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The Personalized System of E-Modul Instructions in Physical Education Online Learning
El sistema personalizado de instrucciones E-Modul en educación física en línea

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Abstract. The Covid-19 pandemic has disrupted the world of education which has made schools implement online learning. This situation is very challenging for Physical Education (PE) course. The study purpose was to examine the condition of physical education online learning and the needs of teachers for electronic modules based on personalized system of learning instruction models in PE online learning. Materials and methods This study used Research and Development (R&D) method with qualitative and quantitative setting using questionnaire as an instrument. 61 of 86 respondents responded and filled out the questionnaire completely between 7-14 October 2021. Results Three main findings were highlighted in this study. *Firstly,* the condition of PE online learning has not been effective during the Covid-19 pandemic. Teachers experienced several obstacles in implementing PE online learning. *Secondly,* teachers need e-modules as material for student learning independently at home. *Lastly,* it is necessary to apply a personalized system of instruction learning model in PE online learning. This model is believed to be appropriate and effective as an independent learning model. Conclusions PE online learning has not been effective so far. An electronic module based on a personalized system of instruction is needed to support the implementation of PE online learning.
Keywords: physical education, online learning, e-module, personalized system, instruction.

Resumen. La pandemia de Covid-19 ha trastocado el mundo de la educación y ha obligado a las escuelas a implementar el aprendizaje en línea. Esta situación es muy desafiante para el curso de Educación Física (EF). El propósito del estudio fue examinar la condición del aprendizaje en línea de educación física y las necesidades de los docentes de módulos electrónicos basados en sistemas personalizados de modelos de instrucción de aprendizaje en el aprendizaje en línea de educación física. Materiales y métodos Este estudio utilizó el método de Investigación y Desarrollo (I+D) con configuración cualitativa y cuantitativa utilizando el cuestionario como instrumento. 61 de 86 encuestados respondieron y completaron el cuestionario en su totalidad entre el 7 y el 14 de octubre de 2021. Resultados En este estudio se destacaron tres hallazgos principales. En primer lugar, la condición del aprendizaje en línea de educación física no ha sido eficaz durante la pandemia de Covid-19. Los docentes experimentaron varios obstáculos al implementar el aprendizaje de educación física en línea. En segundo lugar, los profesores necesitan módulos electrónicos como material para que los estudiantes aprendan de forma independiente en casa. Por último, es necesario aplicar un modelo de aprendizaje de sistema personalizado de instrucción en el aprendizaje de EF en línea. Se cree que este modelo es apropiado y eficaz como modelo de aprendizaje independiente. Conclusiones El aprendizaje de educación física en línea no ha sido efectivo hasta el momento. Se necesita un módulo electrónico basado en un sistema de instrucción personalizado para apoyar la implementación del aprendizaje de educación física en línea.
Palabras clave: educación física, aprendizaje en línea, módulo electrónico, sistema personalizado, instrucción.

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Introduction

Online learning has become a mode of learning interaction that has been used since the Covid-19 pandemic (Adedoyin & Soykan, 2020; Tejerina & Fernandez Rio, 2022; Nasrulloh et al., 2020). Educational institutions must quickly adapt to situations that occur for the continuity of the educational process (Sanz-Remacha et al., 2022; Teräs et al., 2020; Nugroho et al., 2021). The application of the distance education model is becoming increasingly urgent and important in the current situation of the COVID-19 pandemic (Yao et al., 2021; Sutapa et al., 2020; Nasrulloh et al., 2021). Face-to-face learning in schools that was carried out before the COVID-19 pandemic was replaced with distance learning as the government implemented a study from home policy (Listyarini et al., 2021; Kristiyanto et al., 2020; Nasrulloh et al., 2022). The transformation from face-to-face learning to virtual learning must be carried out as part of efforts to suppress the spread and transmission of COVID-19 in the educational environment (Castillo-Retamal et al., 2021; Yudhistira et al., 2021).

