



# Assessing the Effectiveness of Physical Education Instructional Modules in Enhancing Student Learning Motivation

Hsiu-Tin Wu<sup>1</sup>, Dietermar Say<sup>2\*</sup>, Yi-Jin Huang<sup>1</sup>, Joyce Say<sup>2</sup>, Li-Yuan Cheng<sup>3,4</sup>

<sup>1</sup>Department of Physical Education, National Taiwan University of Sport, Taiwan

<sup>2</sup>Department of Educational Psychology and Counselling, National Tsing Hua University, Taiwan

<sup>3</sup>Department of Kinesiology, National Tsing Hua University, Taiwan

<sup>4</sup>Department of Kinesiology, Taiwan Health Technology Management Association, Taiwan

## ABSTRACT

In this research the goal was to explore how physical education teachers, from disciplines adopting a teaching module affected students motivation in physical education classes. The study involved 145 elementary school students split into control groups. They went through an 8 week intervention with the experimental group taught using the teaching module and the control group using a curriculum. A pre-test was done 1 week before to ensure both groups had motivation levels. After the intervention a post-test was given. The study used a tool called the Elementary School Students Physical Education Learning Motivation Scale based on Self Determination Theory. A statistical analysis method called two way ANOVA was used to analyse the data. The results showed that students who received instruction, with the teaching module had motivation levels after eight weeks compared to those who received standard instruction. After analysing these findings it is determined that the design concepts of the physical education instruction module correspond, with the Self Determination Theory's focus on autonomy, competence and relatedness. This module significantly boosts student's drive, in physical education lessons indicating its potential to aid physical education instructors in enhancing their teaching effectiveness.

**Keywords:** Teaching module; Self-determination theory; Physical education

## INTRODUCTION

The modern society, in Taiwan has had an impact on the level of activity among children. Due to the convenience of living and the rise in lifestyles issues like obesity, overweight and cardiovascular diseases have become more prevalent concerns for the public health. The World Health Organization (WHO) highlights that lack of activity ranks as the leading risk factor for global mortality. WHO suggests that children and teenagers should engage in a total of 60 minutes of moderate to exercise daily [1]. A survey conducted in 2018 revealed that a staggering 78% of children and teenagers were not meeting the recommended levels of activity [2]. Apart from guidance the influence of physical education instructors and peers plays a role in shaping children's physical activity habits.

Effective teaching methods and positive peer interactions within physical education classes are factors in encouraging student's engagement in activities. Engaging in exercise and meeting levels of physical activity can contribute significantly to enhancing both the physical and mental well-being as well as improving learning capabilities, among children and adolescents [3,4]. The Sports Administration of the Ministry of Education (2022) reported that 31% of education classes, in primary schools in Taiwan are conducted by part time physical education instructors [5]. Since the introduction of the 2019 curriculum in Taiwan government bodies have been actively working to address the prevalence of part time physical education teachers in schools. The Self Determination Theory, suggests that people possess needs, for autonomy, competence and connection with others [6]. Fulfilling these

<b>Received:</b>	22-April-2024	<b>Manuscript No:</b>	IPDEHC-24-19642
<b>Editor assigned:</b>	24-April-2024	<b>PreQC No:</b>	IPDEHC-24-19642 (PQ)
<b>Reviewed:</b>	08-May-2024	<b>QC No:</b>	IPDEHC-24-19642
<b>Revised:</b>	13-May-2024	<b>Manuscript No:</b>	IPDEHC-24-19642 (R)
<b>Published:</b>	20-May-2024	<b>DOI:</b>	10.35248/2049-5471.21.3.21

**Corresponding author** Dietermar Say, Department of Educational Psychology and Counselling, National Tsing Hua University, Taiwan, E-mail: dsay0928@gmail.com

**Citation** Wu H, Say D, Huang Y, Say J, Cheng L (2024) Assessing the Effectiveness of Physical Education Instructional Modules in Enhancing Student Learning Motivation. Divers Equal Health Care. 21:21.

