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The Correlation between Dietary Compliance and Random Blood Glucose Levels in Patients with Type 2 Diabetes Mellitus

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Abstract: Diabetes mellitus is a chronic disease that is a major problem of morbidity and mortality worldwide. Type 2 diabetes mellitus is caused by several factors, one of which is dietary compliance, which is key to the management of type 2 diabetes mellitus and long-term glycemic control. Research Objective to determine whether or not there is a relationship between the level of dietary compliance with the level of random blood sugar levels of patients with type 2 diabetes mellitus. **Methods:** A quantitative research type with a cross-sectional approach method with a total of 50 respondents. **Results:** Based on the results of statistical tests using Spearman Rho with $\alpha = 0.05$ (5%) between the level of dietary compliance with random blood sugar levels of patients with type 2 diabetes mellitus in May 2024 showed a significant value of $\rho = 0.008$ (ρ-value <0.05) and the direction of the strength of the relationship with a value of $r = -0.369$ which means it shows the variable is sufficient correlated. **Conclusion**: There is a significant relationship between the level of dietary compliance and random blood sugar levels in patients with type 2 diabetes mellitus.

Keywords: Blood sugar level; Diabetes mellitus; Dietary adherence level

Introduction

Diabetes Mellitus Type 2 is a chronic metabolic disorder distinguished by persistent hyperglycemia and abnormalities in carbohydrate metabolism, frequently arising from the body's diminished capacity to produce or respond to insulin (Zainuddin et al., 2023). An estimated 537 million people suffer from diabetes, and this number is projected to reach 643 million by 2030 and 783 million by 2045. In Indonesia, the prevalence of diabetes mellitus among individuals aged 15 years or older was reported to be 1.5% in 2013. By 2018, this figure had risen to 2%, indicating an increase in the diabetic population within the country (Natania et al., 2020). According to data from the Institute for Health Metrics and Evaluation, diabetes mellitus was the third leading cause of death in Indonesia in 2019, with approximately 57.42 deaths per 100,000 population. According to the results of the Riskesdas (2018), the prevalence of diabetes mellitus in Indonesia reached 2.0%, with the highest prevalence in DKI Jakarta at 3.4%, East Kalimantan and Yogyakarta at 3.1%, North Sulawesi at 3.0%, and East Java at 2.6% (Sutanegara & Budhiarta, 2000; Wahidin et al., 2024). Indonesia is among the top 10 countries with the highest prevalence of Type 2 Diabetes Mellitus at 10.8% (Soeatmadji et al., 2023).

One of the most common cases of diabetes is type 2 diabetes mellitus (Wati & Sriwahyuni, 2023). Type 2 diabetes mellitus is caused by several factors, including non-modifiable factors such as genetics, ethnicity, and family history, as well as modifiable risk factors such as obesity, low physical activity, and unhealthy eating patterns (ElSayed et al., 2024). Dietary management for

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type 2 diabetes patients includes regulating the amount, type, and schedule of meals throughout the day. The quantity should be tailored to individual needs, while the food types should meet dietary requirements for diabetes patients—low in simple carbohydrates, high in fiber, and having a low glycemic index. This is crucial for controlling cholesterol and blood glucose levels effectively (Gortzi et al., 2024). Non-adherence to a diabetic diet can result in uncontrolled blood sugar levels, increasing the risk of complications such as cardiovascular disease, kidney disease, nerve damage, and eye damage (Sabarathinam, 2023). Compliance with dietary recommendations is vital for diabetes patients to manage their blood sugar levels.

This research provides a novel contribution by specifically examining the relationship between dietary compliance and random blood glucose levels in patients with Type 2 Diabetes Mellitus (T2DM) at Bhayangkara Hospital, Surabaya, an area where studies on this topic remain limited. Unlike previous studies that generally assess dietary adherence in diabetes management, this research focuses on real-world patient data within a specific healthcare setting, offering localized insights into dietary patterns and glycemic control.

Dietary compliance is pivotal in managing blood glucose levels in individuals with type 2 diabetes mellitus. It encompasses adhering to a structured eating plan that emphasizes portion control, balanced macronutrient intake, and the avoidance of high-glycemic index foods (Gortzi et al., 2024). The cornerstone of diabetes management is medical nutrition therapy, which emphasizes individualized meal plans, lifestyle changes, and self-management education. Self-management education empowers patients to make informed decisions regarding their diet, physical activity, and medication adherence, enabling them to achieve optimal glycemic control and mitigate the risk of long-term complications (Kumah et al., 2021). Management of T2DM includes lifestyle modifications, such as improving dietary habits and exercise, as well as appropriate medications (Pulungan et al., 2018).

Method

This study is an observational study with a cross-sectional research design, which is conducted to observe the relationship between variables at a specific point in time without follow-up. The researcher employed a non-probability sampling technique using purposive sampling to select participants based on predetermined inclusion and exclusion criteria. The study was carried out at the Internal Medicine Clinic of Bhayangkara Hospital Surabaya over three weeks (May–June 2024). The study population consisted of outpatients aged over 40 years who had been diagnosed with type 2 diabetes mellitus and visited the hospital during the research period. A total of 50 respondents met the inclusion criteria. Data were collected using the Self-Management Dietary Behavior Questionnaire (SMDBQ), which consists of 16 questions, and blood glucose levels were measured using a glucometer by medical personnel.

