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<https://ejournal.upi.edu/index.php/penjas/article/view/73867>DOI: <https://doi.org/10.17509/jpjo.v9i2.73867>**Effects of Team-Assisted Instructions on Motivation of Vocational High School Students in Physical Education****Zusyah Porja Daryanto\*<sup>1</sup>, Ashadi Cahyadi<sup>2</sup>, Agi Ginanjar<sup>2</sup>**<sup>1</sup>Department of Physical Education, Postgraduate, IKIP PGRI Pontianak, Indonesia<sup>2</sup>Department of Physical Education, Health, and Recreation, STKIP Nahdlatul Ulama Indramayu, Indonesia**Article Info***Article History :**Received August 2024**Revised August 2024**Accepted August 2024**Available online September 2024**Keywords :**cooperative learning, motivation, physical education, team-assisted instruction, vocational high school***Abstract**

In physical education (PE), the lack of motivation becomes a problem in the learning process, leading to the student inactivity and late in participating in physical education lessons. Therefore, it is necessary to use appropriate learning models to increase the student motivation in learning physical education. The learning model that can be used to improve the student motivation is the Team-Assisted Instructions (TAI) as one of the Cooperative Learning (CL) model types. This research aimed to examine the effect of TAI on the motivation of vocational high school students in learning physical education. The research method used experimental research with one-group pretest-posttest design. The participants involved in this study were 25 class X students from one of the vocational high schools in Indramayu Regency selected using the saturated sampling technique. The instrument used in this research was the Academic Self-Regulation Questionnaire in physical education learning for middle and high school students. The data analysis technique of this research employed statistical descriptions and paired sample t-tests. The research results indicate that there is an effect of TAI on the motivation of vocational high school students in learning physical education. Further research is suggested to conduct investigations regarding the TAI model fidelity and the use of references in the implementation of TAI.

## INTRODUCTION

Physical Education (PE) is a learning process that includes cognitive, affective, and psychomotor aspects in achieving learning objectives through physical activity and sports (Ginanjar, 2022). In PE learning, the lack of motivation is one of the problems often highlighted, such as the student inactive and unpunctuality in participating in PE class (Ginanjar, 2019), and the lack of teacher creativity in implementing PE learning leading to student boredom and the lack of student motivation to participate in the learning process (Suhendra, Ginanjar, Mubarak, & Novaldi, 2023).

Motivation is one of the important factors for a student to achieve PE learning outcomes. The student involvement as a driver in carrying out learning activities will determine their learning motivation (R. Ramadhan, Ma'mun, & Mahendra, 2018). In line with this, motivation has a vital function in determining student efforts to participate in the learning process (R. Ramadhan & Effendy, 2021). In addition, motivation is a driver for children to carry out activities in the learning process according to what has been directed by the teacher so that they can complete what the teacher has instructed (R. Ramadhan et al., 2018).

For this reason, it is necessary to use a suitable learning model to increase the student motivation in PE learning. One learning model that can be used to increase the student motivation is the Cooperative Learning (CL) model. CL has four main theories and one of them is motivation (Ginanjar, 2022; Metzler, 2017). In CL, motivation is used to create a structure making the group realize that the only way the group can achieve learning goals is that all of the members contribute and excel, encouraging each student to give their best and starting to interact with the group to achieve the common goals (Ginanjar, 2022; Metzler, 2017).

In CL, various types can be used, including Student Teams-Achievement Divisions (STAD), Team Games Tournament (TGT), Team-Assisted Instruction (TAI), jigsaw, and Group Investigation (GI) (Ginanjar, 2022; Metzler, 2017). One type of CL that is still rarely studied in Indonesia is the TAI type. TAI is a combination of CL and Personalized System for Instruction (PSI) (Ginanjar, 2022; Metzler, 2017). In TAI, team members practice individually with the help of their group members and when a student has completed the

task, other group members check on the student (Ginanjar, 2022). Similar to PSI, there are learning modules that must be completed in TAI. The PSI learning module is more individual, while the TAI is more group in nature. The TAI assessment can be administered by observing the modules that can be completed by the group each week or by individual assessments of all groups who have completed their movement tasks according to the module to get a score (Ginanjar, 2022; Metzler, 2017).

