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Original Article

Teacher or student-centred model? Step-by-step analysis of basic psychological needs of a new sport – goubak

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Abstract:
This study evaluated the satisfaction of basic psychological needs (autonomy, competence, relatedness, and novelty) in Year 5–6 students (10–12 years old) by an alternative and new sport, goubak, using two pedagogical models, i.e., sport education and direct instruction. A total of 110 students (57 boys and 53 girls) participated in a quasi-experimental study. To validate the implementation of both models, the lessons were video-recorded, and 50% of recordings were randomly selected and sent to two independent teachers/researchers outside the study with experience in both models to be evaluated using a checklist. The instrument used was the basic psychological needs in physical education scale, including the items of the novelty need satisfaction scale. Overall, 17 items were used to assess autonomy (4), competence (4), relatedness (4), and novelty (5) in general aspects related to physical education classes before and after the intervention. The anonymity and confidentiality of students were guaranteed at all times as well as ethics considerations. The data were analysed by the IBM SPSS Statistics office software package version 25.0. The performed analysis showed better results for Year 5 than Year 6 for both models; there were no differences by gender, which confirmed the goubak's coeducational character. Though there were no significant differences in the satisfaction of needs for both models, autonomy and competence in the direct instruction model were thwarted. The levels of relatedness and novelty were maintained in both groups. Intergroup differences were better for sport education in relation to autonomy and novelty. In conclusion, the obtained results suggest the positive influence of goubak (regardless of model used) and advantages of student-centred models.
Key words*:* pedagogical models, sport pedagogy, innovative sports, coeducation, gender equity.

Introduction

In the last years, physical education (PE) teaching-learning has highlighted its potential for developing social and personal values, linked to its potential among students (Kumar, 2017). Moreover, collaboration among professionals enforces the adaptability and feasibility of different practices in different and new contexts (Quay et al., 2016). In this sense, some PE research trends about teaching process have encouraged the student relevance and involvement in the lessons through the use of different methodologies like the pedagogical models, as well as alternative contents. On the one hand, in relation to the methods implemented, teacher-centred approaches have been used traditionally in PE, like the direct instruction model (DIM; Metzler, 2017). DIM aims to promote student homework behaviour through explicit instruction, support and commitment to successful practice, focusing on teacher-student interaction (Magliaro at al., 2005). In this model, the teacher is responsible for making decisions during the lessons, such as the organization of groups, the beginning and end of activities, or the initiative of students (Pereira et al., 2015). Moreover, Metzler (2017) underlines that model key is to provide the student as time of supervised activities as possible, in order to the teacher could supervise the practice and support feedback and corrections constantly. Moreover, this model, as well as traditional teaching methodologies, have been associated with the technique-based approaches that not allow the tactical understanding of the game (Hastie & Curtner-Smith, 2006), and develop inflexible techniques non-transferable to various and real game situations (Holt et al., 2006). Finally, some research about DIM show its effectiveness when the goal is to learn movement skills and concepts (Metzler, 2017). Conversely, DIM usually not enhance psycho-social outcomes, such as the satisfaction of basic psychological needs (BPNs; Ryan & Deci, 2017) for its features (Perlman, 2011; Wallhead & Ntoumanis, 2004). However, among the consolidated models described by Metzler (2017), there are others student-centred models like sport education model (SEM), which is able to empower and relinquish responsibility from the teacher to the student. The SEM was introduced in the United States of America in 1994 by Daryl Siedentop, influenced by the *Sport for All* concept developed in Europe and supported by UNESCO. The main objective is to provide real and rewarding sport experiences forming literate, enthusiastic and competent students, and its main features are as follows (Siedentop et al., 2020): (1) Affiliation:

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students are part of a team during all lessons and develop different roles (e.g., captain, coach or referee) to enhance their responsibility (Wallhead et al., 2010); (2) Seasons: usually longer than traditional teaching units (18-24 lessons; Siedentop et al., 2020); (3) Formal competition: in the season, different teams train and compete among them; (4) Record keeping: the data collection of players and teams is carried out to keep the class informed and to increase motivation (e.g., scoring, fouls or wins); (5) Final event: season ends with a final event to know the teams ranking; and (6) Festivity: to celebrate the season closure, foster teams, students motivation and enjoyment, favouring sports culture. These SEM features and purposes have been associated with the improvement of psycho-social variables (Chu & Zhang, 2018), providing input on the satisfaction of the students' BPNs. For example, the autonomy improves with the assignment of responsibilities to the student in the team (MacPhail et al., 2008; Smither & Zhu, 2011); the relatedness improves through affiliation and team problem solving (Perlman, 2010; Smither & Zhu, 2011); and the competence improves when each student plays a role within the team while improving personal skills (Méndez-Giménez et al., 2015; Perlman & Goc-Karp, 2010). However, other studies suggest possible limitations to the relatedness and autonomy due to the high social status of students (Brock et al., 2009). Finally, it has been considered another potential need for its effects on the students' motivation: novelty (González-Cutre et al., 2020). In this regard, it is necessary to provide more arguments when studying BPNs including novelty. On the other hand, the pedagogical content implemented could improve this sense of novelty. The concept of sport in the SEM encompasses a wider range of physical activities beyond traditional sports exclusively (Hastie et al., 2013), because of the lens of *Sport for All* and the need to link this model with alternative sports (Evangelio et al., 2018) makes it necessary to apply with them. There are not many works in the scientific literature that relate alternative sports and SEM (e.g., duni, kickboxing or ultimate; Evangelio et al., 2018). Therefore, in the present study, goubak® (Goubaksport, n.d.) has been implemented as an alternative sport, with the purpose of exploiting some values such as the egalitarian educational sport created from and for the school, ensuring the same initial level of knowledge of all students. 'Throughout the years, sport and physical activities have constantly been adapted, reinvented, or even created from scratch' (Cohen & Welty, 2015, p. 521). In this case, goubak sport has been created from scratch, and its three elements (playing field, goal and ball) have never been seen before, favouring the same level of knowledge and experience offered by a new sport to the students (Manso-Lorenzo et al., 2018). Its internal game logic implies a greater tactical awareness of the players through the '4Rs model' (Hopper, 2003) and some of its rules such as mixed teams, regulated opposition or the peculiar scoring system itself (it allows the addition and subtraction of points) support the *Sport for All* basis. In light of the above, the main objective of this study is to evaluate the satisfaction of the BPNs (autonomy, competence, relatedness and novelty) in students when it is used an alternative and new sport, goubak, according to the features of two models (SEM or DIM). The purpose is to provide results along the lines of other studies that demonstrate the satisfaction of BPNs thanks to a student-centred model as opposed to the reduction of these needs with a teacher-centred model. It is also intended to determine to what extent goubak can have an influence independently of the pedagogical model to be used.

Material & methods

Participants

Table 1. Sample.

	EG1			EG2				
	5ºA (T1)	6ºA (T1)		5ºB (T1)	6ºB (T2)	6ºC (T2)		
Boys	12	12		10	14	9		57
Girls	12	10		14	8	9		53
Total	24	22	(46)	24	22	18	(64)	110

Note. EG1=Experimental Group 1 (Sport Education Model); EG2= Experimental Group 2 (Direct Instruction Model); T1=Teacher 1; T2=Teacher 2.