Result and Discussion

Based on the Table 1, respondents over 65 years of age had the highest percentage (24.0%), with 12 people, while the age group with the lowest percentage was 40-45 years, with 4 people. Based on the research results, it was found that the majority of Type 2 DM patients at Bhayangkara Hospital Surabaya were over 65 years old, with 12 out of 50 respondents (24%) falling into this age group. The average age of respondents was 64.5 years, with the youngest being 40 years old and the oldest 82 years old.

Table 1. Age Frequency Distribution

Age	Freq	%	Cumulative %
40-45	4	8.0	8.0
46-50	5	10.0	18.0
51-55	9	18.0	36.0
56-60	10	20.0	56.0
61-65	10	20.0	76.0
>65	12	24.0	100.0

Individuals with diabetes mellitus who are over 60 years old tend to have blood glucose levels above normal. This is due to the natural decline in organ function with age, leading to decreased insulin sensitivity. As a result, older adults are more susceptible to insulin resistance. This is compounded by the fact that the frequency of type 2 diabetes increases with age (Pokharel et al., 2012). The increased prevalence of diabetes and impaired glycemia in older age groups underscores the need for targeted interventions and healthcare strategies (Leung et al., 2018). Lifestyle factors such as physical activity and dietary habits also play a crucial role, and changes in these areas can significantly impact blood glucose control in older adults. Goals of care need to be individualized for the elderly patient with diabetes (Kalyani & Egan, 2013). Blood glucose control plays a crucial role to prevent complications arising from DM (Natania et al., 2020).

The data on table 2, showed that most of the respondents were female, with 31 people, while 19

respondents were male. The research results indicate that more than half of the respondents were female, totaling 31 individuals (62%), while the remaining 19 respondents (38%) were male. Women are more frequently diagnosed with diabetes, which may be influenced by several factors, including genetic predisposition and hormonal factors such as estrogen and progesterone, as well as early menarche and irregular menstrual cycles.

Table 2. Gender Frequency Distribution

Gender	Freq	%	Cumulative %
Male	19	38.0	38.0
Female	31	62.0	100.0

Lifestyle factors such as physical activity, smoking habits, and dietary patterns also contribute to the development of diabetes. In East Asia, being male was once considered a sustained risk factor for T2DM with aging, but after the age range of 50–59, the number of diabetic women increased significantly (Yuan et al., 2018). More attention should be given to the blood glucose monitoring of middle–aged men and elderly women (Yuan et al., 2018). The prevalence of diabetes in older adults is a significant and growing public health problem (Kirkman et al., 2015). Additionally, men in the 30–50 age range are more likely to develop type 2 diabetes, but after 50–59 years old, the number of diabetic women increases significantly (Yuan et al., 2018). The proportion of females ranged from 49.20% to 81.65%, and the mean age varied from 18 to 76 years in other studies (Akhtar et al., 2019).

Table 3. Educational Level Frequency Distribution

Level Education	Freq	%	Cumulative %
Elementary school	8	16.0	16.0
Junior high school	3	6.0	22.0
Senior High School	20	40.0	62.0
College	19	19.0	100.0

Based on the Table 3, the majority of respondents graduated from high school, with 20 people, while the smallest number of respondents graduated from junior high school, with 3 people. The study results indicate that the majority of respondents had a high school education level, totaling 20 individuals (40%), followed by 19 individuals (38%) with a college education, while the remainder had elementary, middle school, and higher education levels. Education level is closely related to one's knowledge. Individuals with higher education levels tend to have more information and easily understand health information, including information about diabetes mellitus and its management, thereby increasing their level of dietary compliance (Kirkman et al., 2015; Pani et al., 2008). Higher education levels are associated with better knowledge compared to those with lower education levels. Individuals with higher education tend to have better self-control, proper thinking, and experience in dealing with problems. Therefore, it can be concluded that a good education can influence behavior and lifestyle changes (Hahn & Truman, 2015).

Table 4. Type of work Frequency Distribution

Type of work	Freq	%	Cumulative %
Housewife	22	44.0	44.0
Self-employed	8	16.0	60.0
Retired/doesn't work	6	12.0	72.0
PNS/POLRI/TNI	14	28.0	100.0

The table 4 illustrates the frequency distribution of job types among the respondents. The majority were housewives, comprising 22 respondents, followed by civil servants/police/military personnel (PNS/POLRI/TNI) with 14 respondents. The research results indicate that the majority of respondents were housewives, totaling 22 individuals. This suggests that housewives may have more time to manage their diet and overall health compared to individuals with demanding work schedules. Jobs with low physical activity levels lead to reduced energy expenditure, resulting in excess energy being stored as fat in the body. This can lead to obesity, which is one of the risk factors for diabetes. Socio-economic status affects the patients' abilities to have access to proper management modalities (Aljulifi, 2021).