Online learning has become an important alternative in modern education. However, its implementation presents a major challenge: the access and resource gap. Countries that have high incomes are ready to offer distance education, while middle-income countries find barriers to enabling distance education (Pulido-Montes & Ancheta-Arrabal. Ana, 2021; Sukendro et al., 2021). This shows that abilities and capacities are uneven in terms of response and preparation for online learning among low-income countries as well as in middle and high-income countries (Lorente et al., 2020; Ilham et al., 2021).

Online learning poses a challenge for all teachers, including Physical Education (PE) subject teachers (Alfonso González-Rivas et al., 2021; Baena-Morales et al., 2021; Sutapa et al., 2021). Online learning is important for the sustainability of the PE program during the covid-19 pandemic and after (Webster et al., 2021; Saifu et al., 2021). PE has the characteristics of using physical activity in the learning process (Alvariñas-Villaverde & Pazos-González, 2020; Nopembri et al., 2022). This is a challenge for PE teachers to create effective and meaningful online learning while keeping students actively engaged. The condition of PE online learning still has various obstacles

related to the readiness of its human resources (educators, students, and parents of students) as well as the readiness of supporting facilities (technology and internet networks) (Hastuti et al., 2021; Hardianto et al., 2022).

The survey results of PE teachers' experiences in distance learning during the early phase of the COVID-19 pandemic in America provide an overview of the implementation of PE learning running with the teacher asking students to send assignments (51% yes), using video instructions (37% yes), less effective when instructing remotely (20% yes), and emphasize student learning outcomes focusing on health-related fitness (32% yes), and the value/enjoyment of physical activity (43% yes) (Mercier et al., 2021; Pratama et al., 2022).

Meanwhile, in South Korea, difficulties were found in PE online learning, including monotonous classes in limited environmental conditions and limited educational content that did not adequately convey the value of physical education, and trial-and-error methods applied nationally, caused by lack of expertise in operating online physical education classes (Jeong & So, 2020; Adji et al., 2022). Conditions are not much different also occur in Indonesia, obstacles in online learning of physical education are faced by teachers such as in terms of using learning media, determining attitudes in learning, increasing students' learning motivation, developing creativity during online learning, and the facilities and infrastructure used during learning online. The condition of PE learning during the COVID-19 pandemic shows that the online PE learning process is not yet ideal (Almonacid-Fierro et al., 2021; Jufrianis et al., 2021). It is feared that this will have an impact on the mastery of students' knowledge, attitudes, and skills. Practical learning in PE is not easy to teach or learn for educators and students online because the interaction between students and educators in online learning is lower than conventional offline learning, so it is difficult for students to be actively involved in learning (Yu & Jee, 2021; Yuniana et al., 2023).

Student learning outcomes are very dependent on the honesty of the students themselves in participating in learning and completing various tasks independently. PE online learning demands a positive attitude and readiness of students in online learning (Hergüner et al., 2021; Salafi et al., 2022). PE online learning requires the independence of students (Sato & Haegele, 2018; Utami et al., 2023). Therefore, it is necessary to apply learning models and learning media that can accommodate the needs of students in independent and structured learning. By using the right learning model, it is expected to be able to grow and improve the mastery of knowledge, attitudes, and skills of students. Related to the above issues, the focus of this research is to overcome the problems of PE online learning by offering a learning model that is able to accommodate the needs of students in independent and structured learning. One of the learning models that can accommodate the needs of these students is the Personalized System of Instruction (PSI) learning model. PSI Learning Model is a learning model that focuses more on the learning process that is independent and able to shape students into independent learners (Juditya et al., 2019; Kogoya et al., 2023). The PSI learning model allows students to become independent learners and at the same time allows teachers to use a high level of interaction with students who need it (Metzler, 2011; Nugroho et al., 2022).