A quasi-experimental study of non-equivalent groups has been carried out because the sample was not randomized (Ato et al., 2013). A Pretest, Postest with two experimental groups comparison group design is used. To this end, a cooperative research has been carried out among PE teachers and university teacher-researchers through teamwork. This fact has enabled to improve the whole process of designing and implementing educational programs in two experimental groups. The study sample consisted of 110 PE students, aged 10-12 years (M=10.7; SD=0.6), of which 57 were boys (51.8%) and 53 girls (48.2%). The participants belonged to five groups: two fifth and three sixth grades (Table 1). One group of each grade participated in a SEM unit (experimental group 1, EG1; n=46), and the others participated in a DIM unit (experimental group 2, EG2; n=64). These grades were chosen for their suitability for implementing SEM in order to maturity level (González-Víllora et al., 2020). Also, none of the participants had previously developed a training program or unit on goubak. Both groups had not received SEM unit before, but had received units based on traditional styles, combined with other student-centred styles (e.g., guided discovery, reciprocal teaching) before to the study. The units were implemented by two teachers (T1 and T2) from the same school, located in the southern of the Community of Madrid (Spain), both with more than 10 years of experience in PE teaching, and both involved during all the design and implementation process to avoid differences on the implementation of each one. T1 was in charge of teaching groups of Year 5 and one of Year 6, and T2 was in charge of other groups of

Year 6. The assignment of the experimental group 1 (EG1) and experimental group 2 (EG2) was according to two variables: (1) teacher training (T1 had received previous training on SEM and have experience on both models and goubak, while T2 have experience in a conventional methods, DIM and goubak); and (2) the schedule incompatibilities to implement all units for the same teacher. The procedure in which the groups of SEM were assigned guarantees, at least, a comparison between the two models in each educational level (at least a Year 5 and 6 grades in EG1 and EG2).

Procedure

The study was composed of three phases. First, the teamwork created both implementations, emphasizing the time-consuming process of elaborating specific materials to develop the SEM this type of methodology (Sinelnikov, 2009). With the units designed, the school leadership team and the school council were informed, in order to obtain the necessary permissions, as well as the parent's permissions (Faden et al., 1986). In the second phase, the implementation of goubak in the PE required an in-depth knowledge of its rules by teachers. Their rules were clear to teach in both models since an integrated way (see deeply in Manso-Lorenzo et al, 2018): (a) two mixed teams of five players each facing each other around a single central goal (three posts placed in an equilateral triangle on the side one meter inside of a circular goal area); (b) each player has up to five seconds of individual possession to pass the ball to a teammate; (c) the team has up to five passes to score; (d) the way to score is to pass the ball cleanly through the goal to a teammate located on the other side who have to catch the ball before fall to the floor, and without being intercepted by the opponent; (e) all the passes or kicks of the ball have to be made in a vertical way for the shape of the ball (flattened lozenge-like ball); (f) the defending team can only intercept the ball when it crosses the goal (to avoid that the attacking team score), not before (attacking team could pass the ball if they do not try to score), and thus facilitate the participation of all students. These rules were carried out through the requirements or features of each model (Table 2): SEM (e.g., longer lesson plans than traditional ones; pre-season-formal competition-final phase/festivity, or progressive transfer of autonomy from teacher to student) and DIM (e.g., teacher-centred model, constant feedback from teacher to students, or more conventional length of the lesson plans). The duration of both lesson plans aims at checking the effects of goubak according to the characteristics and requirements of pedagogical models. All lessons were applied in the playground, with a length of 45 minutes each/three times per week. And a third and no less important phase, data analysis was processed with the help of statistical programs.

Table 2. Features of the two instructional approaches.