**Copyright** © 2024 Wu H, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

needs is crucial for promoting growth being and lasting motivation. It argues that the environments and social settings individuals are in can either facilitate or impede the fulfilment of these needs impacting the extent of their drive. Intrinsic motivation emerges when individuals partake in activities, for the pleasure and fulfilment they offer than external incentives or pressures [7]. Ground in the principles of Self-determination Theory, efforts have been made to improve teaching quality and enhance students learning experiences by promoting the Physical Education Module Enhancement Certification Program. This program aims to enhance the knowledge of specialized physical education teachers to ensure a stable educational environment for students. Wu and Chin (2017) have proposed the term "field physical education teachers" for individuals who graduated from fields not related to physical education and lack formal teacher training [8].

The focus of the education teaching module curriculum is, on students. By emphasizing teaching methods and student centred learning the program aims to create an educational environment where teachers can impart knowledge effectively and students are encouraged to actively participate in independent learning during physical education classes [9,10]. Therefore it is crucial for teachers to ignite student's motivation, for learning in the school environment. This research focuses on improving the education curriculum particularly enhancing the teaching skills of physical education instructors. The main objective is to explore how enhancing teacher's competencies can positively impact student's motivation in education classes. This study investigates research questions and hypotheses based on research methodologies and findings using a quasi-experimental approach aligned with current societal trends. By dividing disciplinary physical education instructors into experimental and control groups the study aims to assess the effects of participating in teaching modules on their professional development. Specifically it examines how post training in physical education instruction influences students motivation in these classes. The hypothesis suggests that after undergoing training instructors will enhance their teaching skills and gain insights into education practices. As a result this study seeks to determine whether there is a difference in student's motivation levels, between those taught by instructors who have completed training courses and those who have not. Students enrolled in education teaching courses are expected to show enthusiasm, for learning compared to those not participating in such classes. This research study, conducted using an experimental design included an experimental group and a control group based on specific conditions. The experimental group underwent education teaching modules while the control group followed a physical education

curriculum. The original curriculum and teaching methods for education remained unchanged. Both groups used the Physical Education Learning Motivation Scale to measure changes in student's motivation levels after the classes.

## CASE PRESENTATION

### Measuring Tools

This study contains basic information about the grade, gender, number of days of after-school exercise per week and the time of each exercise of the participating students. The measurement tool is the Chinese Motivation Style Scale compiled by Tu, et al. (2011) and Lin Jiyan, et al. (2010) [11-13]. It is adjusted to be suitable for senior elementary school students. It mainly measures the motivation of students to participate in physical activities during physical education classes. In the past, studies related to physical activities used a weighted method to calculate the total score of Self-determination Motivation for each subscale. The higher the total score, the higher the Self-determination Motivation of the participant [14,15]. This study further examined the total score of Self-determined Motivation using Lin's (2010) cultural motivation scale, and confirmed that it is consistent with the motivation formula used by past scholars [16-18]. Therefore, it is named as physical education class learning motivation, and the calculation formula is, total self-determined motivation score=[intrinsic motivation × 2]+[identity regulation × 1]+[introjected regulation × 0]+[external regulation × -1]+[No motivation × -2].

### Research Procedures

Before starting the phase the researchers explained the study procedures to 2 teachers with interdisciplinary backgrounds. One in the experimental group and one in the control group. The experimental group teacher is certified in the physical education module while the one in the control group did not hold this certification. The experimental group teacher had flexibility in using education teaching modules, whereas the control group teacher followed the traditional teaching approach. These 2 teachers taught senior students who were part of 3 classes each for both the experimental and control groups. The intervention plan included a pre-test during the week of the 2011 year to establish a baseline for student's motivation levels in physical education classes. Following this an 8 week curriculum intervention was implemented, culminating in a post-test on students motivation levels during week 14. Both tests used scales, for consistency. The findings of the study are exclusive to the researcher, and will not affect the teacher-student relationship or students' academic performance (Tables 1 and 2).