Table 5. Duration of Diabetes Mellitus Frequency Distribution

Duration	Freq	%	Cumulative %
<1 yr	6	12.0	12.0
2-4 yr	15	30.0	42.0
5-8 yr	17	34.0	76.0
>10yr	12	24.0	100.0

Based on the table 5, most of the respondents had suffered from diabetes mellitus for 5-8 years, with 17 people, while the smallest number of respondents had suffered from diabetes mellitus for less than 1 year, with 6 people. The research results indicate that the majority of respondents have a history of suffering from diabetes mellitus for more than 10 years, totaling 17 individuals (34%). The longer a person has diabetes, the more likely they are to feel bored and fatigued with a monotonous and continuous diet regimen. In many regions, a substantial proportion of individuals with type 2 diabetes have had the condition for less than 5 years (Bukhsh et al., 2019).

Based on the table 6, the distribution of dietary adherence levels showed that most respondents had

moderate adherence, with 35 people, and none of the respondents had low adherence. The study indicated that the majority of respondents had moderate adherence to their prescribed diet, with 35 out of 50 participants falling into this category, while complete adherence to both medication and dietary treatment was also observed among some respondents (Emmanuel & Otovwe, 2015).

Table 6. Frequencies of Level of Diet Adherence

Diet Adherence	Freq	%	Cumulative %
High Adherence	15	30.0	30.0
Moderate Adherence	35	70.0	100.0
Low Adherence	0	0.0	100.0

According to the research results, nearly half of the respondents exhibited high dietary compliance behavior, while the other half demonstrated moderate dietary compliance behavior, with none showing low dietary compliance. These results reveal that the majority of type 2 diabetes mellitus patients at Bhayangkara Hospital Surabaya are aware of the importance of dietary compliance in controlling their blood glucose levels. This suggests that while many patients understand the importance of dietary management, consistently adhering to dietary recommendations can be challenging. Adherence to a diabetic diet is influenced by several factors, including individual knowledge, beliefs, and attitudes toward food and health. Cultural and social factors also play a significant role, as dietary habits are often deeply ingrained in traditions and family practices. Furthermore, the availability and accessibility of healthy food choices can significantly impact adherence to dietary recommendations. Patients' beliefs about their illness, treatment, and prognosis also impact adherence. The challenges of adherence are further compounded by factors such as the complexity of medication regimens, potential side effects like weight gain or hypoglycemia, and the cost of medications, all of which can negatively impact a patient's willingness or ability to adhere to their prescribed treatment plan (García-Pérez et al., 2013).

Addressing these barriers requires a multifaceted approach that includes simplifying treatment regimens, providing comprehensive education and support, and addressing financial constraints (Kassahun et al., 2016). Self-discipline was identified by respondents as a key factor in improving adherence to treatment, while lack of awareness regarding the seriousness of the disease was noted as a major challenge. Effective communication between healthcare providers and patients is crucial for enhancing treatment adherence and improving health outcomes in individuals with type 2 diabetes (García-Pérez et al., 2013).

The distribution of random blood sugar levels among the respondents indicated that nearly half had normal levels (23 respondents), while 16 respondents were in the pre-diabetes range, and 11 respondents had diabetes The results of this study also show that 33 respondents had uncontrolled random blood glucose levels, while 17 respondents had controlled random blood glucose levels. This study is in line with research, where the majority of Type 2 DM patients had uncontrolled blood glucose levels (Fang et al., 2021). Uncontrolled blood glucose levels can be caused by several factors, such as low medication adherence, poor dietary patterns, lack of physical activity, and high stress levels (Bin Rakhis et al., 2022). Adherence to therapies, including medication and lifestyle modifications, is essential for maintaining glycemic control and reducing the risk of cardiovascular complications in patients with type 2 diabetes (García-Pérez et al., 2013).

Table 7. Frequencies of Random Blood Glucose Levels

Random Blood Glucose(mg/dL)	Freq	%	Cumulative %
Normal (<140 mg/dL)	23	46.0	46.0
Pre-diabetes (140-199 mg/dL)	16	32.0	78.0
Diabetes (>200 mg/dL	11	22.0	100.0

Digital health interventions are effective tools to help people with type 2 diabetes mellitus to increase their physical activity, follow dietary guidelines and improve their self-management skills (Nguyen et al., 2024). These interventions provide personalized support and guidance, tailored to individual needs and preferences, and empower individuals to take an active role in managing their condition. Strategies to improve adherence should address factors such as regimen complexity, patient education, and communication (García-Pérez et al., 2013). Further research is needed to explore the effectiveness of different intervention strategies and identify the most effective approaches for improving adherence and achieving optimal glycemic control in patients with type 2 diabetes (Emmanuel & Otovwe, 2015; García-Pérez et al., 2013; Polonsky & Henry, 2016). Providers should also be aware that patients who seem uncomplicated might need more support to overcome barriers to adherence, including accepting the reality of having a chronic illness (Kirkman et al., 2015).

Based on the table 8 The higher the score, the better the dietary compliance behavior in diabetes mellitus (DM), while the lower the score, the poorer the dietary compliance behavior. The questionnaire assessment is divided into three levels: high dietary compliance behavior (score 49-64), moderate dietary

compliance behavior (score 32-48), and low dietary compliance behavior (<32).