A number of studies report the benefits of implementing the PSI learning model in PE learning at the higher and secondary levels of education.Among them is that the use of electronic modules based on the PSI learning model is able to influence the mastery of students' basic movements in basketball games (Agusni et al., 2018; Trisnadi et al., 2023); there is an effect of applying the PSI learning model to increasing knowledge of Health-Related Fitness (Prewitt et al., 2015; Amran et al., 2023; Riyana et al., 2023);there is an effect of PSI on the physical fitness of students (Friskawati et al., 2017; Kauki et al., 2024); and there is an increase in motivation in PE learning by using the PSI learning model (Ginanjar, 2019; Trisnadi et al., 2024). Based on some of these research results, it can be understood that the PSI learning model has advantages in improving the following aspects: (1) skills; (2) knowledge; (3) fitness, and (4) students' learning motivation.

Many researchers have studied this topic, but there is another side that needs to be explored further, namely the PSI learning model is applied in online learning using electronic module media (e-modules). To be able to make students learn independently, it is necessary to provide a learning media that supports the learning process by applying the PSI model, the media that can be applied in the PSI learning model is the e-module. E-modules based on the PSI learning model can be interpreted as module teaching materials that are presented using electronic media. With the use of these e-modules, students can master the materials in PE lessons. The e-module is equipped with instructions for independent study so that students can learn according to their abilities and can fulfill all the competencies that must be mastered. E-module is a learning media that contains materials, videos, methods, limitations, and evaluation methods that are designed systematically and attractively to achieve the expected competencies.In addition, e-modules must meet several criteria, including flexibility, updates, and ease of use.

Based on the description above, researchers will conduct a survey of needs analysis of e-Modules based on Personalized System Of Instruction in Online Learning of Physical Education at Junior High School level. Section 2 reviews all materials and methods. Section 3 presents the result. Section 4 presents the discussion about this study and finally Section 5 concludes with some direction for future work.

Materials and methods

Study participants

The sample in this study were teachers who were

members of the Physical Education Teacher Deliberation Forum at the Junior High School level in Klaten Regency, Central Java, Indonesia. An electronic questionnaire was administered via Google Form to 86 teachers and a total of 61 teachers responded and completed the questionnaire (ie response rate of 70.93%).

Study organization

This study uses a quantitative approach with a survey method. The purpose of this study was to determine the need for e-modules based on Personalized System of Instructions (PSI) in online learning for junior high school physical education in Klaten Regency, Central Java, Indonesia. The data collected consists of three factors, namely the condition of online learning for physical education, the teacher's need for e-modules, and the teacher's need for the Personalized System of Instructions learning model. The data collection instrument in this study used a questionnaire that was compiled including closed and open questions.The questionnaire consists of 24 questions (5 open questions and 19 closed questions). Closed questions use the Guttman scale in the form of "Yes" or "No" answers to get a firm answer regarding the teacher's needs. The research instrument is validated through expert judgment by three experts consisting of 2 physical education experts and 1 physical education teacher as a practitioner. The validity of the instrument was proven by measuring the expert agreement index based on the Aiken Index (V) index as shown in Table 1.

The survey permit letter was sent to the Chair of the Junior High School Subject Teacher Deliberation Forum. Furthermore, electronic questionnaires were distributed to teachers via WhatsApp groups in the form of a google form link. The electronic questionnaire will be filled out on 7-14 October 2021. These steps of the study can be easily seen in the figure 1.

Table 1.
The validity of questionnaire

Number	Factors	Questions Number	Aiken's index	Category
1	the condition of online learning for physical education	1, 2, 3, 4, 5, 6, 7, 11, 12	0.80	High validity
2	the teacher's need for e-modules	13, 14, 15, 16, 17, 18, 19	0.83	High validity
3	the teacher's need for the Personalized System of Instructions learning model	8, 9, 10, 20, 21, 22, 23, 24	0.87	High validity

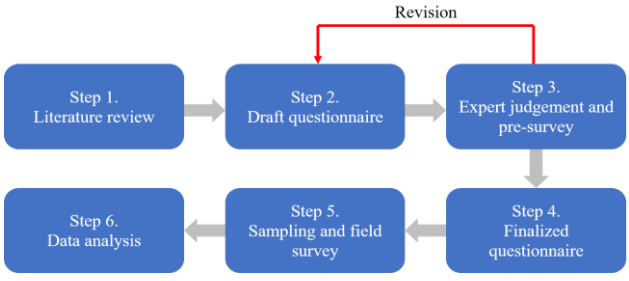

Figure 1. The steps of survey research.