**Table 1:** Curriculum of experimental group

Semester Weeks	Number of Teaching Sessions	Teaching Contents
06-Jul	4	Offense and defense-basketball
08-Sep	4	Offense and defense-basketball 3v3
10-Nov	4	Team relay and jump rope training
Dec-13	4	Defensive running-baseball

A total of 16 courses were conducted based on the physical education module course.

**Table 2:** Curriculum of control group

Semester Weeks	Number of Teaching Hours	Teaching Contents
06-Aug	6	Team relay and sports competition events
09-Nov	6	High jump
12	2	Fitness instruction and assessment
13	2	Individual and group jump rope

Following the original curriculum plan, physical education instruction was conducted with a total of 16 sessions.

## Data Analysis

This study used SPSS25.0 statistical software for data analysis. First, it tested the internal consistency of the Physical Education Learning Motivation Scale test tool, and then used descriptive statistics to examine basic information, weekly exercise days and each exercise time, experimental pre-test and changes in mean, standard deviation, skewness and kurtosis of post-test physical education class learning motivation. The main study analysed the impact of group (experimental group and control group) and time (pre-test and post-test) on students' learning motivation using a 2 × 2 two-way ANOVA. When the interaction reaches a significant effect, the simple main effect is used for analysis. If the two-factor interaction does not reach a significant effect, the main effect is used for analysis. A total of 66 questionnaires for this study were distributed to the experimental group and 79 to the control group. After deducting the invalid questionnaires, 32 boys (54%) and 27 girls (46%) in the experimental group received a total of 59 questionnaires, accounting for All 89%. Students in the control group collected 39 questionnaires from boys (55%) and 32 from girls (45%). A total of 71 questionnaires were collected, accounting for 90% of the total. The following uses the number of days of after-school exercise per week and each exercise time of the experimental group and the control group to examine the changes in students' regular exercise habits during the study period. Then, the average and standard total score of learning motivation in

physical education classes was converted after weighting the pre-test and post-test questionnaires. Descriptive statistical analysis was performed on differences, skewness and kurtosis.

From **Table 3**, it can be found that the number of days of exercise per week and the number of students who exercised for more than 30 minutes each time increased in both the experimental group and the control group during the study period. In particular, the number of students in the experimental group who exercised for more than 30 minutes per week increased. The pre-test and post-test (N before=15, N after=22) increased the number of people the most. Each exercise time only exercised for 10 minutes (N before=18, N after=11) and 15 minutes (N before=14, the number of people after N=17) decreased, and the number of people increased relatively by 20 minutes (N before=5, N after=14) and 25 minutes (N before=2, N after=7). In the control group, the number of people exercising on weekly exercise days increased slightly (N before=13, N after=17), and the number of people exercising each time was concentrated below 20 minutes. Therefore, the experimental group is better than the control group in terms of students' regular exercise after class. During the physical education intervention study, the experimental group and the control group have enhanced their regular exercise habits after class every week. In addition to school physical education classes, the motivation for students' after-school exercise is affected. In addition, other potential factors should be implied (**Table 3**).

**Table 3:** Exercise habits comparison between experimental and control groups

Experimental Group (n=59, M=32, W=27)				Control Group (n=71, M=39, W=32)				
Pre-test		Post-test		Pre-test		Post-test		
Number of People	%	Number of People	%	Number of People	%	Number of People	%	
<b>Number of exercise days per week</b>								
1 Day-2 Days	16	27.1	11	18.6	37	52.1	22	31
3 Days-4 Days	13	22	12	20.3	12	16.9	17	23.9
4 Days-5 Days	10	16.9	7	11.9	7	9.9	8	11.3
5 Days-6 Days	5	8.5	7	11.9	2	2.8	7	9.9
Everyday	15	25.4	22	37.3	13	18.3	17	23.9
<b>Duration for each exercise</b>								
10 min	18	30.5	11	18.6	21	29.6	21	29.6
15 min	14	23.7	7	11.9	13	18.3	13	18.3
20 min	5	8.5	14	23.7	20	28.2	12	16.9
25 min	2	3.4	7	11.9	3	4.2	6	8.5
30 min+	20	33.9	20	33.9	14	19.7	19	26.8

