocamadour, there's lots of action there. (...) There's the Marchand park, there are a lot of students who declare going skating, the park is right next to the school. So there's the outdoor rink that allows... some of them spend all their winter there !</p> <p><u>Conversation#15:</u> (R) versus T5 who is in a disadvantage environment and has doesn't have access to such things. I don't know if there's a pool near you... (T5) Yes, yes, but they don't go. (...) (R) Is the school turning in a dynamic way? (T5) Well, it's mostly extracurricular in the school (...) Us, we don't have pools... the pool is empty. (...) Well, it has never been open.</p>
2	Legend: R (researcher), T1 (teacher#1), T2 (teacher#2), T3 (teacher#3), T4 (teacher#4), T5 (teacher#5)	

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5 **Figure 1**
 6 **Schedule and Steps of the Study**
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