Data analysis

The data analysis technique used is quantitative and qualitative descriptive statistical analysis techniques. Qualitative descriptive analysis techniques use coding and data tabulation. Meanwhile, quantitative analysis involves calculating the percentage of the total answer score based on each scoring answers from respondents use the following formula:

Table 2.
Percentage score formula

Formula	Information
$P = \frac{f}{N} x\ 100$	P is percentage of each answer f is frequency of each respondent's answer N is number of respondents

Results

61 of 86 respondents responded and filled out the questionnaire completely. The mean age of the respondents was 35.97 years (range 22-61) and the average experience as a teacher was 14.03 years (1-39).The findings of the PE online learning condition survey show that most teachers continue to provide practical learning in online learning during the Covid-19 pandemic.However, the majority of teachers stated that PE online learning was not effective. Most of the teachers stated that they encountered obstacles in teaching PE online.In response to a question about whether they have a personal device that supports online learning, 96.72% of respondents reported having one. However, a small proportion of participants (9.84%) reported that they did not have adequate skills in using technology for online learning. These results indicate that PE online learning has not been effective and there are still some obstacles and obstacles in its implementation. More detailed results can be seen in table 3.

Table 3.
Survey of physical education online learning conditions with closed questions

Number	Questions	Respons			
		Yes		No	
		Frequency	Percentage	Frequency	Percentage
1	Do you continue to provide practical learning to students in PE during the Covid-19 pandemic?	51	83.61%	10	16.39%
2	Is PE online learning during the covid-19 pandemic effective?	12	19.67%	49	80.33%
3	Do you experience any obstacles/barriers in PE online learning?	48	78.69%	13	21.31%
5	Do you have adequate personal devices (android, laptop, PC) for PE online learning?	59	96.72%	2	3.28%
6	Do you have sufficient ICT skills to manage PE online learning?	55	90.16%	6	9.84%

Furthermore, in Table 4 is part of the questionnaire with open questions. This section requires respondents to provide information about learning media, learning

models, what teaching materials the teacher uses during PE online learning. The majority of teachers use WhatsApp and Google Classroom as online learning platforms.Less than half of those who answered this question reported using Zoom Meeting, Google Meet. And a small proportion of respondents (1.64%) reported using Edmodo and Youtube.

Responding to questions about the learning model used, more than half of the respondents stated that they used Problem Based Learning. Meanwhile, less than half of the respondents reported using Discovery Learning, Blended Learning, and Personalized System of Instruction.

When asked about what teaching materials are used in PE online learning, 85.25% of the teachers stated that they provided videos for students to work on at home. More than half of the respondents stated that they provide learning textbooks and student worksheets for students to study independently.A small proportion of respondents (1.64%) reported using ebooks and modules to be given to students as independent study material.

Most of the teaching materials provided by the teacher (85.25%) were obtained by downloading from the internet. More than half of the respondents reported that they made their own teaching materials used in online learning. A small proportion of respondents (1.64%) use teaching materials provided by PE teacher forums.In short, these results show an illustration that PE online learning teachers provide learning materials and assignments to students via WhatsApp in the form of videos. More detailed results can be seen in Table 4.