**Note:** n=Total number, M=Number of males, W=Number of females

The Physical Education Learning Motivation Scale test tool used in this study has 5 subscales. The internal consistency test showed that intrinsic motivation  $\alpha=0.90$ , identification regulation  $\alpha=0.72$ , introjected regulation  $\alpha=0.84$ , and external regulation  $\alpha=0.79$ , unmotivated  $\alpha=0.91$ , which shows that this test tool has good internal consistency. The total score of Self-determination Motivation was calculated by weighting each variable, and then the main analysis was carried out. Total Self-determined Motivation score=[Intrinsic motivation

$\times 2$ ]+[Identity regulation  $\times 1$ ]+[Introjected regulation  $\times 0$ ]+[Extrinsic regulation  $\times -1$ ]+[Amotivation  $\times -2$ ]. **Table 4** display the results of descriptive statistical analysis show that the minimum and maximum values of each variable range from -16 to 17, the mean ranges from 6.51 to 10.70, the standard deviation ranges from 2.90 to 6.67, and the skewed distribution ranges from -0.24 to -0.75. The kurtosis distribution ranges from -0.27 to 1.31, and most of them conform to the normal distribution and are within the acceptable range (**Table 4**).

**Table 4:** Descriptive statistics summary of elementary school students' physical education learning motivation

	Min Value	Max Value	Mean	Standard Deviation	Skewness	Kurtosis
<b>Experimental Group</b>						
Pre-test	0.33	13.3	7.23	3.23	-0.24	-0.61
Post-test	4	15.7	10.7	2.9	-0.67	-0.27
<b>Control Group</b>						
Pre-test	-16	16.7	6.76	6.67	-0.73	0.64
Post-test	-16	17	6.51	6.37	-0.75	1.31

**Note:** Total score of Self-Determination Motivation  $\pm 18$

## RESULTS

### Variation Number Homogeneity Test

First, Mauchly sphericity and Levene's were used to test the homogeneity of variants of dependent and independent factors. The results were found from Epsilonb that the Gereenhou-geisser value was 1.0 greater than 0.75. The test results showed that the dependent factors did not violate the sphericity assumption of variants. Therefore, No correction is needed to the F-value statistic. However, from Levene's homogeneity variation test, it was found that the pre-test  $F(1,128)=24.774$ ,  $p<0.001$  and the post-test  $F(1,128)=29.746$ ,  $p<0.001$ , the p value reached the significant level, indicating that The assumption of homogeneity does not hold. According to Chiu (2020), when the sample sizes are unequal, it is easy to cause the heterogeneity of the variance to occur [19]. At this time, when the homogeneity assumption of the variance is violated, there is no need to correct the F quality, as long as the correction procedure is used to perform each average post hoc comparison, it is recommended to use Dunnett's T3 method for post hoc comparison. However, this study only has two levels under each factor, which does not exceed the comparison of the averages of more than 3 groups, so there is no need to perform post hoc comparisons. Furthermore, the descriptive statistics of this study show normal distribution, and the skewness and kurtosis are not excessively deviated. Therefore, it will not affect the calculation of statistics. However,

because the more comparisons are made, the possibility of making wrong decisions is higher. In order to improve the rigor of the research results and avoid the problem of excessive expansion of the Type 1 error rate, after passing the overall interaction test, the family system error The rate is used to adjust the significance level of the  $\alpha$  value. The Familywise Error Rate (FWE) is calculated as  $\alpha FW$  divided by the number of comparisons  $j$  ( $\alpha=\alpha FW/j$ ) [19].