In Indonesia, research using TAI in Physical Education still has few references to be used. TAI has a significant effect on improving soccer shooting of vocational high school students (Ishak, 2017), basketball shooting of junior high school students (Ahmad, Wahjoedi, & Wijaya, 2024), volleyball underhand passing of high school students (Septiana, Komara, & Wiguna, 2022), and dribbling of junior high school students (Palgunadi & Putra, 2020). However, the four studies did not indicate that TAI is a combination of CL and PSI. In addition, there was no module used in those studies, even though this issue has been confirmed and validated by Metzler (2000, 2005, 2017), specifically in PE learning.

Apart from the four aforementioned studies, one of the research results stated that the use of TAI in PE learning, as the opinion of Metzler (2005), influenced social skills of junior high school students (I. Ramadhan, Ulinuha, & Wahadi, 2023). In line with this statement, CL encourages students to learn more positive social skills (Dyson, Colby, & Barratt, 2016; I. Ramadhan et al., 2023) and positive interactions (Wallhead & Dyson, 2017). Although there has been a statement regarding the validation of TAI that TAI is a combination of CL and PSI (Metzler, 2000, 2005, 2017), which was also emphasized by Ginanjar (2022), there is still a need for validating the model fidelity. For this reason, this study implemented TAI on vocational high school students in futsal learning and aimed to test the effect of TAI on the motivation of vocational high school students in PE learning. It had never been used for increasing the student motivation in research applying the TAI model in Indonesia. This research is also expected to provide an insight of the TAI model fidelity.

## METHODS

The research method used the experimental research method with a one-group pretest-posttest design. In the one-group pretest-posttest design, a single group is measured or observed not only after being exposed to a treatment of some sort, but also before the treatment (Fraenkel, Wallen, & Hyun, 2023).

### Participants and Sampling Procedures

Participants involved in this study were 25 in the tenth grade students from one of the vocational high schools in Indonesia selected using the saturated sampling technique (Fraenkel et al., 2023).

### Materials and Apparatus

The research instrument used the Academic Self-Regulation Questionnaire (SRQ-A) for PE in middle and secondary school students adapted from the SRQ-A by Ryan & Connell (1989), consisting of four subscales, namely external regulation (ER), introjected regulation (InR), identified regulation (IdR), and intrinsic motivation (IM). ER and InR, each consists of nine test items. Meanwhile, the IdR and IM, each consists of seven test items. Thus, it includes 32 test items in total. SRQ-A was developed for students at the end of elementary school and middle school using a four-point scale from Very True (score of 4), Sort of True (score of 3), Not Very True (score of 2), to Not at All True (score of 1). The results of the subscale answers were analyzed using the Relative Autonomy Index (RAI) with the  $2 \times IM + IdR - InR - 2 \times ER$  formula. The initial stage of developing the SRQ-A instrument in PE for middle and secondary school students was the translation of the original version into Indonesian language with the help of a professional english translator.

After translating the statements to the Indonesian language version. The researchers adapted the results into PE learning. The language validation was carried out related to the level of language suitability for respondents with the Improved Indonesian Spelling to two expert judgments. The first was a junior high school Indonesian language teacher and the second was a high school Indonesian language teacher. Both of them were from a middle school and a secondary school in one of the vocational high schools in Indonesia. The results from the validation given by the two teachers included corrections for some sentences. After that, an analysis using Aiken's V was carried out.

SRQ-A in PE for middle and secondary students was tested on 200 students consisting of 77 junior high school students and 123 senior high school students with a mean age of 16.41. The results of the first stage analysis of 200 students were analyzed using factor analysis and Cronbach's Alpha for reliability testing with the help of SPSS. There were nine excluded test items, namely test items ER3, ER4, ER6, ER8, ER9, InR2, InR4, InR6, and IM5. After dropping the nine test items in the initial stage analysis, the results of the KMO and Bartlett's Test with the criteria  $KMO > 0.50$  and  $Sig. < 0.00$  (Hair, Black, Babin, & Anderson, 2018) was obtained. From the obtained results, the KMO MSA value was  $0.96 > 0.50$  and  $Sig. 0.00 < 0.05$ . The details are presented in Table 1.

**Table 1.** KMO and Bartlett's Test

Variable	Value
KMO MSA	0.96
Sig.	0.00

Anti-Image Correlation was applied with the criteria of all Anti-Image Correlations  $> 0.50$  (Hair et al., 2018). The results obtained the value of all Anti-Image Correlations  $> 0.50$ . Then, the MSA value could be met and could be analysed without eliminating the indicators used. The details are depicted in Table 2.