	SEM	DIM
Contents of each lesso	Preseason 1. Unit explanation, students create mixed teams (5-6 players each other. 8 teams). 2. Delivery dossiers to each team/choose roles. 3. Ball manipulation by playing modified games. 4. Kicking ball by playing modified games. 5. Learn the 'Regulated Opposition' rule by playing modified games. 6. Learn the 'Advantage' rule by playing modified games. 7. Learn to passes by playing modified games/friendly games. 8. Learn to score by playing modified games/friendly games. Season 9-16. Two consecutive 7'games /one refereeing Duty team/one team training while others play or referee. Final event/festivity 17. Playoffs / teams who don't play cheer. 18. Final / teams who don't play cheer / awards ceremony.	1. Video presentation. Familiarization games. 2. Exercises to learn how to pass the ball. 3. Exercises to learn how to kick the ball. 4. Exercises to learn how to score. 5. Exercises to learn 'Regulated Opposition' rule. 6. Exercises to learn 'Advantage' rule. 7. Actual game situation without the 'Advantage' rule. 8. Actual game situation with the 'Advantage' rule. 9. Actual game situation with no negative points. 10. Actual game situation with scoreboard. 11. Actual game situation with all the rules. 12. Actual game situation with all the rules.
Student' rol	Participant and spectator of initial explanations. Create his/her own team, name, flag, motto team and chooses his/her roles. Active participant and decision maker (on groups and individually). The students perform the following roles: player, physical trainer; coach, referee, scorer, captain.	Spectator of the explanations. Passive participant and receive constant teacher' feedback and corrections. Accepts teacher-created teams.
Teacher' rol	Class leader, develop initial explanation. Explain roles, work area, material. Supervise and mediate. Guide work on roles in the first sessions and support progressive student autonomy during the lessons.	Responsible for decisions made during the session, such as the organization of groups, the beginning and end of activities, or the initiative of students.
Materials	1 dossier/team (instructions cards on the students' roles; cards with the exercises and games to be performed by the physical trainer and coach; cards to data record by the scorer when his/her team referees like Duty Team; goubak rules). 1 self-built flag per team. 3 class Posters with team names, roles, game schedule and results. 1 goubak set per team (pitch, goal, and ball). 1 goubak scoreboard for the games.	1 goubak set per team (playing field, goal, and ball). 1 goubak scoreboard for the games.

Validating the implementation

Key to the study of the validity of the applied program is to follow the recommendations of Hastie and Casey (2014, p. 423) such as: '(a) a rich description of the curricular elements of the unit, (b) a detailed validation of the application of the model, and (c) a detailed description of the context of the program'.

To validate the implementation of both models, the lessons were recorded and 50% were randomly selected to be validated by a checklist by two teachers/researchers outside the study, with experience on both models. It used the items adapted from Hastie et al. (2013), where six items for SEM and other four for DIM are reflected (Table 3). For their completion, they reflected "Yes" or "No" in each item. The answers of both evaluators were 100% positive.

Table 3. Checklist items (adapted from Hastie et al. 2013).

1.	Group of students go to a designated home area and begin warming up with that group.
2.	Students warm up as a whole class under the direction of the teacher.
3.	Students practice together with their group/team under the direction of a peer leader.
4.	Students practice individually, or in small groups under the direction of the teacher.
5.	Students remain a part of easily identifiable groups throughout the lesson and throughout different tasks.
6.	Student grouping throughout the lesson is variable across tasks.
7.	Performance records are kept by students.
8.	Students perform specialized tasks within their group/team.
9.	Student performance scores count toward a formal and public scoring system.
10.	Student performance scores are not recorded or are recorded in private.

*Items 1, 3, 5, 7, 8, 9 allude to SEM features; items 2, 4, 6, 10 allude to DIM features.

Data collection

Basic psychological needs: in order to analyse the area of affective-social learning (Kirk, 2013), the *Basic Psychological Needs in Physical Education Scale (BPN-PE)* was used (Menéndez & Fernández-Río, 2018). The items of novelty from the he latest version of the Novelty Need Satisfaction Scale (González-Cutre & Sicilia, 2019) were added to check it. Overall, 17 items were obtained that assessed autonomy (4), competence (4), relatedness (4) and novelty (5) in general aspects related to PE classes. The answers provided on 7-points scales (1=totally disagree and 7=totally agree). The instrument was explained to the students, noting the introductory phrase "In my PE lessons..." to be able to respond to each of the items. A Pretest and Postest were realized before and after unit. Anonymity of responses and student peace of mind in completing the test was guaranteed at all times.