Table 4.
Survey of educational online learning conditions with open-ended questions

Number	Questions	Respons		
		Answer	Frequency	Percentage
4	What digital platforms have you used in PE online learning during the Covid-19 pandemic? (Can answer more than one)	WhatsApp	54	88.52%
		Zoom Meeting	24	39.34%
		Google Meet	17	27.87%
		Google Classroom	32	52.46%
		Edmodo	1	1.64%
		YouTube	1	1.64%
		Google Form	4	6.56%
		Ge School	2	3.28%
7	What learning models have you used in PE online learning during the Covid-19 pandemic? (Can answer more than one)	Discovery Learning	21	34.43%
		Problem Based Learning	28	45.90%
		Blended Learning	28	45.90%
		Personalized System of Instruction	14	22.95%
11	What teaching materials have you used in PE online learning during the Covid-19 pandemic? (Can answer more than one)	Textbook	46	75.41%
		Student Worksheet	45	73.77%
		Presentation Slides	22	36.07%
		Videos	52	85.25%
		e-book	1	1.64%
		Modul	1	1.64%
12	Where did you get the teaching materials used in PE online learning during the Covid-19 pandemic? (Can answer more than one)	Self-made	40	65.57%
		Downloaded from internet	52	85.25%
		Provided school	23	37.70%
		Provided Teacher Forum	1	1.64%

In relation to the teacher's need for e-modules in PE online learning, the survey results are described in detail in Table 5. Conditions during the survey showed that more than half (62.30%) of respondents stated that they do not currently provide e-modules. However, the majority of respondents agree that PE online learning is carried out using e-modules. 93.44% of respondents agree that the use of e-modules in PE online learning helps students to practice independently. Based on the results in Table 6, it is stated that the majority of respondents agree that PE online learning with the help of e-modules. The next part of the survey, respondents are asked to provide what material topics are suitable if taught using e-modules. As a result, the material that was chosen by the most respondents (57,38%) was 2, namely the fitness, and health. Meanwhile, according to respondents, the material that is most unsuitable to be taught using e-modules is swimming (7.1%). More detailed results findings can be seen in Table 6.

Table 5.
Teacher needs for e-modules

Number	Questions	Respons			
		Yes		No	
		Frequency	Percentage	Frequency	Percentage
13	Do you provide teaching materials in the form of e-modules for students?	23	37.70%	38	62.30%
14	Do you agree that PE online learning is done with the help of android-based e-modules?	54	88.52%	7	11.48%
15	Do you agree that e-modules can help students in doing independent practice?	57	93.44%	4	6.56%
17	Do you agree, the use of android-based e-modules will facilitate the implementation of PE online learning?	60	98.36%	1	1.64%
18	Do you agree, the use of android-based e-modules will increase students' interest in learning?	50	81.97%	11	18.03%
19	Do you agree, the use of android-based e-modules will make it easier for students to master the material/practice?	53	86.89%	8	13.11%

Table 6.
Materials that are suitable to be taught using e-modules

Number	Questions	Respons		
		Answer	Frquency	Percenage
16	Which PE material would you like to teach online using e-modules? (Can choose more than one)	Big-ball game	26	42.62%
		Small-ball game	23	37.70%
		Athletics	24	39.34%
		Martial arts	24	39.34%
		Fitness	35	57,38%
		Gymnastics	20	32.79%
		Rhythmics	28	45.90%
		Swimming	7	11.48%
		Health	35	57,38%

At the end of the survey, respondents were asked for their opinion regarding the need for the PSI model in PE online learning.47.54% of respondents stated that they had used the PSI learning model. The majority of respondents (90.16%) agree that PE drainage learning is carried out using the PSI learning model. Overall, these results indicate that the PSI learning model needs to be applied in PE online learning. More detailed results can be seen in Table 7.