**Table 2.** Anti-Image Correlation

Indicator	Value
ER1	0.93
ER2	0.97
ER5	0.95
ER7	0.98
InR1	0.83
InR3	0.71
InR5	0.84
InR7	0.81
InR8	0.96
InR9	0.97
IdR1	0.97
IdR2	0.97
IdR3	0.98
IdR4	0.95
IdR5	0.98
IdR6	0.98
IdR7	0.97
IM1	0.96
IM2	0.96
IM3	0.96
IM4	0.93
IM6	0.95
IM7	0.98

Communalities with the criteria of all Extraction values  $> 0.50$  (Hair et al., 2018) were applied. The results gained all Extraction values  $> 0.50$ , indicating that all indicators had a strong relationship with the factors

formed. The details are shown in Table 3.

**Table 3.** Communalities

Indicator	Extraction
ER1	0.56
ER2	0.77
ER5	0.65
ER7	0.77
InR1	0.74
InR3	0.66
InR5	0.72
InR7	0.60
InR8	0.58
InR9	0.82
IdR1	0.70
IdR2	0.77
IdR3	0.80
IdR4	0.81
IdR5	0.65
IdR6	0.72
IdR7	0.83
IM1	0.64
IM2	0.70
IM3	0.81
IM4	0.84
IM6	0.77
IM7	0.68

Rotated Component Matrix employed the criteria of the loading factor > 0.40 at n = 200 (Hair et al., 2018). The results obtained the value of all loading factors > 0.50 by forming three factors and grouping them into one factor. Thus, all indicators were consistent and suitable for use. The details are presented in Table 4.

**Table 4.** Rotated Component Matrix

Indicator	Component		
	1	2	3
ER1	0.53	0.52	
ER2	0.87		
ER5	0.57		0.55
ER7	0.81		
InR1		0.81	
InR3		0.81	
InR5	-0.50	0.54	0.42
InR7		0.74	
InR8	0.67		
InR9	0.89		
IdR1	0.83		
IdR2	0.87		
IdR3	0.88		
IdR4	0.86		
IdR5	0.77		
IdR6	0.81		
IdR7	0.88		
IM1	0.78		
IM2	0.79		
IM3	0.90		
IM4	0.91		
IM6	0.48		0.73
IM7	0.72		

For the reliability test of the instrument, the Cronbach's Alpha test was administered with the help of SPSS. The results obtained a reliability value of 0.96. For more details, see Table 5.

**Table 5.** Cronbach's Alpha

Cronbach's Alpha	N of Items
0.96	23

The SRQ-A in PE for middle and secondary students gained 23 valid test items with a reliability of 0.96. In ER, there are four test items, while the InR consists of six test items. The IdR involves seven test items, while the IM contains six test items. The SRQ-A grid in PE for middle and secondary students are presented in Table 6.

**Table 6.** Grid of SRQ-A in PE for Middle and Secondary Students

Subscale	No. Item Test
ER	2, 5, 14, 18
InR	1, 8, 13, 19, 21, 23
IdR	4, 7, 9, 12, 15, 17, 22
IM	3, 6, 10, 11, 16, 20

**Procedures**

This study was conducted in nine lessons. The first lesson was used to conduct a pretest, while the posttest was conducted after completing the ninth lesson. The TAI program used futsal passing materials presented in Table 7.

**Table 7.** Treatments of TAI on Futsal Passing Materials

Lesson	TAI Futsal Passing Materials
1	Pretest
2	Futsal passing technique with a 1 meter wide goal target.
3	Futsal passing technique using the inside of the foot by bouncing against the wall.
4	Zigzag dribbling technique ending with a 1 meter wide goal passing technique.
5	Passing technique using the outside of the foot.
6	Futsal passing technique using the outside of the foot by bouncing against the wall.
7	Futsal passing technique using the outside of the foot with a 1 meter wide goal target.
8	Futsal passing technique with a 7 meter distance with target points 1,2,3.
9	Instep pass futsal technique with a 7 meter distance with target points 1,2,3.


Related to the modules, there were eight modules that should be completed by each group during the TAI treatment on futsal passing materials. The example of the TAI module is provided in Figure 1.