Data analysis

The data was analysed by the IBM SPSS Statistics office software package version 25.0. A significance value of $p < .05$ was established. First, the reliability value was determined using the Cronbach Alpha of the instrument used in the data collection. Then the descriptive statistics were collected. From the initial sample of 115 students, five students were discarded for missing several sessions. Since this was a large sample (Chatterjee & Lahiri, 2017) and there were no statistical differences between the two groups through Levene's test for homogeneity calculation, the parametric tests were used. The Mauchly sphericity test was applied, assuming the spherical data to be $p > .05$ (Winer et al., 1991). Preliminary analyses with t-tests for independent samples have been made to check the behaviour of course and gender on the study variables in each group. The effect size has been calculated according to Cohen (1988), who classified it as small, medium and large (.20, .50 and .80). Subsequently, an intra-group analysis has been carried out through a general linear model of repeated means to check the evolution of Pretest and Postest in each group. In this case, F-values to r have been converted to calculate the effect size (Field, 2017) and according to Cohen (1992), it could be small, medium and large (.10, .30 and .50). To finish with an inter-group analysis through a multivariate general linear model that compares the Postest measures between both groups. Precisely, multivariate analysis has been used based on studies that recommend its use for larger samples (Barton et al., 2016).

Results

Cronbach's Alpha obtained to corroborate the reliability of the BPNs scale in PE was .910, according to the values shown in Gonzalez-Cutre and Sicilia (2019). The preliminary analysis carried out through the t-tests for independent samples analysed course and gender on the study groups. The results have been analysed in order to (1) explore the differences among students' grades and genders; (2) assess the satisfaction of the BPNs with each model; and (3) compare the differences between both models after their implementation.

With respect to the grade, the SEM students in Year 5 grade showed values of autonomy in the Pretest ($p = .022$) and Postest ($p = .035$) significantly higher than Year 6 students. With regard to the relatedness, Year 5 students showed significantly higher values than in the Year 6 in the Postest ($p = .029$). Also, it was reported significantly higher values in SEM novelty in Year 5 in Pretest ($p = .011$) and Postest ($p = 0.006$), with respect to Year 6. No significant differences were found in the competence. On the other hand, with regard to the DIM, students in the Year 5 showed significantly higher values in Postest autonomy ($p = .022$), Pretest novelty

(p=0.010) and Postest novelty (p=.000) than in Year 6 grade. No significant differences were found in the competence neither relatedness. There were no significant differences in terms by gender, only significant values in Pretest novelty (p=.020) with better results on girls of SEM group.

Table 4. Preliminary analysis through T-test by course and gender variables.

