

# Teacher Perceptions of Teaching Students' Thinking Skills and Their Skills in Constructing a HOTS Lesson Plan

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## ABSTRACT

This research used a correlational design to describe and test the linear relationship between teachers' perceptions of teaching students' thinking skills and their skills when constructing HOTS lesson plans. The participants were 27 PE teachers undergoing in-service training in the Teacher Professional Education Program. Data on teacher perception variables about teaching thinking skills were collected using the Teachers' Classroom Practices for Teaching Thinking Scale developed by Dilekli & Tezci (2019). Meanwhile, the researcher collected HOTS lesson plan variable data from teacher documentation data, which was then assessed using the HOTS instrument and rubric developed by Suwarma & Apriyani (2022). The two variable data were analyzed descriptively and tested for correlation (Pearson) using the SPSS application. As a result, there is a significant linear correlation between the two research variables. The higher the teacher's perception of teaching students' thinking skills, the better the teacher integrates HOTS into his lesson plan (effective contribution of 15.6%). Schools and the government need to upgrade teachers with information as well as conceptual, procedural and metacognitive experience regarding effective learning, mastery and loyalty to the implementation of the Independent Curriculum so that teachers have the initiative and capacity to design lesson plans based on 21<sup>st</sup>-century skills credibly and sustainably.

**Keywords:** Teaching thinking skills, teaching HOTS, HOTS-based physical education, HOTS lesson plan, HOTS lesson study

## INTRODUCTION

Public attention has highlighted the study of higher order thinking skills (HOTS) because it has been considered an important determinant of contemporary educational outcomes (Lee & Chae, 2021). HOTS is even believed to be one of the skills students need to face the challenges of the 21<sup>st</sup>-century (Hamzah & Wan Yusoff, 2021; Nofrion & Wijayanto, 2018) because it can help students achieve the development of their full potential (Wilson & A/I Narasuman, 2020). Students with HOTS can respond to changes and demands effectively without spending many resource incentives through the thinking processes of analysing, evaluating, and creating (Anderson et al., 2001), critical thinking, and problem-solving (Mitani, 2021). Considering the importance of HOTS, Haryati et al. (2021) underline that professional teachers need to facilitate students in developing these abilities. In short, HOTS is a vital competency attribute in developing a person's life skills (Heffington & Coady, 2023; Sarah et al., 2022).

Teachers need to formulate the direction of critical thinking towards their students' development (including teaching thinking skills) into a lesson plan. Lesson plans are HOTS promotional media that impact student learning processes and outcomes (Ma'muroh et al., 2021). The problem, recorded in research cases, is that PE teachers sometimes need to use lesson plans (Haris & Ghazali, 2016), which results in

students' HOTS integration in learning needing to be more comprehensive and synergistic with educational goals. Apart from that, studies on preparing lesson plans in PE are very limited, one of which was diagnosed in the research of Prastyo & Muhammad (2015). Even though the research results are good (30.24), unfortunately, the lesson plan is not HOTS-based. Meanwhile, other research generalizes that PE teachers are not yet competent in preparing HOTS lesson plans (Cayoto et al., 2022), so the implementation of HOTS in PE is not optimal (Festiawan & Khurrohman, 2021; Suhadi et al., 2023). These problems indicate that PE teachers do not yet

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understand and are serious about preparing student learning devices that accommodate HOTS-based activities.

Responding to the problem of formulating HOTS lessons above, it is vital to investigate the variables that influence teachers in preparing HOTS lesson plans. Research that discusses the contribution of PE teachers' perceptions of teaching students' thinking skills with their skills in preparing HOTS lesson plans is challenging to find. Only a few similar studies on these subjects have been recorded. For example, investigating teacher perceptions and readiness as predictors of the application of critical thinking skills in mathematics learning (Ismail et al., 2019), biology teachers' skills in preparing HOTS lesson plans (Ramdiah et al., 2019) and skills in preparing STEM lesson plans (Altan & Ucuncuoglu, 2019; Sias et al., 2017). These data are concerning because PE can actually contribute to teaching students' HOTS through focus and information gathering (Ennis, 1991), game-based activities (Nopembri et al., 2022), as well as through peer observation and self-assessment activities (Bayu et al., 2022). HOTS-based PE can improve students' skills, fitness and knowledge (Schwager & Labate, 1993).

PE is responsible for realizing Indonesia's educational goals through developing students' physical activity (Blegur et al., 2023). In fact, PE teachers do not optimize this opportunity; instead, they often focus on "getting in" with the physical rather than integrating students' HOTS learning experiences "through" physical activities. These conditions indicate that PE teachers are still guided by traditional value orientation, namely movement (66.3%), followed by fitness (52.1%). Even though these two value orientations are the most traditional (Suherman, 2007, 2010), they have been abandoned by prospective teachers and PE teachers in Europe (Behets, 2001; Capel, 2016; Sisman & Ok, 2012). If we look closely at the previous discussion, the teacher's perception of teaching PE determines his orientation in formulating students' learning experiences. Are teachers only limited to formulating mastery of motor skills alone, or do they also need to formulate other skills that students need so that PE can equip students with a set of skills that help them survive in real life?

Until now, the results of previous studies only question the formulation of HOTS (Suhadi et al., 2022, 2023), the implementation of HOTS (Cayoto et al., 2022; Festiawan & Khurrohman, 2021; Solissa et al., 2023; Williyanto et al., 2022), and HOTS development (Nopembri et al., 2022). It means that no research has investigated the variables that underlie teachers' understanding in formulating, implementing and improving HOTS-based PE as an effort to support the implementation of quality PE for students in the 21<sup>st</sup>-century. Finally, this research aims to describe and correlate teachers'

perceptions of teaching students' thinking skills with their skills in constructing HOTS lesson plans in PE.