**Modul Pertemuan ke 7**  
**Teknik Passing Futsal Jarak 7 Meter Dengan Target Poin 1,2,3.**

**Nama Anggota Kelompok** 1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_  
4. \_\_\_\_\_  
5. \_\_\_\_\_

**1. Tugas Gerak**

- Kaki ditumpu pada samping sejajar dengan bola, lutut ditekuk.
- Sepaklah bola dengan membentuk sudut 90 derajat dengan kaki tumpu.
- Posisi badan dibelakang bola sedikit tegak.
- Tendangan dimulai dengan menarik kaki dan mengayun kedepan.
- Saat berkenan mata melihat bola dan meneruskan pandangan pada sasaran.



**2. Penilaian**

a. Latihlah teknik ini dengan baik untuk mencapai nilai tertinggi sebelum melakukan percobaan

b. Lakukan teknik ini dalam 5 kali percobaan *passing* menggunakan kaki bagian dalam dengan poin tertinggi sebesar 3 poin pada jarak 7 meter dari titik awal *passing* ke titik sasaran. Berikan tanda (O) setiap kali percobaan pada kolom yang disediakan di bawah ini.

Anggota ke	Percobaan 1	Percobaan 2	Percobaan 3	Percobaan 4	Percobaan 5
1	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)
2	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)
3	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)
4	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)
5	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)	1/2/3 (Poin)

**3. Kesalahan umum yang terjadi**

- Posisi kaki tidak seimbang dengan badan yang mengakibatkan arah bola meleset.
- Posisi kaki tidak diayunkan yang mengakibatkan arah bola lemah dan meleset.

**c. Lakukan observasi kepada temanmu ketika melakukan teknik *passing* futsal menggunakan kaki bagian dalam dalam catatlah gerakan yang sudah tercantum dalam materi yang harus dipelajari. Berilah tanda (x) setiap kali melakukan gerakan yang ada pada dibawah.**

Anggota ke	Percobaan ke	Gerakan	
		Sukses	Gagal
1	1		
	2		
	3		
	4		
	5		
2	1		
	2		
	3		
	4		
	5		
3	1		
	2		
	3		
	4		
	5		
4	1		
	2		
	3		
	4		
	5		
5	1		
	2		
	3		
	4		
	5		

Figure 2. Example of TAI Module in Lesson Seven

### Model Fidelity

To achieve the model fidelity, expert judgment should be carried out for validation process as performed by Ginanjar, Ramadhan, Adib, & Effendy (2021) on the STAD. The fidelity of the TAI model consists of three elements, including descriptions of the unit curricular elements, validation of the model implementation, and explanations of the program context, which is in line with the opinion of Casey, Goodyear, & Dyson (2015) regarding the three elements of model fidelity.

The description of the unit curricular elements is related to the groups involved. Each group consisted of five students deliberately selected by the teacher to ensure that each group contained students with different abilities and they did not have a friendship and competition. All groups, in each lesson, did not always have the same members to ensure that all students could interact with each other in different groups in each lesson. All groups were given the same time allocation and treatment. The teacher had prepared a lesson plan and

TAI module before conducting the learning process.

The validation of model implementation is related to the references used, referring to the statement that TAI is a combination of CL and PSI (Metzler, 2000, 2005, 2017). Meanwhile, the implementation of TAI followed the existing procedures from Ginanjar (2022), including the preparation of learning plans, stages of learning using TAI, and the preparation of TAI modules.

The explanation of the program context began with the approval from the university to conduct the research approved by the principal of the school where the research took place. The participants involved were not selected by the researcher but based on suggestions from the teachers approved by the principal. The participants were class X students aged 15-18 years with a mean age of 15.88. The teacher who implemented TAI was the PE teacher at the school concerned. Before providing treatments, researchers coordinated with each

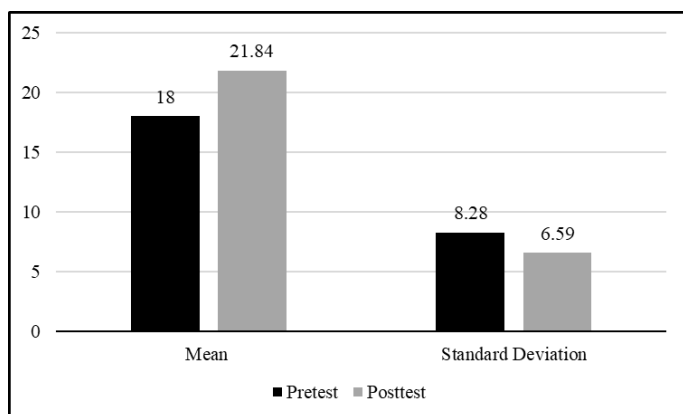
other to ensure that the implementation of TAI was in accordance with the references used.

