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Problem-based learning versus teaching personal social responsibility: efforts to improve students' responsible attitudes and learning motivation

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ABSTRACT

Background: The application of learning models in physical education (PE) had increased significantly, but there was limited research that investigated the comparison of two different learning models in improving students' responsibility attitudes and learning motivation at the university level. **Research Objectives:** This study aims to investigate the effects of problem-based learning (PBL) and teaching personal social responsibility (TPSR) models towards the improvement of students' responsibility attitudes and learning motivation. **Methods:** This study applied a true experiment method with a pretest-posttest control group design. There were 30 students who participated at the university level who were allocated into PBL [male: n = 10; female: n = 5] and TPSR (male: n = 10; female: n = 5). The PBL and TPSR programmes were implemented for 12 weeks. The responsibility attitudes and learning motivation were measured in the pre- and post-test. **Finding/Results:** The findings in this study indicated that the PBL and TPSR models had a significant positive effect on improving responsibility attitude and learning motivation. However, a higher increase was found in the TPSR group compared to PBL. **Conclusion:** Thus, both learning models, PBL and TPSR, can be used as a solution to improve responsibility attitudes and motivation among students during physical education learning.

Keywords: Learning model; responsibility attitude; motivation; physical education

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INTRODUCTION

Organising Physical education (PE) is an important aspect in building and developing the potential of students (Bessa et al., 2021). PE learning that is integrated at the university level must be able to develop all aspects comprehensively, such as

psychomotor, social cognitive (Manzano-Sánchez, 2022), as well as those related to students' responsibility attitudes and learning motivation.

Responsibility attitude is an important aspect that must be considered and developed in students (Koutelidas et al., 2022), since a high level of responsibility will lead to positive behaviour, such as completing assignments on time, high attendance rates, and high interest to learn in PE classes (Septiadi & Saputri, 2020). Meanwhile, students with a low level of responsibility show negative behaviours such as not doing assignments, low attendance, and not listening to lecturers' instructions. This is also reported by previous studies, that many acts of violence occured in class which is categorised as a serious problem internationally (Manzano-Sánchez & Gómez-López, 2023; Manzano-Sánchez et al., 2024). Meanwhile, other study data report that students with low levels of responsibility tend to frequently involve in criminal acts, such as brawls, drinking alcohol, free sex and other negative acts (Setiawan et al., 2021).

Another aspect that has an important role for students to carry out the physical education process is learning motivation (Sotos-Martínez et al., 2023; Ferriz-Valero et al., 2022). Several theories explained that motivation related to a person's desire or encouragement in carry out activities without coercion from anyone (Chu et al., 2022; Romadhona et al., 2024). Motivation can also be interpreted as transformation from negative energy to positive energy which is indicated by a shifting feeling from unwilling to be willing to carry out activities (Franco et al., 2021). According to the Self-Determination Theory (SDT) motivation arises due to interaction between lecturers and students, which encourages students to act (Simón-Chico et al., 2023). Motivation can trigger a spirit in learning physical education, so that student participation in learning movement will be more optimal (Moreno-Murcia et al., 2024). Data explains that the motivational aspect is a parameter for students to undergo academic processes in schools and determinants of the good or bad achievements that will be achieved (Kurniawan et al., 2022). Considering the importance of responsible attitudes and learning motivation for students, a model approach that can be integrated into the learning process of physical education is needed. There is a learning model that is expected to be able to increase responsibility and motivation in learning by applying the problem-based learning (PBL) model and teaching personal social responsibility (TPSR).

PBL is interpreted as a learning model that the teacher provides problems and freedom to students in order to solve and find solutions independently (Bara & Xhomara, 2020; Kasuga et al., 2022; Wijnia et al., 2024). Based on the literature, PBL has been used in the health sector until various educational contexts (Akcay & Benek, 2024). In the learning process in PE classes by implementing the PBL model, the teacher gives a problem, namely a movement task or a task in the form of a game, with the teacher provides problems and students are indirectly trained to improve their learning outcomes (Rahmadi et al., 2023). According to Luo (2019), this model emphasises student-centeredness, which required students to discuss and work together among friends/teams to solve problem and find the right solution. Several previous studies emphasized benefits provided by PBL, for example Dupri et al. (2020), reported that the implementation of PBL during PE showed an improvement in student learning outcomes. Meanwhile, reports from other studies showed that PBL could improve critical thinking and motivation (Festiawan et al., 2021).