Table 8. Cross-Tabulation of the Relationship Between Dietary Adherence Levels and Random Blood Glucose Levels in Type 2 Diabetes Patients

Level of Diet Adherence	Random Blood Glucose Levels (mg/dL)						Total	
	Normal		Pre-DM		DM			
	f	%	f	%	f	%	f	%
High	7		7	14	1	2	15	
Moderate	16		9				35	
Low	0	0	0	0	0	0	0	0
Total	23						50	

Spearman's rho α = 0.05 obtained ρ = 0.008 and r = -0.369.

Based on the table above, respondents with a high level of dietary compliance and normal random blood glucose levels accounted for 7 people (14%). Additionally, respondents with high dietary compliance and pre-diabetes blood glucose levels totaled 7 people (14%), while those with high dietary compliance and diabetes blood glucose levels amounted to 1 person (2%), making a total of 15 people (30%). For the moderate dietary compliance category, 16 respondents (32%) had normal blood glucose levels, 9 respondents (18%) had pre-diabetes blood glucose levels, and 10 respondents (20%) had diabetes blood glucose levels, with a total of 35 respondents (70%).

Statistical analysis using the Spearman Rho test with α = 0.05 (5%) showed a significant value of ρ = 0.008 (ρ-value < 0.05) and a coefficient of r = -0.369. Thus, it can be concluded that the hypothesis is accepted, indicating a statistically significant and moderately correlated relationship between dietary compliance levels and random blood glucose levels in type 2 diabetes mellitus patients at Bhayangkara Hospital Surabaya. The negative correlation coefficient indicates an inverse relationship, meaning that the higher the level of dietary compliance, the lower the random blood glucose level, and vice versa. The importance of adherence to treatment plans, including medication and diet, is underscored by the potential for improved health outcomes (DiBonaventura et al., 2014).

The research indicates a significant inverse relationship between dietary adherence and random blood glucose levels in patients with type 2 diabetes mellitus, highlighting the critical role of dietary management in glycemic control (Antes et al., 2020). Nonadherence to treatment regimens, including dietary guidelines, has been linked to increased physician visits, emergency room visits, and hospitalizations, emphasizing the broader healthcare implications of poor adherence (DiBonaventura et al., 2014). It is essential to consider patient-specific factors, such as the use of traditional medicine and the overconsumption of certain foods, which may contribute to nonadherence (Emmanuel & Otovwe, 2015).

The results of the Spearman's Rho correlation test showed a significance value of 0.010 ($p < 0.05$), indicating a significant relationship between dietary adherence and random blood glucose levels in Type 2 diabetes mellitus patients at Bhayangkara Hospital Surabaya. The higher the level of dietary adherence, the more controlled the patient's random blood glucose levels. The results of this study align with findings that there is a significant correlation between adherence to a diabetic diet and blood sugar levels (Wulandari et al., 2021). This highlights the importance of dietary compliance in controlling blood glucose levels in individuals with type 2 diabetes mellitus.

Good dietary adherence helps regulate blood glucose levels, preventing potential complications associated with diabetes mellitus (Gortzi et al., 2024). Maintaining glycemic levels within physiological levels can reduce or minimize the risk of diabetic complications in the long term for patients with type 1 and type 2 diabetes. Shorter-term blood sugar control can also have a significant impact on health outcomes, with significantly higher or lower readings resulting in significant morbidity, mortality, and healthcare utilization. This highlights the importance of managing glycemic control, not only for long-term health but also for immediate well-being and healthcare costs. This correlation underscores the importance of dietary interventions in managing blood glucose levels in individuals with type 2 diabetes. Appropriate modification and monitoring of food intake can assist with weight management as well as with the control of both blood glucose and lipid levels. The findings underscore the critical role of nutrition therapy in both the development and management of diabetes.

Conclusion

The study concludes that there is a significant relationship between dietary adherence and random blood glucose levels among patients with type 2 diabetes mellitus at Bhayangkara Hospital Surabaya. The study emphasizes the importance of dietary adherence in managing blood glucose levels and preventing complications in patients with type 2 diabetes mellitus, suggesting that healthcare providers should focus on promoting and supporting dietary adherence as a key component of diabetes management. Future research should explore strategies to improve dietary adherence among patients with type 2 diabetes mellitus.

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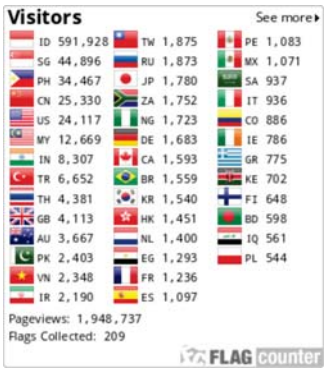

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INFORMATION

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Research Articles Review **Published:** 2025-04-30

Assessing Dipterocarp Diversity at Soraya Research Station, Leuser Ecosystem

Essy Harnelly , Irma Fitri , Iqbar , Yunita , Hendrix Indra Kusuma 1-9

DOI: 10.29303/jppipa.v11i4.10599
Statistics: 181 | 324 Citations 0

PDV

Integration of STEM Approach in Science Education: Enhancing Students' Critical Thinking, Creativity, and Engagement in Elementary Schools in Palembang