### Variation Analysis Results of Learning Motivation in Physical Education Classes

A 2 factor mixed design was used to analyse the influence of group and test time on students' learning motivation in physical education. Group and time were independent variables, and learning motivation was the dependent variable. It can be seen from **Table 5** that the main effect of the group independent factor reached significance,  $F(1,128)=13.407$ ,  $p<0.001$ , and the net effect size  $\eta^2=0.095$ , showing a moderate effect size. The main effect of the time-dependent factor also reached significance,  $F(1,128)=5.754$ ,  $p=0.018$ , and the net effect size  $\eta^2=0.043$ , showing a low effect size, indicating that both the group factor and the time factor have an important effect on learning motivation, influential. The "Group  $\times$  Time" interaction was significant,  $F(1,128)=7.671$ ,  $p=0.006$ , and the net effect size was  $\eta^2=0.057$ , indicating a low effect size. Since the interaction was significant, a simple main effect test was subsequently performed (**Table 5**).

**Table 5:** Summary of two-factor mixed design analysis of variance for physical education learning motivation

Source of Variation	SS	df	MS	F	p	$\eta^2$
Group	349.23	1	349.23	13.407	0*	0.095
Time	167.12	1	167.12	5.754	0.018*	0.043
Group $\times$ Time	222.8	1	222.8	7.671	0.006*	0.057
Within Groups	7051.57	256	55.63	0	0	0
Between Groups	3334.1	128	26.05	0	0	0
Residual	3717.47	128	29.04	0	0	0
Total	7790.72	259	794.24	0	0	0

**Note:** \* $P<0.05$

Through the overall analysis of the two factor variance, it was found that the main effects of the physical education learning motivation factors were significant, so further analysis was conducted with the simple main effect. From the summary table, it can be seen that the time independent variable can be found at the two independent factor levels. The experimental group  $F(1,128)=12.228$ ,  $p=0.001$ , the  $p$  value is less than 0.125 to reach a significant difference, and the control group  $F(1,128)=2.201$ ,  $p=0.783$ , not reaching significant difference. At the level of the 2 dependent factors of the group independent variable, it was found that the pre-test  $F(1,256)=0.257$ ,  $p=0.613$ , which did not reach a significant difference, and the

post-test  $F(1,256)=20.510$ ,  $p=0$ , reach significant differences. The results show that the experimental group students' learning motivation in physical education class showed a significant difference in the mean scores between pre-test and post-test ( $M$  before=7.23,  $M$  after=10.70), while there was no significant difference in the control group ( $M$  before=6.76,  $M$  after=6.51). It can be seen that after eight weeks of physical education intervention, the students in the experimental group were more motivated to learn in physical education class than the students in the control group. The detailed analysis of results is shown in [Table 6](#).

**Table 6:** Summary of simple main effect analysis for physical education learning motivation

Simple Main Effect	SS	df	MS	F	p
<b>Time</b>					
Experimental Group	355.14	1	355.14	12.23	0.001*
Control Group	2.2	1	2.2	0.076	0.783
Error (Residual)	3717.5	128	29.04	0	0
<b>Group</b>					
Learning Motivation Pre-test	7.07	1	7.07	0.257	0.613
Learning Motivation Post-test	564.96	1	564.96	20.51	0.000*
Error (Residual)	7051.6	256	27.55	0	0

Note: \* $p < 0.0125$  ( $\alpha = \alpha_{FW/j}$ ,  $0.05/4 = 0.125$ )