## METHOD

### Research Design and Procedure

This research used a correlational design. According to Curtis et al. (2016), correlational research is used to determine prevalence and relationships between variables and to predict events, so this research tests the significance of the linear relationship between teacher perception variables teaching thinking skills with the skill variable constructing HOTS lesson plans. The researchers first provided both research instruments to measure teacher perceptions about teaching thinking skills and assess HOTS lesson plans. After that, the Teachers' Classroom Practices for Teaching Thinking Scale was distributed using a Google form to participants so that they responded to 21 statements. At the same time, the researcher collected the lesson plan documents that the participants had prepared to assess HOTS indicators, both in the formulation of goals and objectives, the use of activities and media, as well as determining the assessment using the rubric developed by Suwarma & Apriyani (2022). The two research variable data were tabulated in an Excel document and then analyzed descriptively using the Pearson correlational.

### Participants

The participants involved were 27 PE teachers attending in-service training at the Teacher Professional Education Program, Universitas Pattimura, Ambon, Maluku, Indonesia (see Table 1). Participants were determined using a purposive sampling technique, where they were willing to voluntarily and actively participate during the research process.

**Table 1:** Demografi partisipan

<i>Demographic aspects</i>		<i>Description</i>	
<i>f</i>		<i>%</i>	
Gender	Male	23	85.2
	Female	4	14.8
Age	25-29	2	7.4
	30-34	8	29.6
	35-39	11	40.7
	40-44	6	22.2
Employment status	Civil servant	21	77.8
	Non-civil servant	6	22.2
Level of education	Senior high school	1	3.7
	Bachelor	26	96.3
The assignment period	0-4 years	3	11.1
	5-9 years	11	40.7
	10-14 years	9	33.3
	15-19 years	4	14.8

Demographic aspects <i>f</i>	Description	
		%
Assignment level	Elementary	4 14.8
	Junior high school	7 25.9
	Senior high school	16 59.3

### Instrument

Data on teachers' thoughts/perceptions about teaching thinking skills were collected using the Teachers' Classroom Practices for Teaching Thinking Scale developed by Dilekli & Tezci (2015) using the original Turkish language with an alpha coefficient of 0.84. Four years later, Dilekli & Tezci (2019) again adapted the Teachers' Classroom Practices for Teaching Thinking Scale into English with an alpha coefficient of 0.90. This instrument was developed using four indicators spread into 21 positive statements, namely Effectiveness of teaching thinking (1-9), Loyalty to curriculum (10-14), Teacher dependence (15-18), and Encouraging thinking (19-21). Participants were allowed to express their subjective feelings or views on a five-point Likert scale (always-never). Assessment of HOTS lesson plan construction products adopts instruments and rubrics developed by Suwarma & Apriyani, (2022). These instruments and rubrics used five HOTS lesson plan indicators, including 1) Goal, 2) Objectives, 3) Activities, 4) Media, and 5) Assessment. Each indicator was given a value response, including advanced (3), intermediate (2), or emerging (1).

### Data Analysis

Research data were collected from questionnaires and HOTS lesson plan products were analyzed descriptively using the Pearson test. Descriptive analysis was used to find the value of frequency, percentage, mean, and standard deviation of the two research variables. Furthermore, to fulfill the Pearson test assumption test, the research data passed the normality and linearity tests. The Pearson test concluded that if the significance value is less than 0.05, there is a correlation between teachers' perceptions of teaching thinking skills and their skills in constructing HOTS lesson plans, and vice versa.

### FINDINGS

The descriptive analysis shows the distribution of participants' responses to the teacher's perception variable questionnaire about teaching thinking skills. In detail, of the five scale answers, the highest score is in the Often (273), Always (130), Sometimes (111), and Rarely (37) options, and the lowest is in the Never (16) option. Whereas if it is based on indicators, the mean score of Effectiveness of teaching thinking is  $3.5 \pm 0.9$ , Loyalty to curriculum is  $4.2 \pm 0.8$ , Teacher dependence is  $4.3 \pm 0.8$ , and Encouraging thinking is  $3.5 \pm 1.1$ . The teacher's perception variable score about teaching thinking skills is not <63 and <98 (Table 2).

**Table 2:** Description of teacher perceptions about teaching thinking skills

No	Statement	Frequency					M±SD
		Nev	Rar	Som	Oft	Alw	
1	I arrange activities for students to make them find what real problem or problems of a story or an event are.	0	1	8	16	2	3.7±0.7
2	I get tables created as similarities and differences for two different events even if it takes time.	0	5	13	9	0	3.2±0.7
3	I want students to classify same notions or objects according to different criteria. (e.g., classifying same shapes according to their vertices, colours or sizes).	0	2	8	15	2	3.6±0.7
4	I prefer issues which are current and discussed in society as topics of composition.	1	4	5	14	3	3.5±1.0
5	I give home works to students which make them prepare speeches/presentations for the purpose of convincing another person.	3	2	14	7	1	3.0±1.0
6	I give home works to students which make them prepare speeches/presentations for the purpose of convincing another person.	0	0	0	15	12	4.4±0.5
7	I perform studies for making the whole event to be comprehended rather than details such as meronymies.	2	0	12	11	2	3.4±0.9
8	I want to students to analyze the given solution of a problem from a critical viewpoint.	1	1	5	16	4	3.8±0.9
9	I arrange activities to encourage to use some objects in unusual ways.	3	1	11	12	0	3.2±1.0