The second model that has the power to improve responsible attitudes and motivation is TPSR. This model presents a learning process through sports or physical activities to improve students' personal and social responsibility. The popularity of the TPSR model is increase significantly and has been widely studied by several researchers in the world

(García-Castejón et al., 2021; Manzano-Sánchez & Gómez-López, 2023; Raharjo et al., 2023; Santos et al., 2020). Several previous studies demonstrated that TPSR has positive benefits, such as: improve students' bad character into good character (Setiawan et al., 2021), increase self-efficacy (Carreres-Ponsoda et al., 2021), self-confidence, academics and reduce behavioural problems that often occur in students (Baptista et al., 2020; Shen & Shao, 2022). Meanwhile, recent research on TPSR reported that TPSR had a positive impact on emotional and social (Aygun et al., 2024). Other studies had found that using TPSR in physical education learning was an effective way to influence the level of psychological need, motivation, prosocial behaviors and classroom climate (Manzano-Sánchez et al., 2019). Although many previous studies had investigated PBL and TPSR, to the best of our knowledge, there had been no study comparing PBL and TPSR to improve responsible attitudes and motivation. Therefore, the purpose of this study was to test the effects of PBL and TPSR models on improving the responsible attitudes and learning motivation of students majoring in physical education.

METHOD

Ethics

This study has been approved by the local ethics committee of Dehasen University Bengkulu, Indonesia (registration number: UDB.57/08/2024). In addition, all activities in this experimental study follow the Declaration of Helsinki.

Participants

There were 40 physical education students from Dehasen University Bengkulu (Indonesia) involved in this study. They were selected based on the inclusion criteria: (i) first-year students, (ii) not participating in any activities or championship events. While the exclusion criteria were students who were injured or sick, (ii) students who were participating in other activities (see Fig. 1). There were 30 out of 40 students (male: n = 20; female: n = 10) who were selected and participated in this study. Prior to this study, each participant got information about the rules and benefits of this study. In addition, they were required to sign a letter of willingness to become participants in this study. Data about the age, height, weight, body mass index, and learning experience of students is presented in Table 1.

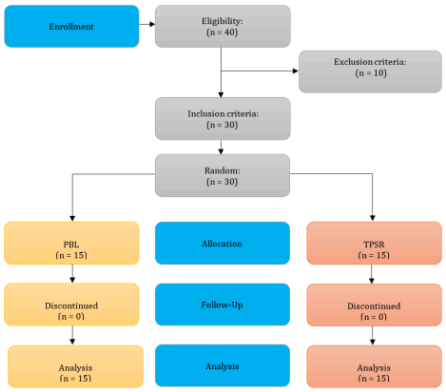

Figure 1. CONSORT Flow Chart

Table 1. Age, Height, Weight, Body Mass Index and PBL and TPSR Learning Experience

Characteristics	Mean ± Standard deviation	
	PBL	TPSR
Gender [male: female] (f)	10:5	10:5
Age (y)	18.9 ± 0.743	19.3 ± 0.724
Height (cm)	158 ± 1.71	160 ± 1.79
Weight (kg)	57.1 ± 1.62	58.3 ± 1.94
Body mass index (kg•m−2)	22.0 ± 1.00	22.5 ± 1.19

Note: PBL = Problem-based learning, TPSR = teaching personal social responsibility.

Instrument

Responsible attitudes

The instrument to measure the level of students' responsibility attitudes was adopted from a previous study (Manzano-Sánchez & Gómez-López, 2023). This instrument has two dimensions, namely: (i) personal responsibility, which has seven question items (e.g., I want to develop), and (ii) social responsibility, which has seven question items (e.g., I respect others). These questions were answered by using a Likert scale from 1 (strongly disagree) to 6 (strongly agree).