Esti Susiloningsih , Apit Fathurohman , Siti Dewi Maharani , M. Fatih Fathurohman , Suratmi , Dwi Cahaya Nurani 10-19

DOI: 10.29303/jppipa.v11i4.10615
Statistics: 245 | 271 Citations 0

PDV

Organoleptic Test and Hedonic Test on Biscuits Made from Sweet Potato Leaves and Tilapia Fish

Sulastry Pakpahan , Ganda Agustina Hartati Simbolon , Tienne Artha Ulina Nadeak 20-31

DOI: 10.29303/jppipa.v11i4.10641
Statistics: 122 | 174 Citations 0

PDV

Resilient Ecosystems: Key to Environmental Disaster Resilience and Logistics Efficiency

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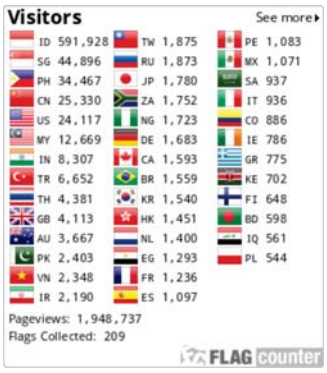

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Journal Tools

Keywords

Djohar , Dety Junita 32-40

DOI: 10.29303/jppipa.v11i4.10710
Statistics: 94 | 81

Citations 0

PDV

The Development of Science Learning Modules Based on PjBL-STEM to Improve Creative Thinking Skills on Environmental Pollution Materials

Destama Einstean Shodiq , Muzzazinah , Prabang Setyono 41-47

DOI: 10.29303/jppipa.v11i4.10729
Statistics: 160 | 171

Citations 0

PDV

ARNI vs ACE Inhibitors in Improving Left Ventricular Geometry, Diastolic Function, and Cardiac Power Output in HFrEF Patients: A Prospective Cohort Study among Acehnese, Indonesia

Taufiqurrahman , Teuku Heriansyah , Adi Purnawarman , Novita , Zulkarnain 48-56

DOI: 10.29303/jppipa.v11i4.10593
Statistics: 93 | 67

Citations 0

PDV

Development of an Outcome-Based Education (OBE) Approach in Conservation Biology Lectures to Increase Student Awareness and Conservation Efforts in the Campus Environment

Evi Apriana , Djufri , Abdullah , Nurlena Andalia 57-67

DOI: 10.29303/jppipa.v11i4.10113
Statistics: 77 | 66

Citations 0

PDV

Design and Development of Website and Android-Based Aceh Biodiversity Applications

Muhammad Subianto , Essy Harnelly , Alim Misbullah , Razief Perucha Fauzie Afidh , Fikrul Akhyar , Muhammad Irfan , Wira Dharma , Nazaruddin , Zulfan 68-80

DOI: 10.29303/jppipa.v11i4.10535
Statistics: 89 | 68

Citations 0

PDV

The Effect of Problem Based Learning Model and Differentiation Approach on the Results of Natural and Social Science Learning of Grade V Students

Leny Amalia , Ika Ratnaningrum 81-93

DOI: 10.29303/jppipa.v11i4.10935
Statistics: 113 | 126

Citations 0

PDV

Utiliization of Natural Compound from Pegagan (Centella asiatica (L.) Urb.) and Their Potential Role in the Health Sector

Ratna Lestyana Dewi , Ratna Yuniati , Yasman 94-103

DOI: 10.29303/jppipa.v11i4.10558

Development of 21st Century Skills Integrated Mini Research E-Assessment for Prospective Teacher

Rahma Widiantie , Ina setiawati , Edi Junaedi , Sifa Pajar Amanah 104-112

DOI: 10.29303/jppipa.v11i4.10512

Development of Pop Up Book Media to Improve Motivation and Learning Outcomes of Natural and Social Sciences for Grade IV Elementary School

Marsanda Salwa Nisrina , Fitria Dwi Prasetyaningtyas 113-122

DOI: 10.29303/jppipa.v11i4.10836

Correlation between Average Microplastic Abundance and Water Quality Parameters in Sendang Biru Waters, Malang Regency

Ahmad Nuril Fuad Al Fatih , Andi Kurniawan , Maharani Pertiwi Koentjoro 123-131

DOI: 10.29303/jppipa.v11i4.9794

The Effectiveness of the Problem-Based Learning Model Assisted by Augmented Reality on Learning Outcomes in the Material of the Forms of the Five Senses and Their Functions

Fajar Aunurofiq , Novi Setyasto 132-141

DOI: 10.29303/jppipa.v11i4.10321

Factors Associated with Medical Students' Readiness of Interprofessional Education Implementation: Findings from A Medical School in Indonesia

Flora Ramona Sigit Prakoeswa , Harun Joko Prayitno , Saiful Hidayat , Ratih Pramuningtyas , Erika Diana Risanti 142-146

DOI: 10.29303/jppipa.v11i4.10745

Enhancing Critical Thinking and Learning Outcomes: The Impact of Differentiated Learning Strategies in Elementary School

Luluk Fidiasih , Eges Triwahyuni , Ahmad Zaki Emyus 147-153

DOI: 10.29303/jppipa.v11i4.10611

PDV

The Impact of Hybrid Learning on Student Engagement and Academic Performance in Post-Pandemic Science Education