No	Statement	Frequency					M±SD
		Nev	Rar	Som	Oft	Alw	
10	Reaching general aims of the curriculum is my main object.	0	1	3	10	13	4.3±0.8
11	As a teacher, to be more systematic, primarily I prefer abiding by the course books.	0	1	4	15	7	4.0±0.8
12	Completing the curriculum in education period is the most important thing to me.	0	1	3	12	11	4.2±0.8
13	Abiding by educational attainments during lesson is my primary priority.	0	0	1	16	10	4.3±0.6
14	Because knowledge is the most important point for me, during the classroom activities I mainly care attainments of knowledge.	0	2	4	15	6	3.9±0.8
15	I give students most of the necessary information myself, during the class.	1	1	1	12	12	4.2±1.0
16	During classroom activities, I firstly explain the results of an event or a phenomenon.	0	0	2	17	8	4.2±0.6
17	When I give research homework, I remark trustworthy sources and want students to use them.	0	4	1	12	10	4.0±1.0
18	I answer the questions of students accurately and clearly.	0	0	0	9	18	4.7±0.5
19	I want students to make predictions even though they have no idea/assumptions.	1	3	9	14	0	3.3±0.8
20	Even if they are not true, I mind/allow expressing different ideas.	4	7	5	10	1	2.9±1.2
21	Having performed a study, I give activities to students including wh-questions.	0	1	2	16	8	4.2±0.7

Furthermore, the descriptive analysis of the teacher's skill variable in constructing the HOTS lesson plan shows the highest scores for the distribution of assessment results, namely Goals (59), 2) Objectives (55), Activities (63), Media (72), and Assessment (58), so that the highest score is on the Media indicator because the teacher optimizes using visual-auditory technology such as pictures, videos, and others to support students' HOTS development concepts. Whereas when using the mean score, the highest scores are in the Media indicator (2.7±0.5), Activities (2.3±0.7), Goals (2.2±0.7), Assessment (2.1±0.7), and finally, Objectives (2.0±0.6). The teacher's skill variable score in constructing the HOTS lesson plan is 6-15 (Table 3).

Normality and linearity tests are carried out to fulfill the Pearson correlation test requirements. The results of the Shapiro-Wilk normality test proved that both data were normally distributed (<0.05); namely, the significance of the teacher's perception variable teaching students' thinking skills was 0.851, and the HOTS lesson plan constructing skills variable was 0.296. Meanwhile, the linearity test results also prove a relationship between the two variables because the significance deviation from the linearity value is more significant than 0.05 (0.655<0.05).

The Pearson tester proved a significant linear correlation between the two research variables, where the significant

**Table 3:** Description of the teacher's skills in constructing a HOTS lesson plan

No	Indicator	Frequency			M±SD
		Em	Int	Adv	
1	Goal (the verb that write in goals consist of HOTS keyword such as analysing, evaluate; and creating)	5	12	10	2.2±0.7
2	Objectives (all 'Audience, Behavior, Condition and Degree' aspect wrote in Objectives, and 'Behavior' aspect show HOTS keywords)	4	18	5	2.0±0.6
3	Activities (the teacher stimulates a lot of questions to encourage students' original thoughts, such as question to identify, analyse, clarify, create ideas and solution, and develop argumentation)	3	12	12	2.3±0.7
4	Media (media represent concept)	0	9	18	2.7±0.5
5	Assessment (the problems consider HOTS key word such as analysing; evaluate; and creating).	5	13	9	2.1±0.7

**Table 4:** Pearson analysis

Teaches students thinking skills	Skills in constructing HOTS lesson plans					
	Goal	Object.	Activities	Media	Assess.	Total
Effectiveness of teaching thinking	-0.003	0.079	0.403*	0.398*	0.209	0.278
Loyalty to curriculum	0.233*	0.225	0.374	0.339	0.315	0.402*
Teacher dependence	0.007	0.066	0.360	0.320	0.421*	0.316
Encouraging thinking	-0.152	-0.054	0.226	0.208	0.145	0.091
Total	0.048*	0.128	0.496**	0.462*	0.362	0.395*

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

value was less than 0.05 (0.042). Therefore, the higher the teacher's perception of teaching students' thinking skills, the better the teacher's skills in constructing HOTS-based PE lesson plans (Table 4).

To find the coefficient of determination of the variable (R Square), the Model Summary and Parameter Estimates curve (see Figure 1) shows three models (Linear, Quadratic, and S) in analyzing data. As a result, the Linear model provides an effective contribution of 15.6% (F = 4.614; Sig. 0.042), using the Quadratic model provides an effective contribution of 16.1% (F = 2.295; Sig. 0.122), and the S model provides an effective contribution of 12.2% (F = 3.463; Sig. 0.075) (Figure 5).