Learning motivation

Based on previous studies, the Questionnaire on Motivation in Physical Education (QMPE) measured the level of motivation among students (Ferriz-Valero et al., 2022). His instrument has 20 items from 5 factors, namely: (i) intrinsic motivation has 4 items (e.g., PE is very fun), (ii) identified regulation has 4 items (e.g., I learn skills that are useful for my life), (iii) introjected regulation has 4 items (e.g., I have to do it better), (iv) external regulation has 4 items (I have to show my best because teachers and friends can see it), and (v) amotivation has 4 items (I don't know the reason for the need to do PE). QMPE questions were answered by using a Likert scale from 1 (strongly disagree) to 5 (strongly agree). QMPE has a reliability value of > 0.70.

Procedures

This experimental research with a randomised controlled trial (RCT) was conducted for 6 weeks from July to August 2024 (see Fig. 2). The detailed activities in this RCT research are:

Pretest

In this activity, thirty participants took the test by filling out the questionnaire of responsible attitudes and learning motivation from 08.00 to 09.00 am at the sports field of Dehasen University, Bengkulu. During this activity, the participants were closely monitored by the research team so that the results of the filling could be obtained objectively. After filling out the questionnaire, the participants returned it to the research team.

Intervention program

In this activity, thirty participants were allocated into PBL (male: n = 10; female: n = 5) and TPSR (male: n = 10; female: n = 5) groups. The lecturer who taught in the PBL class had the initials "FEP" and had more than 5 years of teaching experience in PE and mastered the PBL model. While the lecturer who taught in the TPSR class had the initials "S" with more than 6 years of teaching experience in PE and mastered TPSR. The intervention programme was carried out at the sports field of Dehasen University,

Bengkulu, from 07.00 to 08.00 am. Before the programme started, all participants were required to do a warm-up (5 minutes). Then, the PBL and TPSR programmes last for 1 hour, and the lecture subject was soccer. Lastly, all participants did a cool-down (5 minutes). This intervention programme was carried out for 6 weeks with 3 meetings (Monday, Wednesday, Friday) in a week (see Table 2).

Posttest

In this activity, thirty participants carried out a questionnaire filling test of responsible attitudes and learning motivations from 09.00 to 10.00 am at the sports field of Dehasen University, Bengkulu. In this activity, all participants were closely monitored by the research team. The filled questionnaires were collected and sent to the research team.

Figure 2. RCT Experimental Study Flow

Table 2. PBL and TPSR Programmes for 6 Weeks

Weeks	Activities	Duration	PBL	TPSR
1-2	Warm-up	5 minutes	Jooging and PNF	Jooging and PNF Apperception
	Lesson	1 hour	**Determining the problem:** In this activity, lecturers and students determine the problem with movement tasks that should be studied in today's meeting (the lecturer gives task to find types of exercises for basic shooting techniques). **Experiment:** In this activity, students independently search several types of basic shooting techniques from various sources such as: YouTube, books, journals. **Discussion:** In this activity, students discuss the results that they find about basic shooting techniques. **Presentation:** In this activity, students	**Awareness talk:** In this activity, lecturers and students determine the level of responsibility they want to learn, namely level 1 (respect) and level 2 (participation). **Lesson Focus:** In this activity, students learn the level of respect through soccer games. For example, if there is a conflict between players, it can be resolved peacefully without any commotion. In addition, after the game is over, each team must shake hands and respect each other. [32] In level 2, students learn participation when they are actively involved in the soccer game and evaluate how much respect they have for the rights and feelings of other people, how

Weeks	Activities	Duration	PBL	TPSR
			demonstrate the types of basic shooting techniques.	much practice and effort they show during the process of playing football. **Group Meeting:** In this activity, lecturers and students discuss the level of respect that has been learned in the game of soccer. **Reflection Time:** In this activity, lecturers and students evaluate the attitude of responsibility that has been learned in level 1 and level 2. This session is designed so that students can reflect and evaluate how much they respect the rights and feelings of others, how much practice and effort they show during the soccer game.
	Cool-down	5 minutes	PNF	PNF
3-4	Warm-up	5 minutes	Jooging dan PNF	Jooging dan PNF Apperception
	Lesson	1 hour	**Determining the problem:** In this activity, lecturers and students determine the problem with movement tasks that should be studied in today's meeting (the lecturer gives task to find types of exercises for basic dribbling techniques). **Experiment:** In this activity, students independently search several types of basic shooting techniques from various sources such as: YouTube, books, journals. **Discussion:** In this activity, students discuss the results that they find about basic dribbling techniques. **Presentation:** In this activity, students demonstrate the types of basic dribbling techniques.	**Reflection Time**: **Awareness talk:** In this activity, lecturers and students determine the level of responsibility they want to learn, namely level 3 (independence). **Lesson Focus:** In this activity, students learn level 3 (independence) through soccer games. For example, students must play basic soccer technique exercises independently. **Group Meeting:** In this activity, lecturers and students discuss level 3 (independence) which has been studied in the game of soccer. **Reflection Time:** In this activity, lecturers and students evaluate the attitude of responsibility that has been learned, namely level 3 (independence). This session is designed so that students can reflect and evaluate how independent they are in the soccer game.
	Cool-down	5 minutes	PNF	PNF
5-6	Warm-up	5 minutes	Jooging dan PNF	Jooging dan PNF Apperception
	Lesson	1 hour	**Discussion**: In this activity, students discuss the results of searching for basic passing	**Awareness talk:** In this activity, lecturers and students determine the level of responsibility they want to learn,