Table 7.
Teacher needs for the PSI learning model

Number	Questions	Respons			
		Yes		No	
		Frequency	Percentage	Frequency	Percentage
8	Have you ever used the Personalized System of Instruction (PSI) learning model?	29	47.54%	32	52.46%
9	Do you agree that PE online learning is carried out using the Personalized System of Instruction (PSI) learning model?	55	90.16%	6	9.84%
10	Do you agree that self-practice assignments to students in PE online learning are effective?	31	50.82%	30	49.18%
20	Do you agree that it is necessary to involve other people (parents/family members/friends) to supervise and assist students in PE online learning?	60	98.36%	1	1.64%
21	Do you agree that a student must have mastered one material before moving on to the next?	45	73.77%	16	26.23%
22	Do you agree, if there are students who have difficulties, they need to be given the opportunity to repeat the material/practice until they are successful?	55	90.16%	6	9.84%
23	Do you agree, there should be a time limit for students in studying a material/practice?	48	78.69%	13	21.31%
24	Do you agree that the use of recording sheets helps in monitoring student progress in self-study?	61	100%	0	0%

Discussion

This needs assessment first aims to reveal the condition of PE online learning during the Covid-19 pandemic. The survey results show that the majority of PE teachers continue to carry out practical learning, while a small number of teachers only provide theoretical learning. This condition is caused by several obstacles or obstacles experienced by the teacher. The first obstacle is that most students do not have PE practical learning facilities at home; (2) student responses are less enthusiastic in online learning; (3) student delays in collecting practical assignments in the form of videos; (4) internet network constraints; (5) teachers find it difficult to supervise when students practice independently; and (6) the teacher has difficulty in correcting the students' wrong movements.

These results are the same as previous studies that PE online learning conditions cannot run optimally because the equipment needed to practice by students is rarely available at home (Laar et al., 2021; Pratama et al., 2024). Another study by Chan et al. (2021) stated that PE online learning was not effective for increasing mastery of motor skills and level of physical activity.The main reasons were "lack of practical training", "lack of motivation/interest in student learning", and "limited interpersonal interactions".

The second objective to be revealed through this survey is the teacher's need for e-modules for PE online learning.Based on the survey results, the majority of respondents agree that PE online learning with the help of e-modules. The type of PSI model is students can do activity with the intensity of that has been specified in the module. In addition students can also on the monitoring of the own level fitness by means of evaluation or helplessly with friends. Steps place between the presenting PSI learning models. First, teacher give a module to the student; second, every student read carefully and try to understand the module. Third, student can do activity from the module directly. PSI get its name from the fact that each student is served as an individual by another person face to face and one to one in spite of fact that the class may contain number of students. It is suitable for courses for the student is expected to acquire a well-defined body of knowledge or skill (Kwon, 2020; Arifin et al., 2024). Within these modules, student can acquire knowledge of physiological responses of the body to these type of training, as well as how to apply the FITT principle and program design to their training program.

When student learn physical education with PSI module, so they will learn in own. Based on finding, students will be better understand module if the module specify details from rules and the activity to be done by students. In the conventional learning model, teaching based teacher centered are more dominant Students will do all instruction given by teachers but, learning conventional model not giving understanding about knowledge material fitness corporeal on students. The results indicate that the

PSI model could be an effective way to increase HRF knowledge with high school students. This study shows no significant differences in class time PA between the PSI and traditional model, indicating that through the use of PSI, students can increase their knowledge while maintaining current activity levels (Prewitt et al., 2015; Salafi et al., 2023). PSI earning model grant more for students learning to independently. When the children aware of physical fitness, the more easily in understanding matter in module.

Conclusions

In conclusion, our research shows that PE online learning conditions have not been effective during the Covid-19 pandemic. This is indicated by the number of teachers who experience obstacles in implementing PE online learning. Furthermore, teachers need e-modules as student learning materials independently at home in PE online learning. The majority of teachers agree that the use of e-modules in PE online learning helps students to practice independently. Meanwhile, it is necessary to apply a personalized system of instruction learning model in PE online learning. The majority of teachers agree that the principles of the personalized system of instruction learning model can be applied in PE online learning which demands independent learning for each student. The various information from the needs assessment can be used as a basis for developing an e-module based on a personalized system of instructions for PE online learning.

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Conflict of interest

All the authors of this research declare if there is no conflict of interest for this research.

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