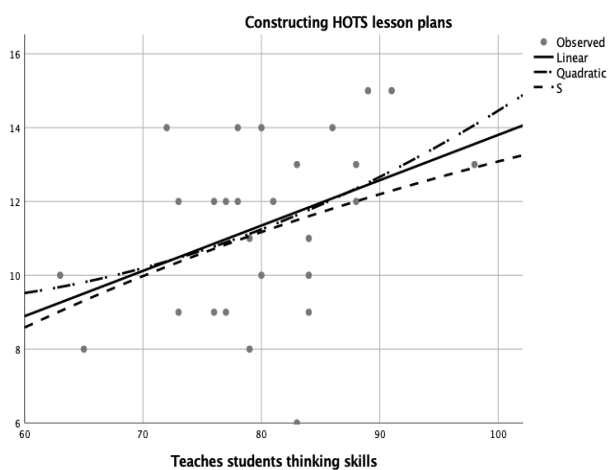
## DISCUSSION

This research found that teachers have the perception of teaching students good thinking skills and their skills in preparing HOTS lesson plans. However, teachers need to improve the "Effectiveness of teaching thinking" and "Encouraging thinking" indicators. Meanwhile, for skills in preparing lesson plans, teachers need ongoing assistance

in formulating HOTS-based "Objective" and "Assessment" indicators. Hypothesis testing also proves a significant positive correlation between the two research variables ( $r = 0.395$ ; Sig. = 0.042), with the effective contribution of teachers' perceptions of teaching students' thinking skills to HOTS lesson plan construction skills of 15.6%.

If the research results are reported based on indicators of skills in teaching thinking skills, then the Loyalty to curriculum indicator has the strongest correlation with PE teachers' skills in preparing HOTS lesson plans ( $r = 0.402$ ), followed by the Teacher dependence indicator ( $r = 0.316$ ), the Effectiveness of teaching indicator thinking ( $r = 0.278$ ), and finally the Encouraging thinking indicator ( $r = 0.091$ ) (see Table 4). It means that the teacher's orientation in teaching students' thinking skills in preparing lesson plans is determined by the mandate of the national education curriculum (including the implementation of HOTS-based learning). For example, the item "Reaching general aims of the curriculum is my main object," and the item "Abiding by educational attainments during lessons is my primary priority" got an average teacher response of 4.3. At least the two items above can profile readers regarding how teachers provide a high focus on achieving curriculum goals. Thus, this study confirms the findings of Chen et al. (2017), who previously stated that the impact of teacher value orientation may be mediated by the impact of the curriculum so that a well-designed PE curriculum can direct teachers to focus value orientation following national curriculum mandates (for example integrating HOTS-based learning).

The Pearson intercorrelation results also confirm that the Effectiveness of teaching thinking indicator correlates most strongly with the Activities indicator ( $r = 0.403$ ) and the Media indicator ( $r = 0.398$ ). The Loyalty to curriculum indicator strongly correlates with the Goal ( $r = 0.233$ ) and Objectives indicators ( $r = 0.225$ ). The Teacher dependence indicator is strongly associated with the Assessment indicator ( $r = 0.421$ ). Meanwhile, the Encouraging thinking indicator is the weakest contribution to the five indicators for preparing



**Fig. 1:** Summary model curves and parameter estimates

the HOTS lesson plan. Thus, for the government that wants to improve teachers' abilities in preparing HOTS lesson plans, it is necessary to strengthen teachers' capacity to understand the Independent Curriculum's objectives so that they can formulate HOTS goals and objectives correctly. Increase teachers' understanding and skills about various current learning models so that they are able to develop activities and use HOTS-based learning media. Lastly, they are increasing teachers' knowledge and skills about teacher dependence to implement credible HOTS assessments.

This research provides the latest views on the development of science in PE regarding the factors that motivate teachers when preparing HOTS lesson plans. Previous research discusses teachers' perceptions of teacher readiness or unpreparedness in implementing HOTS (Altan & Ucuncuoglu, 2019; Festiawan & Khurrohman, 2021; Ismail et al., 2019; Ramdiah et al., 2019; Sias et al., 2017). The development of teachers' professional competence is not limited to their teaching skills (Padillo et al., 2021), but includes how teachers formulate quality and adapted lesson plans to 21<sup>st</sup>-century skills (HOTS) (Astutik & Roesminingsih, 2021; Faridah et al., 2021; Haryati et al., 2021). When teachers construct HOTS lesson plans, they need information, knowledge, and skills about HOTS itself (Hashim et al., 2022) so that they can be easily internalized when formulating Goals, Objectives, Activities, Media, and Assessment, for example, planning for students to find problems from data or demonstrations, presenting data or information and then asking students to look for similarities and differences, or facilitating students to classify the same object with different criteria.

HOTS is one of the segments highlighted in producing quality human capital (Misrom et al., 2020), such as decision-making (Pacheco-Montoya & Murphy-Graham, 2022). Blegur et al., (2021) once reported that individuals with HOTS attributes are more selective in managing information and independent in developing learning strategies to achieve goals. The current flow of information tends to overlap and be uncontrolled, so students need analytical and critical thinking to decide their future, and teachers are responsible for facilitating the demands of these students' needs. Teachers must encourage student involvement in the experience of analyzing the solution to a problem from a critical perspective and stimulate students to use objects in unusual ways. These "unusual" views help teachers project their HOTS lessons. It means that to construct a HOTS lesson plan, teachers must have a comprehensive perspective on teaching HOTS to their students during class.

Research on preparing teacher lesson plans has received less attention in measuring relevant competencies (König et al., 2021), so some teachers have not optimally integrated

HOTS into their learning (Hemas et al., 2021; Suwarma & Apriyani, 2022). The proof is that if the reader traces the research topic regarding the development of HOTS PE lesson plans in Indonesia, it is still limited to the study of Cayoto et al. (2022). Generally, research only reports analysis of the preparation, implementation, and improvement of students' HOTS in PE (Bayu et al., 2022; Dewanti et al., 2021; Festiawan & Khurrohman, 2021; Nopembri et al., 2022; Suhadi et al., 2022, 2023; Waffak et al., 2022). It means that they only question the values, implementation, and improvement of HOTS-based learning but ignore what is behind teachers integrating HOTS in formulating their lesson plans. Then the question is, how can HOTS activities be internalized and even increased if the teacher's perception of HOTS itself is not yet comprehensive?