Weeks	Activities	Duration	PBL	TPSR
			techniques. **Presentation**: In this activity, students demonstrate the types of basic passing techniques they have learned. **Determining the problem:** In this activity, lecturers and students determine the problem with movement tasks that should be studied in today's meeting (the lecturer gives task to find types of exercises for basic passing techniques). **Experiment:** In this activity, students independently search several types of basic passing technique exercises from various sources such as: YouTube, books, journals. **Discussion:** In this activity, students discuss the results that they find about basic passing techniques. **Presentation:** In this activity, students demonstrate the types of basic passing technique.	namely level 4 (cooperation). **Lesson Focus:** In this activity, students learn level 4 (cooperation) through a soccer game. For example, students must cooperate in a soccer game. **Group Meeting:** In this activity, lecturers and students discuss level 4 (cooperation) that has been learned in a soccer game. **Reflection Time:** In this activity, lecturers and students evaluate the attitude of responsibility that has been learned, namely level 4 (cooperation). This session is designed so that students can reflect and evaluate how far they are able to cooperate in a soccer game.
	Cool-down	5 minutes	PNF	PNF

Statistical analysis

First, I carried out an analysis to find the mean ± standard deviation. Next, the normality (Shapiro-Wilk) and the reliability of the intraclass correlation coefficient (ICC) between the PBL and TPSR groups were tested. Then, the student paired sample t-test was conducted to test the differences in pretest and posttest to the groups on the variables of responsibility attitude and learning motivation. The effect size (ES) was calculated using Cohen's d: < 0.2 (trivial), 0.2-0.6 (small), 0.6-1.2 (moderate), 1.2-2.0 (large), > 2.0 (very large), and > 4.0 (extremely large) (Hopkins et al., 2009). Finally, the level of significance determined in this study was α 0.05, and all data analysis was tested using the Jamovi V. 2.3.28 statistical application.

RESULTS AND DISCUSSION

Table 3 presents the results of the ICC test with a value range of 0.887-0.978, and the results of the normality test between the PBL and TPSR groups on the variables of responsibility attitude and learning motivation are stated to be normally distributed (all, $p > 0.05$).

Table 3. Results of ICC and SW Tests between PBL and TPSR

Variables measured	ICC	SW- PBL (pre - post)	SW-TPSR (pre - post)
Responsible Attitudes			
Personal (score)	0.887	0.055	0.442
Sosial (score)	0.922	0.144	0.214
Learning Motivation			
Intrinsic motivation (score)	0.971	0.629	0.731
Identified regulation (score)	0.960	0.191	0.382
Introjected regulation (score)	0.944	0.206	0.132
External regulation (score)	0.951	0.231	0.185
Amotivation (score)	0.978	0.309	0.063

Note: ICC = Intraclass correlation coefficient; SW = Shapiro-wilk; PBL = Problem based learning; TPSR = Teaching personal social responsibility.

The effect of PBL and TPSR on responsible attitudes

Based on the Students Paired sample t-test, we found that the PBL model group had a significant effect on increasing personal responsible attitudes ($p < .001$; ES = -2.25) and social ($p < .001$; ES = -3.07). While the effects caused by the TPSR group on personal responsible attitudes ($p < .001$; ES = -4.27) and social ($p < .001$; ES = -4.09) (see Table 4). The detailed information regarding the increased value in the mean between PBL and TPSR is presented in Figure 3.