## Summary

This research aimed to explore how different teaching methods impact student's motivation, in education classes. The study involved two education teachers, one in the group and one in the control group teaching senior students from separate schools. The experimental group teacher had certification in physical education modules while the control group teacher did not. The research spanned over 8 weeks with a pre-test conducted in the week and a post-test in the week to evaluate changes in student's motivation. The experimental group received curriculum intervention through teaching modules while the control group followed their class structure. Findings indicated that students in the group showed improvements in their exercise routines after class compared to those in the control group. Students from the group demonstrated increased participation in activities with a notable increase in those engaging for more than 30 minutes per week. The study employed the Physical Education Learning Motivation Scale test tool with consistency analysis suggesting reliability. Descriptive statistics highlighted how students motivation fell into categories such, as motivation, identification regulation, introjected regulation, external regulation and factors related to lack of motivation. The findings showed that student's motivation to learn was positively affected, in the group, where there was a significant rise, in average scores from the initial test to the final test. The data analysis was conducted using SPSS 25.0 software. Involved a  $2 \times 2$  two way ANOVA to assess how group (experimental versus control) and time (test versus final test) impacted students motivation to learn. The overall results indicated effects from both group and time with an interaction effect between the two factors. Further examination

through tests of effects revealed that the experimental group experienced a notable increase in learning motivation from the initial test to the final one while no significant difference was observed in the control group.

The detailed investigation underscored the importance of interventions as students in the group showed a substantial enhancement in learning motivation over an 8 week period. The outcomes highlighted how diverse teaching methods effectively boosted students motivation in education classes. Furthermore it emphasized considering teaching strategies and their influence on students extra-curricular activities. The results indicate that incorporating teaching techniques in education can have a positive impact, on students learning motivation. The group that underwent teaching modules showed improvements, in motivation compared to the control group. These findings offer insights for educators and curriculum developers looking to boost student engagement and motivation in education. The results suggest that the physical education module program effectively enhances teacher's professional skills and boosts student's motivation in education classes. With the influence of this program physical education courses are gaining attention thanks to their approach and numerous possibilities for expansion. When viewed through the lens of Self Determination Theory meeting autonomy, competence and relatedness needs is vital in the physical education module concept. These 3 factors are closely linked to motivational behaviour from both teachers and students perspectives. The study outcomes offer guidance, for education instructors. By creating an environment that supports autonomy offering learning opportunities nurturing students interests providing feedback and encouragement



regardless of teaching methods used can enhance student's motivation in learning during physical education classes.

## Recommendation

This research utilizes Self Determination Theory to elucidate the motivation, behind students learning and incorporates this theory into physical education lesson plans for discussion. It delves into the impact of teacher behaviour on students' academic achievements and drive. Recognizing the role of school settings in promoting children's activity it is recommended that educational authorities prioritize the introduction of specialized physical education instructors at the elementary school level. Presently the high proportion of physical education teachers at the stage along with the governments focus on a competency based curriculum as per the 2019 syllabus raises concerns. The existing certification process for physical education teachers allows them to attain recognition through a single module certification without requiring additional professional development within the certification period. This issue echoes concerns regarding the categorization of professional physical education instructors by governmental bodies. The extensive nature of content covered in education classes necessitates professional growth for interdisciplinary physical education teachers to enhance their specialized and diverse teaching skills thereby fostering better student well-being. Drawing from existing literature and findings from this study, practical recommendations, for enhancing education include educators possessing management abilities, demonstrative teaching skills and adept utilization of instructional resources. Effective management of routines plays a role, in physical education as a lack of organization can lead to disorder and safety concerns in class. Without management teachers may face challenges in achieving their teaching goals and providing effective guidance and feedback. Using demonstrations and teaching aids is more impactful than relying on verbal instructions in physical education classes. However interdisciplinary physical education instructors may encounter difficulties if they lack a foundation in physical education principles and struggle with demonstration based teaching methods. While modular courses offer game based lessons higher grade students require an introduction to sports skill development due to increasing teaching complexity. Furthermore school physical education curricula should align with government endorsed sports activities like jump rope necessitating the use of teaching aids and online resources for teachers who may find mastering sports skills daunting. Regular engagement in communities is essential for educators to enhance their teaching techniques adopt strategies and benefit from shared experiences.