In other subjects, there are several differences in teacher perceptions when implementing HOTS. For example, teachers are of the view that HOTS only applies to gifted students (Tanudjaya & Doorman, 2020), students have limited basic knowledge, different approaches and access to material, and limited curriculum development and time for developing HOTS for students (Acharya, 2021). It was even found that teachers explained their limitations due to the preparation of very detailed lesson plans (Capel et al., 2019). These constraints imply that teachers' knowledge in preparing HOTS lesson plans must be more comprehensive, from conceptual to methodological, to accommodate students' various basic potential backgrounds with a more operational, participatory, and holistic HOTS learning model. In Indonesia, HOTS has become a government recommendation in the Independent Curriculum, so teachers must follow it in formulating and implementing their learning.

Mastery of subject discipline is crucial for a PE teacher (Mesias, 2022), so teachers' knowledge of the HOTS concept and how to apply strategies is important when they prepare their lesson plans. At least teachers know the verbs for preparing HOTS, formulating HOTS-based learning behavior, ensuring the implementation of learning models that accommodate HOTS characteristics, and optimizing credible media and instruments in assessing student HOTS. Several practical models have been developed to improve teachers' skills in formulating HOTS lesson plans. For example, the CODE-PLAN ("co" cognitive" de" mands of lesson "planning" model) (König et al., 2021), integrating the HOTS-Link mobile learning application (Susantini et al., 2022) or using research empirical from Derri et al. (2014). These three models have been proven to increase teacher competence in formulating HOTS lesson plans by setting appropriate instructional goals and targets in planning and evaluating student learning experiences. Apart from that,

according to Nofrion & Wijayanto (2018), teachers must also integrate more questions/activities/tasks/problems at a high cognitive level (analyzing, evaluating, and creating) in each lesson.

*The practical application of the results of this research teaches teachers to reflect on themselves to analyze conceptual weaknesses in implementing HOTS to improve the learning process (Aprilya & Saifuddin, 2021). Encouraging the HOTS learning experience is to reduce the "authority" of the teacher in the classroom as the primary learning source. Teachers must have the courage to provide opportunities for students to express various views in unusual ways. For example, allowing students to predict an idea/assumption, expressing opinions and/or demonstrations even though they are different from their peers and/or teachers, and convincing others of the ideas or demonstrations they have developed. These processes are not instantaneous for teachers because they are against general "routines," but Blegur et al. (2017) once underlined that as competent individuals, teachers are responsible for making effective and efficient learning approaches, methods and strategies with expertise, personality, and social relationships to explore participants' potential to survive in real life.*

## CONCLUSION

This study provides empirical evidence that teachers' perceptions of teaching students' thinking skills have a linear and significant correlation with their skills in preparing HOTS lesson plans. Schools and the government need to upgrade teachers with information and data. Also, factual, conceptual, procedural, and metacognitive experiences regarding the implementation of effective learning, mastering, and loyal to the implementation of the Independent Curriculum, having the initiative and capacity to motivate, moderate, clarify and evaluate students' learning experiences on an ongoing basis based on 21<sup>st</sup>-century skills. Finally, the most important thing is that the teacher prepares various "learning stages" so that students channel their potential and critical thoughts, even those that are different from the usual. This basic capital helps teachers promote HOTS-based student learning experiences when preparing their lesson plans while simultaneously stimulating quality student self-actualization experiences in PE.

## LIMITATION

Participants are teachers participating in the in-service training program, so their population is limited. They have received various intervention materials and skills about HOTS learning (concept and implementation) while participating in the training program. Further research needs to conduct a comparative study with regular teachers (non-in-service

training) to find similarities and differences between teachers' perceptions of fostering students' thinking skills and their skills in preparing HOTS lesson plans. Investigation of HOTS lesson plan preparation skills is also still essential for certified teachers, given that the Indonesian government pays them a certain amount of budget. Therefore, PE teachers must guarantee their commitment and consistency in preparing and implementing high-quality learning in support of Indonesia's national education goals agenda.

## SUGGESTIONS FOR FUTURE STUDIES

Further research prospects need to compare the perceptions and teaching practices of young teachers and senior teachers in preparing HOTS lesson plans, considering the many government programs to support the continuous development of teacher competence. Second, it is necessary to reveal differences in teachers' abilities in preparing HOTS lesson plans based on gender with the broader population. Third, follow up on the research results by examining strategies for teaching thinking skills in preparing lesson plans with teacher skills in teaching HOTS to students to look for conceptual and contextual consistency of HOTS orientation in PE. Fourth, adopt action research to test the effectiveness of implementing the HOTS lesson plan on the teaching performance of teachers and HOTS students. Finally, some development research is needed to innovate learning models that promote students' HOTS in PE, considering the characteristics of physical activity-based learning and how teachers can improvise students' HOTS-based learning experiences.