		SEM								DIM							
		Pretest				Postest				Pretest				Postest			
		M (SD)	t	p	d	*M* (SD)	t	p	d	*M* (SD)	t	p	d	*M* (SD)	t	p	d
Autonomy	5th	5.66 (.80)				5.54 (.81)				5.55 (1.05)				4.88 (1.37)			
	6th	5.04 (.97)	2.36	.022*	.70	4.90 (1.13)	2.18	.035*	.65	4.96 (1.23)	1.95	.055	.52	4.07 (1.31)	2.35	.022*	.60
Competence	5th	4.90 (.83)				4.61 (1.20)				5.28 (1.25)				4.88 (1.59)			
	6th	5.05 (.93)	-.57	.566	.17	5.26 (1.26)	-1.77	.083	.52	5.39 (.95)	-.39	.693	.10	4.77 (1.36)	.29	.770	.07
Relatedness	5th	5.77 (1.17)				5.73 (.94)				5.25 (1.05)				5.20 (1.29)			
	6th	5.60 (.87)	.54	.586	.16	5.11 (.93)	2.25	.029*	.66	5.50 (1.16)	-.88	.379	.23	5.16 (1.32)	.11	.907	.03
Novelty	5th	5.73 (.82)				6.03 (.92)				5.08 (.97)				5.30 (1.16)			
	6th	4.94 (1.17)	2.65	.011*	.78	5.14 (1.13)	2.92	.006*	.86	4.31 (1.20)	2.64	.010*	.71	4.05 (1.36)	3.76	.000*	.99
Autonomy	B	5.23 (1.00)				5.08 (1.14)				4.97 (1.39)				4.36 (1.45)			
	G	5.51 (.84)	-.98	.330	.30	5.40 (.87)	-1.08	.286	.32	5.37 (.95)	-1.3:	.180	.34	4.39 (1.32)	-.08	.929	.02
Competence	B	5.00 (.92)				4.95 (1.37)				5.50 (1.02)				5.05 (1.32)			
	G	4.95 (.83)	.17	.863	.06	4.88 (1.16)	.19	.849	.06	5.20 (1.11)	1.08	.282	.28	4.59 (1.53)	1.29	.200	.32
Relatedness	B	5.66 (.91)				5.47 (.89)				5.37 (1.21)				5.37 (1.30)			
	G	5.71 (1.16)	-.16	.874	.05	5.39 (1.09)	.27	.783	.08	5.43 (1.04)	-.21	.831	.05	5.00 (1.29)	1.16	.248	.29
Novelty	B	5.00 (1.17)				5.42 (1.17)				4.36 (1.32)				4.26 (1.56)			
	G	5.73 (.80)	-2.42	.020*	.72	5.80 (1.02)	-1.17	.247	.35	4.83 (.99)	-1.61	.112	.40	4.76 (1.24)	-1.43	.156	.35

Note: SEM=Sport Education Model; DIM=Direct Instruction Model; *M*=Mean; SD=Standard Deviation; *p=significance < .05; d=effect size; B=Boys; G=Girls.

Table 5 shows the results of the Pre/Postest comparison in order to the satisfaction of the BPNs for each of the two experimental groups (SEM and DIM). The analysis did not report significant differences for SEM with similar values among Pretest and Postest, but novelty increase moderately (p=.073). However, the use of DIM thwarted the satisfaction of autonomy (p=.000) and competence (p=.000) on the students. Relatedness and novelty did not show significant differences for DIM.

Table 5. Intra-Group analysis through the general linear model of repeated means.

	SEM					DIM				
	Pretest	Postest				Pretest	Postest			
	M (SD)	*M* (SD)	F	p	r	*M* (SD)	*M* (SD)	F	p	r
Autonomy	5.37 (.93)	5.25 (1.03)	.783	.381	.13	5.16 (1.20)	4.25 (1.34)	44.32	.000*	.67
Competence	4.95 (.88)	4.93 (1.28)	.019	.891	.02	5.35 (1.08)	4.75 (1.43)	15.54	.000*	.47
Relatedness	5.68 (.98)	5.47 (.99)	1.50	.227	.18	5.45 (1.03)	5.26 (1.22)	2.30	.135	.20
Novelty	5.36 (1.09)	5.63 (1.14)	3.40	.073	.26	4.51 (1.15)	4.35 (1.36)	1.11	.295	.14

Note: SEM=Sport Education Model; DIM=Direct Instruction Model; *M*=Mean; SD=Standard Deviation; *p=significance < .05; r=effect size.

Table 6 reflects the contrasts of customized hypotheses, showing the value of significance in the contrast results (K-matrix) by performing a univariate analysis of variance to compare the two experimental groups, SEM and DIM, for each of the needs in the Postest. The students showed better results for autonomy (p=.001) and novelty (p=.000) with SEM, but not for competence and relatedness.

Table 6. Inter-Group analysis through the multivariate general linear model.

		Helmert´contrasts		
		Contrast estimation	P	Partial eta squared
SEM vs DIM Postest	Autonomy	.860	.001*	.106
	Competence	.108	.686	.002
	Relatedness	.257	.263	.012
	Novelty	1.084	.000*	.147

Note: SEM=Sport Education Model; DIM=Direct Instruction Model; *p=significance < .05.