## CONCLUSION

This research focused on student's motivation, for learning without assessing their levels of activity. Future studies should consider using approaches to evaluate the activity levels and motivational involvement of students. This could involve utilizing scales, self-assessments, observations, pedometers and accelerometers. Additionally upcoming research will examine the benefits and drawbacks of methods, from the viewpoints of both teachers and students concurrently. The curriculum design, for education is expected to offer

perspectives and teaching skills to multidisciplinary physical education instructors.

## ACKNOWLEDGEMENT

None.

## CONFLICT OF INTEREST

The author's declared that they have no conflict of interest.

## REFERENCES

1. World Health Organization (2010) Global recommendations on physical activity for health. 1-56.
2. Health Promotion Administration, Ministry of Health and Welfare (2022) Health promotion statistics annual report.
3. Chen PR, Zhuo JL (2005) Children's physical activity level and peer relationships. *Society for Sport and Exercise Psychology of Taiwan*. 7:103-113.
4. Messing S, Rutten A, Abu-Omar K, Ungerer-Rohrich U, Goodwin L, et al. (2019) How can physical activity be promoted among children and adolescents? A systematic review of reviews across settings. *Public Health Front*. 7:55.
5. Sports Administration, Ministry of Education (2022) Annual school sports statistics report for the 2020.
6. Deci EL, Ryan RM (1980) Self-determination theory: When mind mediates behavior. *J Mind Behav*. 33-43.
7. Howard JL, Bureau JS, Guay F, Chong JX, Ryan RM (2021) Student motivation and associated outcomes: A meta-analysis from self-determination theory. *Perspect Psychol Sci*. 16(6):1300-1323.
8. Wu TL, Chin WZ (2017) 105 ~ 106 Annual physical education module teacher certification program. *Phy Edu Sch*. 160:37-45.
9. Zhan EH, Que YQ, Zhang CW (2020) Understanding the core concepts of physical literacy under twelve years of state education. *Curr Int*. 23(3):59-84.
10. Li YW, Zhang CW (2021) Discussion on literacy-oriented physical education teaching in elementary schools-taking the "Physical Education Module" as an example. *Phys Edu*. 186:115-128.
11. Ntoumanis N (2001) A self-determination approach to the understanding of motivation in physical education. *Br J Educ Psychol*. 71(2):225-242.
12. Tu KW (2011) The impact of teachers' autonomy support on primary school children's motivation in physical education classes. National Taiwan Sport University.
13. Lin JY (2009) The contextual impact of perceived teacher autonomy support and autonomy-supportive learning climate on college students' motivation in physical education classes. National Taiwan Sport University.
14. O'rourke DJ, Smith RE, Smoll FL, Cumming SP (2014) Relations of parent-and coach-initiated motivational climates to young athletes' self-esteem, performance

- anxiety, and autonomous motivation: Who is more influential? *J Appl Sport Psychol.* 26(4):395-408.
15. Kolayis H, Sari I, Celik N (2017) Parent-initiated motivational climate and self-determined motivation in youth sport: How should parents behave to keep their child in sport? *Kinesiology.* 49(2):217-224.
  16. Lin CY, Wang TW, Tsai HM, Wu ZH (2016) Social factors and physical activity among adolescents: The mediating effect of self-efficacy. *Society for Sport and Exercise Psychology of Taiwan.* 16(1):61-78.
  17. Fortier MS, Vallerand RJ, Guay F (1995) Academic motivation and school performance: Toward a structural model. *Contemp Educ Psychol.* 20(3):257-274.
  18. Guay F, Vallerand RJ (1997) Social context, student's motivation, and academic achievement: Toward a process model. *Soc Psychol Edu.* 1(3), 211-233.
  19. Chiu HZ (2020) Quantitative research method (2) statistical principles and analysis techniques. Yeh Yeh Book Gallery.