## REFERENCES

- Acharya, N. H. (2021). Mathematics teachers' perceptions on higher order thinking skills. *International Journal of Multidisciplinary Perspectives in Higher Education*, 6(2), 105–125. <https://doi.org/10.32674/jimphe.v6i2.3772>
- Altan, E. B., & Ucuncuoglu, I. (2019). Examining the development of pre-service science teachers' STEM-focused lesson planning skills. *Eurasian Journal of Educational Research*, 2019(83), 103–124. <https://doi.org/10.14689/ejer.2019.83.5>
- Anderson, L. W., Krathwohl, D. R., Airasian, P. W., Cruikshank, K. A., Mayer, R. E., Pintrich, P. R., Rath, J., & Wittrock, M. C. (2001). *A taxonomy for learning, teaching, and assessing: Revision of Bloom's taxonomy of educational objectives*. Addison Wesley Longman, Inc.
- Aprilya, I. R., & Saifuddin, M. (2021). Problems in HOTS application: A study of teacher's reflection and decision making. *Journal of English Teaching Adi Buana*, 6(2), 163–170. <https://doi.org/10.36456/jet.v6.n02.2021.4048>
- Astutik, K. F., & Roesminingsih, E. (2021). The Improvement of teachers' professional competency through Hots-Based Train-

- ing. *JPI (Jurnal Pendidikan Indonesia)*, 10(1), 145–151. <https://doi.org/10.23887/jpi-undiksha.v10i1.22407>
- Bayu, W. I., Nurhasan, Suroto, & Solahuddin, S. (2022). Peer observation, self-assessment, and circuit learning: Improving critical thinking and physical fitness in physical education. *Cakrawala Pendidikan*, 41(2), 308–320. <https://doi.org/10.21831/cp.v41i2.38654>
- Behets, D. (2001). Value orientations of physical education preservice and inservice teachers. *Journal of Teaching in Physical Education*, 20(2), 144–154. <https://doi.org/10.1123/jtpe.20.2.144>
- Blegur, J., Haq, A. H. B., & Barida, M. (2021). Goal-setting strategies of prospective physical education teachers to maintain academic performance. *AL-ISHLAH: Jurnal Pendidikan*, 13(1), 473–484. <https://doi.org/10.35445/alishlah.v13i1>
- Blegur, J., Rajagukguk, C. P. M., Sjoen, A. E., & Souisa, M. (2023). Innovation of analytical thinking skills instrument for throwing and catching game activity for elementary school students. *International Journal of Instruction*, 16(1), 723–740. <https://doi.org/10.29333/iji.2023.16140a>
- Blegur, J., Wasak, M. R. P., & Manu, L. (2017). Penilaian formatif peserta didik atas kompetensi pendidik dalam proses pembelajaran. *Satya Widya*, 33(2), 117–127. <https://doi.org/10.24246/j.sw.2017.v33.i2.p117-127>
- Capel, S. (2016). Value orientations of student physical education teachers learning to teach on school-based initial teacher education courses in England. *European Physical Education Review*, 22(2), 167–184. <https://doi.org/10.1177/1356336X15596984>
- Capel, S., Bassett, S., Lawrence, J., Newton, A., & Zwozdiak-Myers, P. (2019). How trainee physical education teachers in England write, use and evaluate lesson plans. *European Physical Education Review*, 25(4), 964–982. <https://doi.org/10.1177/1356336X18785053>
- Cayoto, Rumini, & Hanani, E. S. (2022). Learning physical education, sports and health in elementary schools based on higher order thinking skills during the Covid 19 pandemic. *Journal of Physical Education and Sports*, 11(2), 245–257. <https://doi.org/10.15294/JPES.V11I2.58937>
- Chen, A., Zhang, T., Wells, S. L., Schweighardt, R., & Ennis, C. D. (2017). Impact of teacher value orientations on student learning in physical education. *Journal of Teaching in Physical Education*, 36(2), 152–161. <https://doi.org/10.1123/jtpe.2016-0027>
- Curtis, E. A., Comiskey, C., & Dempsey, O. (2016). Importance and use of correlational research. *Nurse Researcher*, 23(6), 20–25. <https://doi.org/10.7748/nr.2016.e1382>