Discussion

The purpose of the study was to evaluate the satisfaction of BPNs 5th and 6th grade students, when goubak is used according to the features of the SEM or DIM. The results have been discussed in order to their analysis facilitating their understanding: (1) to explore the differences among students' grades and genders; (2) to assess the satisfaction of the BPNs with each model; and (3) to compare the differences between both models after their implementation.

Firstly, comparing both grades, the analysis stated better results in the satisfaction levels of autonomy, relatedness and novelty with the SEM in Year 5 students versus those in Year 6 in the Postest, while they only showed these differences in autonomy and novelty with the DIM. However, some of these differences were observed in Pretest too (regarding to autonomy and novelty on SEM, and novelty on DIM), so these results should be interpreted carefully. Finally, the differences in the relatedness of Year 5 students in comparison with Year 6, could be influenced by arising some conflicts during the lessons observed in relation to the Year 6 students' roles performance, in the same way that the review of Wallhead and O'sullivan (2005), or by the pressure that some students suffer performing some roles within their team (Rocamora et al., 2019).

According to the students' gender, there were no differences between both genders on the satisfaction of the BPNs, contradicting the results of other studies which showed differences on the satisfaction of autonomy (López-García et al., 2018) or competence (Meroño et al., 2016). This suggests that goubak rules and coeducational character, with mixed participation or the way to defend during the game (Manso-Lorenzo et al., 2018), could favour or maintain gender equality and opportunities (Parri & Ceciliani, 2019), unlike other studies focused on more traditional team sports that gave a greater role to boys (e.g., Azzarito et al., 2006;). Moreover, according to Parker and Curtner-Smith (2012, p. 492) 'something more is needed from the teacher if gains in gender equity are to be made', so new sports should be introduced to break the hegemonic masculinity linked to more traditional sports (Connell, 2008). In this way, a more homogeneous level of expertise can be achieved among players.

Secondly, the results showed no significant differences in the levels of satisfaction of the BPNs with the SEM, differing from the results shown in the systematic review of Chu and Zhang (2018), where the authors reflected that SEM implementation contributed to improve autonomy (e.g., Perlman & Goc Karp, 2010; Smither & Zhu, 2011), competence (e.g., Cuevas et al., 2015; Spittle & Byrne, 2009), and relatedness (e.g., Méndez-Giménez et al., 2015; Perlman, 2010; 2011). In this study, this may be due to three reasons: students' previous experience with some student-centred teaching styles (previous studies highlighted the autonomy and responsibility of students who previously tended to participate in teacher-centred models; Smither & Zhu, 2011); the way in which groups were created (students choose their partners and this could not satisfy novelty or the creation of new friendships as in the study of Perlman, 2010); and/or the influence of the implementation of a new and different content (goubak) which could develop lack of students' knowledge about it and over-dependency of the teacher to learn some rules or specific skills. Nevertheless, there are similarities with the study of Brock et al. (2009) in interpreting possible limitations of autonomy and relatedness due to the social status of the student; with the study of Perlman (2010) according to did not show differences on competence; or with Cuevas et al. (2015) who only found substantive differences on competence.

However, present study results reported that the autonomy and competence of the students were thwarted with the DIM. These findings differed from other studies (e.g., Hastie et al., 2013; Pereira et al., 2015) which stated that DIM could contribute at the development of students competence due to this model supports as practice of different skills as possible (Metzler, 2017). On the one hand, the role of the teachers could explain the relationship between a controlling attitude and the thwart of the students' autonomy or competence, because the influence of the teacher control during PE classes through DIM could affect the students' psychological well-being (Bartholomew et al., 2018; Haerens et al., 2015). On the other hand, the thwart of competence may be due to the influence with the motivational climate of the tasks during this model (Kalaja, et al., 2009), as opposed to the positive climate of the SEM (Elliot & Conroy, 2005; Moller & Elliot, 2006; Perlman, 2010). Finally, it is

necessary highlight the difference of the number of lessons intended for the implementation of each model (longer lesson plans in SEM than DIM), and thus could influence the time to develop some learnings of the content, and therefore competence on students, as indicated by Casey and MacPhail (2018) and Hastie et al. (2014).