Tri Yuni Hendrowati , M. Badrun , Siswoyo , Ana Istiani

154-165

DOI: 10.29303/jppipa.v11i4.10701

The Relationship between Communication Behavior and Agricultural Extension Facilities Equipment in the Digital Era in South Bangka Regency

Yulia , Eddy Jajang Jaya Atmaja , Monica Kharisma Swandhi

166-172

DOI: 10.29303/jppipa.v11i4.10741

Development of Diversity Monopoly Game Smart Board Learning Media to Improve IPAS Learning Outcomes of Grade IV Elementary School Students

Erika Septianing Rustianti , Sri Sami Asih

173-186

DOI: 10.29303/jppipa.v11i4.10706

Implementation of E-Module Containing Local Wisdom Based on the Theory of Conceptual Change to Improve Understanding High School Students' Concepts on Work and Energy Materials

Nova Anjarwati , Ketang Wiyono , Ida Sriyanti

187-194

DOI: 10.29303/jppipa.v11i4.8668

Amino Acid Content Profile and Antioxidant Activity Test of Spirulina Platensis Bioactive Protein Extract Using DPPH Method

Tahirah Hasan , Nur Ida , Yasnidar Yasir

195-201

DOI: 10.29303/jppipa.v11i4.10916

Supercapacitors from Reduced Graphene Oxide Material

Maryati Doloksaribu , Makmur Sirait , Erniwati Halawa , Mukti Hamjah Harahap

202-208

DOI: 10.29303/jppipa.v11i4.11027

Secondary Metabolites and Antioxidant Properties of Lichens from Sicike-Cike Nature Park, North Sumatra

Putri Amelia Lubis , Etti Sartina Siregar , Isnaini Nurwahyuni

209-215

DOI: 10.29303/jppipa.v11i4.11042
Statistics: 74 | 77

PDV

Optimizing Ketamine-Propofol Collaboration to Prevent SpO_2 Decrease in TIVA Patients at RSU Emanuel Banjarnegara

Rahmaya Nova Handayani , Sakhfa Syesar Novaliyanto , Surtiningsih 216-223

DOI: 10.29303/jppipa.v11i4.10982
Statistics: 104 | 62

PDV

Determination of SPF (Sun Protection Factor) Value in Sunscreen Formulation of Vetiveria Zizanioides L. Essential Oil

Waode Suiyarti , Ervianingsih , Chitra Astari , Riska , Sunarto S 224-227

DOI: 10.29303/jppipa.v11i4.10893
Statistics: 100 | 57

PDV

A Reconstruction of Boiling Point Elevation Apparatus

Ijang Rohman , Liliasari , Nurhamida Anar , Triannisa Rahmawati 228-234

DOI: 10.29303/jppipa.v11i4.9070
Statistics: 84 | 91

PDV

Community-Based Total Sanitation Practices in Families Suffering from Stunting in Raknamo Village, District Amabi Oefeto, Kupang Regency

Albina Bare Telan , Lidia Br Tarigan , Enni Rosida Sinaga , Yulia 235-242

DOI: 10.29303/jppipa.v11i4.10744
Statistics: 61 | 40

PDV

The Effectiveness of Implementing Learning Style Differentiation on Science Learning Interests and Outcomes in Elementary Schools

Eliya Kusuma Pratiwi , Dewi Nilam Tyas 243-253

DOI: 10.29303/jppipa.v11i4.10670
Statistics: 68 | 59

PDV

The Effectiveness of Interactive Android Modules through the Culturally Responsive Teaching (CRT) Approach Integrated with Differentiated Learning to Improve the Learning Outcomes of Junior High School Science Independent Curriculum Students

Yurnetti , Khairil Arif , Harmedi Yulian Saputra , Tifani Aisya Djuazva 254-264

DOI: 10.29303/jppipa.v11i4.10707
Statistics: 63 | 52

PDV

Development of E-Modules for Students' Soft Skills in Facing the World of Work in English Subjects English Subject at SMKN 1 Batam

Wiswirya Deni , Fahmi Rizal , Ambiyar , Sukardi 265-273

DOI: 10.29303/jppipa.v11i4.8653
Statistics: 74 | 58

PDV

Development of Food Chain Magic Box Media Based on Problem Based Learning to Improve the Learning Outcomes of Elementary School Grade V Students

Maharani Novtia Putri Amanda , Desi Wulandari 274-286

DOI: 10.29303/jppipa.v11i4.11043
Statistics: 71 | 55

PDV

Characterization of Agricultural Households Socioeconomic on Javanese and To Pekurehua Ethnic in Central Sulawesi Province

Rustam Abd Rauf , Lien Damayanti , Erny , Aulia Rakhman , Chitra A. Salingkat , Shintami R. Malik , Hardiyanti Sultan , Mukhlis 297-305

DOI: 10.29303/jppipa.v11i4.10891
Statistics: 69 | 45

PDV

Physical Characteristics and Antioxidant Activity of Ice Cream Blend of Coconut Milk and Red Dragon Fruit Peel Extract