Table 4. Differences in Responsibility Attitudes between PBL and TPSR

Variables measured	Groups Model	n	Pre	Post	t	p	ES [*d*]
Responsible attitudes							
Personal (score)	PBL	15	21.8 ± 1.47	29.1 ± 3.09	-8.70	< .001*	-2.25 [very large]
	TPSR	15	21.1 ± 1.19	31.8 ± 2.54	-16.5	< .001*	-4.27 [dextremely large]
Sosial (score)	PBL	15	20.7 ± 1.71	30.1 ± 2.10	-11.9	< .001*	-3.07 [very large]
	TPSR	15	20.3 ± 1.54	31.7 ± 2.26	-15.9	< .001*	-4.09 [dextremely large]

Note: PBL = Problem based learning; TPSR = Teaching personal social responsibility; ES = Effect size. * Significant differences pretest and posttest.

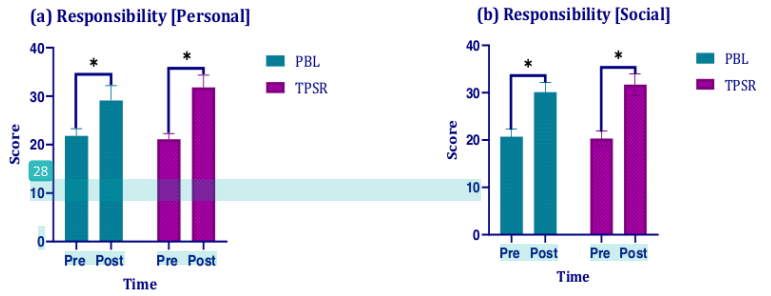

Figure 3. Mean ± SD (A) [Personal] Responsibility, (B) [Social] Responsibility between PBL and TPSR. *Significant Difference between Pretest and Posttest.

The Effects of PBL and TPSR and Learning Motivation

We observed that the PBL group had a positive effect on increasing learning motivation related to intrinsic motivation ($p < .001$; ES = -2.48), identified regulation ($p < .001$; ES = -3.25), introjected regulation ($p < .001$; ES = -3.07), external regulation ($p < .001$; ES = -2.44), and amotivation ($p < .001$; ES = -2.12). Meanwhile, at the same time, there was an increase produced by the TPSR group in intrinsic motivation ($p < .001$; ES = -4.13), identified regulation ($p < .001$; ES = -3.82), introjected regulation ($p < .001$; ES = -3.64), external regulation ($p < .001$; ES = -4.24), and amotivation ($p < .001$; ES = 2.87) (see Table 5). The differences in means and SD between the two groups are presented in Figure 4.

Table 5. Differences in Learning Motivation between PBL and TPSR

Variables measured	Groups	n	Pre	Post	t	p	ES [*d*]
Learning Motivation							
Intrinsic motivation (score)	PBL	15	12.1 ± 1.16	17.3 ± 1.84	-9.62	< .001*	-2.48 [very large]
	TPSR	15	11.3 ± 0.961	18.3 ± 1.113	-16.0	< .001*	-4.13 [dextremely large]
Identified regulation (score)	PBL	15	9.73 ± 1.22	16.33 ± 1.50	-12.6	< .001*	-3.25 [very large]
	TPSR	15	9.60 ± 1.06	17.40 ± 1.59	-14.8	< .001*	-3.82 [very large]
Introjected regulation (score)	PBL	15	9.00 ± 1.13	16.13 ± 1.88	-11.9	< .001*	-3.07 [very large]
	TPSR	15	9.00 ± 1.13	17.07 ± 1.58	-14.1	< .001*	-3.64 [very large]
External regulation (score)	PBL	15	8.93 ± 1.49	15.73 ± 1.75	-9.46	< .001*	-2.44 [very large]
	TPSR	15	8.27 ± 1.39	16.47 ± 1.13	-16.4	< .001*	-4.24 [dextremely large]
Amotivation (score)	PBL	15	15.3 ± 1.79	10.1 ± 1.25	-8.23	< .001*	-2.12 [very large]
	TPSR	15	16.33 ± 2.69	9.00 ± 1.36	11.1	< .001*	2.87 [very large]

Note: PBL = Problem based learning; TPSR = Teaching personal social responsibility; ES = Effect size.
*Significant difference between pretest and posttest.