According to the satisfaction of relatedness and novelty with the DIM, there were not observed differences. The use of goubak could influence that there were no greater thwart of these needs with the DIM because the students learned a new content (novelty) and participated in mixed groups (relatedness). The use of a new content maybe favours novelty in students (González-Cutre & Sicilia, 2019) and in line with Azzarito (2006), it is important to offer coeducational contexts and equal opportunities environments. Contexts that can be generated thanks to mixed teams and goubak rules (Manso-Lorenzo et al., 2018). And this mixed teams can help combat gender stereotypes (Petracovschi et al., 2011).

Lastly, the findings found when comparing both models showed significant differences in satisfaction levels in autonomy and novelty in favour of SEM (table 6). The responsibility transference through roles within the team in the SEM was a key strategy to promote autonomy in the student body (MacPhail et al., 2008; Smither & Zhu, 2011). This may have led to a more active involvement of students (García-López et al., 2012). Moreover, increased the sense of novelty perceived when experimenting this responsibility and methodology (González-Cutre & Sicilia, 2019). Furthermore, in this study the content applied helped to not thwart the novelty, and with an innovative methodology for the students, it was satisfied the need of novelty, as Fernández-Río and Menéndez-Santurio (2017) pointed out in their study about kickboxing applied since SEM hybridization.

Concerning to the comparison of relatedness and competence, it is observed that there were not differences between both models although the SEM had better results than DIM, and thus contrast with the previous studies which showed significant differences between both models (e.g., Burgueño et al., 2018; Fernández-Río et al., 2017). Despite the fact that DIM thwarted the students' competence, there were not founded major differences with SEM because the students of DIM group started with a higher level of competence, decreasing this level considerably while it was maintained on students of SEM group. The responsibility acquired with autonomy, tasks students-assigned and roles could influence on the students' competence, as Fernández-Río and Menéndez-Santurio (2017) reported in their study. On the other hand, the lack of differences on relatedness was motivated by the not increasing of this need with SEM like in other studies (Burgueño et al., 2018), for some conflicts aroused among students of this group (Wallhead & O'sullivan, 2005), or the pressure of some students performing some roles (Rocamora et al., 2019).

Conclusions

In conclusion, some results of the present study differ notably from previous literature, and thus enforce the prospective of the study on this topic. Firstly, it was found better results in 5th grade than 6th grade students, although the fact that positive data was found also in Pretest makes it cautious about this.

Although the BPNs were not satisfied in either of the two models analyzed, the levels of relatedness and novelty were maintained in both groups (SEM and DIM), perhaps due to the influence of an innovative sport like goubak, which promotes equity and mixed participation. Maybe, the fact that students themselves make their own teams during the season in the SEM, has avoided making new and different relationships, with the consequent lack of satisfaction of novelty in this model. While in the DIM, its own features and supposing the sport like an unknown content for the students requiring more teacher participation, the autonomy and competence of the students has could been thwarted. Therefore, it could be considered the influence of goubak in both models and the preferential use of SEM for the implementation of this new sport for PE classes.

According to the limitations of this study, there were detected some of them: (1) despite both implementations were designed to accomplish the features of each model and the purpose of the present study, the difference in the length of the lesson plans could condition some results; (2) the length of the sample for both models were different; and/or (3) both teachers participated in all design and were informed about all considerations, but their personal features could influence on the results. In this sense, future research should replicate the intervention taking account these limitations, as well as the relevance to the teacher and/or the students know the content and methodologies previously, in order to compare how these facts could affect at the analyzed variables. Finally, other factors could be modified like the group configuration, alternate roles within the teams and/or apply or hybridize different models, in order to deepen the goubak teaching-learning.

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