Teltje Koapaha , Tineke M. Langi , Riel J. J Umboh 306-312

DOI: 10.29303/jppipa.v11i4.10889
Statistics: 117 | 76

PDV

Development of E-Modules Based on Teaching Factory in Chemistry Subjects in Vocational Secondary Schools

Anggi Dwy Okterina , Abna Hidayati , Alwen Bentri , Jasrial 313-320

DOI: 10.29303/jppipa.v11i4.10673
Statistics: 52 | 44

PDV

Analysis of Variation in Basic Chemistry Semester Learning Plans in Indonesian Universities: Learning Achievements, Learning Methods, and Evaluation

Desi Aryanti Nabuasa , Wiji , Wahyu Sopandi 321-330

DOI: 10.29303/jppipa.v11i4.9583
Statistics: 53 | 49

PDV

Identification of Misconceptions with a Three-Tier Diagnostic Test on Elementary School Students' Force Topic

Anisa Wahyu Kusumaningtyas , Dilla Putri Meydawati , Nur Hanifatun Nadhif , M Anas Thohir , Lilik Bintartik

331-338

DOI: 10.29303/jppipa.v11i4.9887
Statistics: 88 | 59

PDV

Effectiveness of STEM-Oriented Project-Based Learning Modules in Visual Communication Design to Support Science and Technology Skills in Vocational Education

Deliana , Muhammad Anwar

339-345

DOI: 10.29303/jppipa.v11i4.10542
Statistics: 52 | 38

PDV

Teaching Materials Based on Socio Scientific Issues: An Effective Strategy to Improve Science Literacy and Critical Thinking Skills

Neli Wisdayana , Achyani , Arif Rahman Aththibby

346-354

DOI: 10.29303/jppipa.v11i4.10786
Statistics: 79 | 76

PDV

Antibacterial Activity of Indonesian Medicinal Plant Extracts Tinospora crispa, Averrhoa bilimbi and Syzygium polyanthum against Shigella sonnei

Laili Fitri Yeni , Nurfatehah , Erma , Eni Eka Sari

355-363

DOI: 10.29303/jppipa.v11i4.9378
Statistics: 60 | 48

PDV

The Influence of the Implementation of the Integrated PBL (Problem Based Learning) Model with Differentiated Learning on Students' Critical Thinking Skills in Science Subjects

Tri Utami Widayati , Destrinelli , Muhammad Sofwan

364-371

DOI: 10.29303/jppipa.v11i4.10669
Statistics: 74 | 73

PDV

Evaluating and Mitigating Musculoskeletal Risks among the Operators: A Case Study in a Small-Scale Automotive Repair Workshop

Rini Oktavera , Muh Ilal Sarifudin , Wahyu Eko Cahyono , Moh. Ainul Fais , IGA Sri Deviyanti

372-381

DOI: 10.29303/jppipa.v11i4.10682
Statistics: 67 | 46

PDV

In Vitro Study of The Activity of Yellow Rope (Anamirta cocculus) Extract As An Antibacterial

Darmayanti Tumpu , A.M. Muslihin , Lukman Hardia

382-387

DOI: 10.29303/jppipa.v11i4.10753
Statistics: 99 | 70

PDV

Guided Inquiry-Based LKPD on Swamp Vegetation Biodiversity: Development and Effectiveness in Enhancing Science Process Skills

Yetty Hastiana , Bella Anjelia , Astrid Sri Wahyuni Sumah 388-397

DOI: 10.29303/jppipa.v11i4.10958
Statistics: 75 | 44

Citations 0

PDV

Scrapbook Media Development to Improve IPAS Learning Outcomes

Safira Galuh Yuniarizki , Fitria Dwi Prasetyaningtyas 398-407

DOI: 10.29303/jppipa.v11i4.11047
Statistics: 94 | 57

Citations 0

PDV

Problem-Based Learning Model to Increase Students' Science Literacy in Grade V Science Learning on Heat Transfer Topic

Srinita Susanto , Setiawan Edi Wibowo , Anisa Kurniasih , Vitry Rayani Bethesda Saragih , Annisyah Yuni 408-415

DOI: 10.29303/jppipa.v11i4.9793
Statistics: 59 | 49

Citations 0

PDV

Development of Integrated Flipbook Learning Media with 2-Dimensional Quartet Cards (KAKASIBOOK) to Improve Student Learning Outcomes in IPAS Learning Content

Restu Eri Yulianti , Barokahah Isdaryanti 416-426

DOI: 10.29303/jppipa.v11i4.10822
Statistics: 99 | 32

Citations 0

PDV

Effect of Project-Based Learnıng (PjBL) on Study Results and Critical Thinking Ability of Students ın Lathe Engıneerıng Lessons

Suyono , Wawan Purwanto , Hasan Maksum , Refdinal 427-434

DOI: 10.29303/jppipa.v11i4.8926
Statistics: 56 | 42

Citations 0

PDV

Analysis of Students' Concept Understanding Using the STEM Integrated Cognitive Conflict Model

Putri Nabila , Fatni Mufit , Fuja Novitra 435-443

DOI: 10.29303/jppipa.v11i4.10281
Statistics: 70 | 54

Citations 0

PDV

Using K-Means Clustering to Analyze Socio-Economic Welfare of Oil Palm Farmers for Decision Support and Contextual Learning Integration