**Design or Data Analysis**

The data analysis technique in this study used statistical descriptions to examine the mean and standard deviation. Hypothesis testing employed a paired sample t-test with the help of SPSS according to the analysis calculations of Ginanjar (2021).

**RESULT**

The results of the analysis on the pretest obtained a mean of 18 and a standard deviation of 8.28. Meanwhile, the result of posttest analysis obtained a mean of 21.84 and a standard deviation of 6.59. The details can be seen in Figure 2.



**Figure 1.** Example of TAI Module in Lesson Seven

The results of the hypothesis test analysis using paired sample t-test obtained a t count of 4.35 with Sig. 0.00 < 0.05, meaning that there was an influence of TAI on the motivation of vocational high school students in PE learning. For more details, see Table 8.

**Table 8.** Paired Sample T-Test

Variable	t count	Sig.
Posttest >> Pretest	4.35	0.00

**DISCUSSION**

The obtained results showed that there was an influence of TAI on the motivation of vocational high school students in PE learning. Thus, this study supports and complements existing research that the implementation of TAI can provide significant results on high school students, who are equivalent to vocational high school students (Ishak, 2017). In addition, it is also

in line with previous research results prevailing the significant results of the use of TAI at the junior high school level (Palgunadi & Putra, 2020; I. Ramadhan et al., 2023; Septiana et al., 2022). As TAI is a part of CL, the result of this study proves that CL is indeed based on the main theory of motivation (Ginanjar, 2022; Metzler, 2017). Furthermore, since each group in the study consisted of five students with different abilities, the motivation could increase as balancing groups on performance abilities would allow the student motivation to increase (Ginanjar, 2022; Metzler, 2017).

In addition, the contribution of each group member when learning PE using the TAI model, as the part of peer teaching in CL, was apparent. For example, when a student had completed the TAI module with good results, other students who had not completed the task would ask the student to help and provide a way to complete the movement task in the TAI module to achieve a good result. The students also looked enthusiastic when their works were appreciated by their friends in their group and helped their friends optimally, indicating a well-maintained social aspect and positive interactions. This is in line with the statement that all members are responsible for contributing to the success of the group so that there is a strong motivation for students to support, encourage, and teach each other to achieve goals of the group, encouraging a full participation of all group members (Ginanjar, 2022; Metzler, 2017). Furthermore, CL is a model in which students learn in groups (Barrett, 2005; O’Leary, Wattison, Edwards, & Bryan, 2015; Slavin, 1991) and help each other to learn the learning material (Barrett, 2005; Slavin, 1991). In addition, CL has a consistent impact on the social aspect of PE learning (Dyson, Linehan, & Hastie, 2010), encouraging students to learn more positive social skills (Dyson et al., 2016; I. Ramadhan et al., 2023) and positive interactions (Wallhead & Dyson, 2017).

Therefore, this study is also relevant with previous research prevailing that the implementation of CL could improve PE learning outcomes such as in pencak silat front kicks (Ginanjar et al., 2021) and provide significant implications for students (O’Leary et al., 2015) and their learning motivation results (Suhendra et al., 2023).

*Research on The Implementation of TAI in Indonesia*

There had been four published studies regarding TAI in Indonesia (Ishak, 2017; Palgunadi & Putra, 2020; I. Ramadhan et al., 2023; Septiana et al., 2022).

The researchers were concerned because previous research did not seem to have a strong validation, since the main references did not lead to specific CL and TAI for PE learning. Meanwhile, CL must be well structured to produce a positive impact on the student prosocial behavior with various elements to produce a significant effect (García-González, Santed, Escolano-Pérez, & Fernández-Río, 2023). In addition, a module should also be used in the implementation of TAI, since it is a combination of CL and PSI. Therefore, it is essential for future research to comprehensively understand the PSI before implementing the TAI.

## CONCLUSION

This study concludes that there was an influence of TAI on the motivation of vocational high school students in PE learning. Further investigation is needed related to the TAI model fidelity. For further research, it is essential to comprehend the validated TAI references, specifically for PE learning to reduce errors in implementing the TAI in PE learning.

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## CONFLICT OF INTEREST

The authors declared no conflict of interest.

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