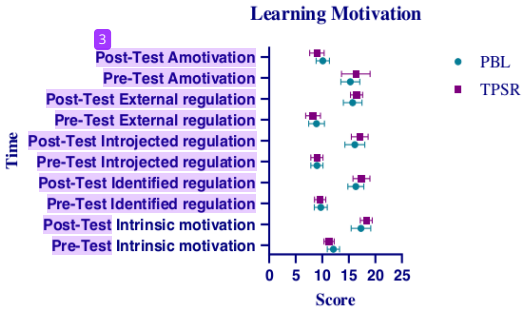

Figure 4. The Differences in Means ± SD between the Two Groups [PBL and TPSR]

This study aims to investigate the effects of PBL and TPSR on improving students' attitudes of responsibility and learning motivation. The first finding in this study showed that PBL and TPSR were proven to have a positive effect in improving the responsible attitude. However, if we observed more detail, a higher increase occurred in the TPSR

group than in PBL. The second finding in this study showed that PBL and TPSR also had a positive effect on improving the aspect of learning motivation, but a higher increase was found in the TPSR group compared to PBL.

The difference results of responsible attitudes and learning motivation between the PBL and TPSR groups, may be due to differences in the characteristics and stages of learning from the two learning models. The PBL model promotes learning by challenging students with problems (Raman et al., 2024; Rahmadi et al., 2023), and encourage them to solve it independently (Ghani et al., 2021; Muerza et al., 2024). This learning stages indirectly educate students to be more motivated and responsible for the tasks (problems) given by the lecturer. In addition, in PBL students were taught an independent attitude and must work together to complete learning assignments. This has also been proven by previous studies, PBL has the potential to increase responsibility (Kanyesigye et al., 2022), and motivation aspects (Wijnia et al., 2024). Other studies reported similar results, the application of the PBL model in PE showed a positive increase in the affective domain (Endrawan & Aliriad, 2023). On the other hand, Sutika et al. (2023), stated that the continuous implementation of the PBL model affected several aspects of character. Meanwhile, Luo (2019), in his research reported that the PBL model integrated into long-term PE showed a significant influence on increasing learning motivation among students.

Meanwhile the TPSR model promotes learning that focuses on improving each level (e.g., respect, participation/self-motivation, independence, caring/cooperation) in responsibility (Aygun et al., 2024; Carreres-Ponsoda et al., 2021; Hsu et al., 2022), so this model shows better improvement than PBL. However, we observed that the TPSR model was also able to improve low student learning motivation. The results of this study are in line with previous studies that reported the TPSR model was able to improve the quality of responsibility and learning motivation of 35 students in Spain (Merino-Barrero et al., 2019). Research conducted by Manzano-Sánchez and Gómez-López (2023), involved 216 students to take part in PE learning with the TPSR model, the results of their study showed that responsibility and motivation increased significantly. In addition, Manzano-Sánchez et al. (2019), found that the TPSR model integrated into the physical programme of the PE curriculum was useful to increase the need for responsibility and motivation among students. The main strengths of this study are as follows: creating a PBL and TPSR model programme that accommodates lecturers in PE learning to improve responsible and motivational aspects at the university level (ii) as the first study that finds out differences in the effects of PBL and TPSR to improve students' responsibility and motivation at the university level. However, this study still has several limitations; for example, the participants involved only came from one physical education department at one university in Indonesia, so there is a need for further research in the future to involve several participants from other physical education departments in Indonesia. In addition, the next suggestion is that the PBL and TPSR models can be applied in PE learning programs for other levels, for example, elementary, middle, or high school.

CONCLUSION

Based on the results, it can be concluded that both PBL and TPSR have proven to have positive effects in improving responsible attitudes and learning motivation, but responsibility and learning motivation are higher in students in the TPSR group than in PBL. This research contributes to the development of PE learning models at the university level as an effort to improve the quality of responsibility attitudes and learning motivation. In addition, practically, this research will be a reference for teachers or

lecturers so that they are willing to understand and integrate into the PE curriculum continuously in the future.

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