- Derri, V., Papamitrou, E., Vernadakis, N., Koufou, N., & Zetou, E. (2014). Early professional development of physical education teachers: Effects on lesson planning. *Procedia - Social and Behavioral Sciences*, 152, 778–783. <https://doi.org/10.1016/j.sbspro.2014.09.320>
- Dewanti, G., Yudanto, Y., Hartanto, A., Yacshie, B. T. P. W. B., & Arianto, A. C. (2021). Implementasi pembelajaran permainan bola besar berorientasi high order thinking skill (HOTS) di SMP Negeri se-Kota Yogyakarta. *Jurnal Pendidikan Jasmani Indonesia*, 17(2), 77–85. <https://doi.org/10.21831/jpji.v17i2.44991>
- Dilekli, Y., & Tezci, E. (2015). The study of validity and reliability of teachers' classroom practices for teaching thinking scale. *NWSA Academic Journals*, 10(4), 276–290. <https://doi.org/10.12739/NWSA.2015.10.4.1C0647>
- Dilekli, Y., & Tezci, E. (2019). Adaptation of teachers' teaching thinking practices scale into English. *European Journal of Educational Research*, 8(4), 943–953. <https://doi.org/10.12973/eu-jer.8.4.943>
- Ennis, C. D. (1991). Discrete thinking skills in two teachers' physical education classes. *The Elementary School Journal*, 91(5), 473–487. <https://doi.org/10.1086/461670>
- Faridah, I., Wahidin, & Gloria, R. Y. (2021). Teacher's competencies in designing lessons to improve students' learning outcomes. *Scientiae Educatia*, 10(1), 48–56. <https://doi.org/10.24235/sc.educatia.v10i1.7660>
- Festiawan, R., & Khurrohman, M. F. (2021). Implementation of higher order thinking skills in physical education learning in Covid-19 era: Is it work? *COMPETITOR: Jurnal Pendidikan Keperawatan Olahraga*, 13(2), 139–153. <https://doi.org/10.26858/cjpk.v13i2.20158>
- Hamzah, L. M., & Wan Yusoff, W. M. (2021). A scoping review on implementation of I-Think Maps and its effects on higher order thinking skills in Malaysian schools. *Asian Journal of University Education*, 17(2), 169–182. <https://doi.org/10.24191/ajue.v17i2.13386>
- Haris, A., & Ghazali, M. I. (2016). Teacher's makes lesson plan curriculum physical education at junior school in Makassar, Sulawesi Selatan Indonesia. *International Journal of Advanced Educational Research*, 1(4), 6–12. [www.educationjournal.org](http://www.educationjournal.org)
- Haryati, S., Trisnowati, E., Siswanto, & Al Firdaus, Moch. M. (2021). Identifying higher-order thinking skills on lesson plan: How do teachers construct the lesson plan? *Tadris: Jurnal Keguruan Dan Ilmu Tarbiyah*, 6(2), 277–285. <https://doi.org/10.24042/tadris.v6i2.8828>
- Hashim, S., Baharudin, N., Abdul Rahman, K. A., Hussin, I., Mohd Asri, K., & Zulkifli, N. N. (2022). Observation on teachers' readiness for implementation of higher order thinking skills (HOTS) in Technical and Vocational Education and Training (TVET). *Online Journal for TVET Practitioners*, 7(1), 31–40. <https://doi.org/10.30880/ojtp.2022.07.01.004>
- Heffington, D. V., & Coady, M. R. (2023). Teaching higher-order thinking skills to multilingual students in elementary classrooms. *Language and Education*, 37(3), 308–327. <https://doi.org/10.1080/09500782.2022.2113889>
- Hemas, M. D. A., Wedhanti, N. K., & Juniarta, P. A. K. (2021). Analysis of higher order thinking skills in English lesson plans. *Thinking Skills and Creativity Journal*, 4(2), 68–73. <https://doi.org/10.23887/tscj.v4i2.36999>
- Ismail, S. N., Muhammad, S., Kanesan, A. G., & Ali, R. Md. (2019). The influence of teachers' perception and readiness towards the implementation of critical thinking skills (CTS) practice in mathematics. *International Journal of Instruction*, 12(2), 337–352. <https://doi.org/10.29333/iji.2019.12222a>
- König, J., Krepf, M., Bremerich-Vos, A., & Buchholtz, C. (2021). Meeting cognitive demands of lesson planning: Introducing the



- CODE-PLAN Model to describe and analyze teachers' planning competence. *The Teacher Educator*, 56(4), 466–487. <https://doi.org/10.1080/08878730.2021.1938324>
- Lee, M.-S., & Chae, S. E. (2021). Development of the higher-order thinking skill scale for Korean University students (HOTUS). *Journal of College Student Development*, 62(4), 469–487. <https://doi.org/10.1353/csd.2021.0048>
- Ma'muroh, Rumini, & Soegiyanto. (2021). Implementation of one sheet learning plan in physics and health education study in SMP Sub Rayon 06 Semarang academic year 2020/2021. *Journal of Physical Education and Sports*, 10(2), 135–141. <https://doi.org/10.15294/JPES.V10I2.46423>
- Mesias, J. C. M. (2022). Out-of-field public senior high school teachers: Competencies in teaching physical education. *Physical Education and Sports: Studies and Research*, 1(2), 123–135. <https://doi.org/10.56003/pessr.v1i2.137>
- Misrom, N. S., Abdurrahman, M. S., Abdullah, A. H., Osman, S., Hamzah, M. H., & Fauzan, A. (2020). Enhancing students' higher-order thinking skills (HOTS) through an inductive reasoning strategy using geogebra. *International Journal of Emerging Technologies in Learning*, 15(3), 156–179. <https://doi.org/10.3991/ijet.v15i03.9839>
- Mitani, H. (2021). Test score gaps in higher order thinking skills: Exploring instructional practices to improve the skills and narrow the gaps. *AERA Open*, 7(1), 1–23. <https://doi.org/10.1177/23328584211016470>
- Nofrion, N., & Wijayanto, B. (2018). Learning activities in higher order thinking skill (HOTS) oriented learning context. *Geosfera Indonesia*, 3(2), 122–130. <https://doi.org/10.19184/geosi.v3i2.8126>
- Nopembri, S., Rismayanthi, C., Putro, K. H., Kristiyanto, A., Margo-no, A., Karakauki, M., & Pratama, K. W. (2022). Improvement of HOTS method in basketball game through TGFU learning. *Physical Education Theory and Methodology*, 22(1), 85–91. <https://doi.org/10.17309/tmfv.2022.1.12>
- Pacheco-Montoya, D., & Murphy-Graham, E. (2022). Fostering critical thinking as a life skill to prevent child marriage in Honduras: The case of Holistic Education for Youth (HEY!). In J. DeJaeghe-re & E. Murphy-Graham (Eds.), *Life skills education for youth. Young people and learning processes in school and everyday life* (pp. 215–243). Springer Nature. [https://doi.org/10.1007/978-3-030-85214-6\\_10](https://doi.org/10.1007/978-3-030-85214-6_10)
- Padillo, G. G., Manguilimotan, R. P., Capuno, R. G., & Espina, R. C. (2021). Professional development activities and teacher performance. *International Journal of Education and Practice*, 9(3), 497–506. <https://doi.org/10.18488/journal.61.2021.93.497.506>
- Prastyo, Z., & Muhammad, H. N. (2015). Analisis kemampuan guru dalam pembuatan RPP kurikulum 2013 dan pembelajaran pendidikan jasmani kesehatan dan olahraga (PJOK) se-Kecamatan Gununganyar Kota Surabaya. *Jurnal Pendidikan Olahraga dan Kesehatan*, 3(2), 492–500.
- Ramdiah, S., Abidinsyah, Royani, M., & Husamah. (2019). Understanding, planning, and implementation of HOTS by senior high school biology teachers in Banjarmasin-Indonesia. *International Journal of Instruction*, 12(1), 425–440. <https://doi.org/10.29333/iji.2019.12128a>
- Sarah, S., Aswita, D., Ainun, N., Maulidar, & Azzarkasyi, M. (2022). The development of HOTS-based assessment instruments on educational statistics. *International Journal of Trends in Mathematics Education Research*, 5(1), 38–43. <https://doi.org/10.33122/ijtmer.v5i1.107>
- Schwager, S., & Labate, C. (1993). Teaching for critical thinking in physical education. *Journal of Physical Education, Recreation & Dance*, 64(5), 24–26. <https://doi.org/10.1080/07303084.1993.10609970>
- Sias, C. M., Nadelson, L. S., Juth, S. M., & Seifert, A. L. (2017). The best laid plans: Educational innovation in elementary teacher generated integrated STEM lesson plans. *The Journal of Educational Research*, 110(3), 227–238. <https://doi.org/10.1080/00220671.2016.1253539>
- Sisman, G. T., & Ok, A. (2012). Value orientations of the teaching certificate program students. *Procedia - Social and Behavioral Sciences*, 46, 2130–2134. <https://doi.org/10.1016/j.sbspro.2012.05.441>
- Solissa, J., Tomaso, Y., Hukubun, M., & Hattu, M. (2023). Implementation of HOTS based (high order thinking skill) physical education learning to learning for physical education teacher In Masohi Central Maluku. *Kinestetik: Jurnal Ilmiah Pendidikan Jasmani*, 7(1), 12–20. <https://doi.org/10.33369/jk.v7i1.26177>
- Suhadi, Handoko, R. D., Mawarti, S., Santoso, N., Antoni, M. S., & Andriyani, F. D. (2023). Teachers' lesson plan in the implementation of HOTS oriented physical education learning. *Jurnal Keolah-ragaan*, 11(1), 131–139. <https://doi.org/10.21831/jk.v11i1.59655>
- Suhadi, Mawarti, S., Santoso, N., & Dwihandaka, R. (2022). Analysis of the learning implementation plan for the big ball game material oriented high order thinking skills (HOTS) in state junior high schools throughout the district Bantul. *Advances in Health Sciences Research*, 43, 23–26. <https://doi.org/10.2991/ahsr.k.220106.003>
- Suherman, A. (2007). *Realisasi kurikulum pendidikan jasmani sekolah dasar di Kota Bandung*. Universitas Pendidikan Indonesia.
- Suherman, A. (2010). Effects of school context variables on physical education teachers' value orientation. *Cakrawala Pendidikan*, 29(3), 311–324. <https://doi.org/10.21831/cp.v3i3.360>
- Susantini, E., Isnawati, & Raharjo. (2022). HOTS-Link mobile learning application: Enabling biology pre-service teachers to devise HOTS-Based Lesson Plans. *Journal of Science Education and Technology*, 31(6), 783–794. <https://doi.org/10.1007/s10956-022-09993-w>
- Suwarma, I. R., & Apriyani, S. (2022). Explore teachers' skills in developing lesson plan and assessment that oriented on higher order thinking skills (HOTS). *Journal of Innovation in Educational and Cultural Research*, 3(2), 106–113. <https://doi.org/10.46843/jiecr.v3i2.66>
- Tanudjaya, C. P., & Doorman, M. (2020). Examining higher order thinking in Indonesian lower secondary mathematics classrooms. *Journal on Mathematics Education*, 11(2), 277–300. <https://doi.org/10.22342/jme.11.2.11000.277-300>

- Waffak, M. N., Sukoco, P., Sugiyanto, F. X., Arifianti, E., Setiawan, J., & Daryono, R. W. (2022). Developing a basketball learning model using the teaching game for understanding (TGfU) approach to improve the effectiveness of HOTS in elementary schools. *Physical Education Theory and Methodology*, 22(3), 21–29. <https://doi.org/10.17309/tmfv.2022.3s.03>
- Williyanto, S., Nugraha, R., Urbalia, A., Hendrianto, R., Akprilianingsih, W., & Rusli, U. (2022). The effect of Hots-Based Blended Learning on students' critical thinking ability in physical education learning. *Journal of Physical Education*, 9(2), 45–50. <https://doi.org/10.15294/jpehs.v9i2.40103>
- Wilson, D. M., & A/I Narasuman, S. (2020). Investigating teachers' implementation and strategies on higher order thinking skills in school based assessment instruments. *Asian Journal of University Education*, 16(1), 70–84. <https://doi.org/10.24191/ajue.v16i1.8991>