Fenty Kurnia Oktorina , Zulfikar , Andri Nofiar Am , Nurkholis , Agung Pramono 444-450

DOI: 10.29303/jppipa.v11i4.10975
Statistics: 122 | 67

Citations 0

PDV

Antibacterial Activity Testing of Methanol Extract of Yellow Rope Barb (Anamirta cocculus)

Wa Ode Nurwahida , A.M. Muslihin , Lukman Hardia

451-458

DOI: 10.29303/jppipa.v11i4.10760
Statistics: 89 | 73

Citations 0

PDV

Transformation of Science Learning with Android Applications: Improving Learning Outcomes and Student Activity Through “Marbel Sains SD 4-5”

Ponco Nur Hidayah , Waris , Rina Sugiarti Dwi Gita

459-466

DOI: 10.29303/jppipa.v11i4.10613
Statistics: 50 | 30

Citations 0

PDV

Standardizing Catch Per Unit Effort (CPUE) of Coryphaena hippurus in the Southern Java Waters Using Generalized Additive Model (GAM)

Vianta Mandhalika , Bambang Semedi , Abu Bakar Sambah , Amin Setyo Leksono

467-477

DOI: 10.29303/jppipa.v11i4.9970
Statistics: 78 | 55

Citations 0

PDV

Improving Student Learning Concentration in Chemistry Using the ‘Everyone Is a Teacher Here’ Strategy Assisted by Genially Media

Elferida Sormin , Nova Irawati Simatupang , Sumiyati , Dera Savera

478-483

DOI: 10.29303/jppipa.v11i4.10782
Statistics: 92 | 52

Citations 0

PDV

Evaluation of P5 Implementation in Supporting STEM-based Learning at Vocational Schools using the CIPP Model

Nengka Putri , Remon Lapisa , Ambiyar , Arwizet K

484-491

DOI: 10.29303/jppipa.v11i4.10640
Statistics: 93 | 44

Citations 0

PDV

Disaster Mitigation through Team Games Tournament (TGT) Model Based on Start with A Question in Learning

Khairil , Afdhal Afdhal

492-498

DOI: 10.29303/jppipa.v11i4.10610
Statistics: 67 | 36

Citations 0

PDV

The Relationship Between Digital Literacy and Emotional Intelligence

on Vocational High School Students' Work Readiness

Endeli , Hansi Efendi , Hendra Hidayat 499-505

DOI: 10.29303/jppipa.v11i4.10628
Statistics: 99 | 46

PDV

The Integrating Science Education and Financial Economics to Enhance Knowledge-Based Entrepreneurship

Muhammad Nadhar , Norhaedah , Sariana , Ernawati , Syamsuni HR 506-515

DOI: 10.29303/jppipa.v11i4.10687
Statistics: 96 | 40

PDV

The Effects of Mangrove Ecosystem on Mud Crabs (Scylla serrata) in East Lombok, Indonesia

Bintang Prayoga , Dietriech Geoffrey Bengen , I Wayan Nurjaya , Nyoman Metta N. Natih 516-526

DOI: 10.29303/jppipa.v11i4.10709
Statistics: 97 | 85

PDV

Antibacterial Effectiveness Test of Wrap Leaf Extract (Smilax rotundifolia) Against Escherichia coli and Propionibacterium acnes Bacteria

Heti Aisyah , Irwandi , Angga Bayu Budiyanto , A.M. Muslihin 527-532

DOI: 10.29303/jppipa.v11i4.10699
Statistics: 93 | 82

PDV

Development of Metacognition-Based LKPD to Improve Conceptual Understanding in Reaction Rate Material

Euis Nurmiati , Sugeng Bayu Wahyono , Muhammad Risal Rhomadan , Nurul Khairah , Ulfa Nabila Tafrienda 533-541

DOI: 10.29303/jppipa.v11i4.10464
Statistics: 69 | 37

PDV

Colchicine Colchicine-Induced Phenotypic Alterations in Dendrobium 'Transient White Rika' and 'Florenza': Valuable Material for Genetics-Based Learning Modules

Dwi Sucianingtyas Sukamto , Sarwo Danuji , Hanif Rafika Putri , Nurul Komaria 542-549

DOI: 10.29303/jppipa.v11i4.10727
Statistics: 74 | 50

PDV

Analysis of Outpatient Satisfaction at Sylvani Hospital: The Influence of Service Quality on the Patient Satisfaction Index

Sugianto , Alamsyah , Susanna Halim

550-556

DOI: 10.29303/jppipa.v11i4.10866
Statistics: 80 | 36

PDV

The Influence of the PhET Virtual Lab Assisted PBL Model on Energy Transformation Material on the Learning Motivation of Elementary School Students

Tiza Ariesta Saputri , Ana Fitrotun Nisa , Akbar Al Masjid , Banun Havifah Cahyo Khosiyono

557-566

DOI: 10.29303/jppipa.v11i4.9680
Statistics: 91 | 50

PDV

Analysis of Environmental Dynamic Factors During Salt Crystallization Process in Greenhouse Salt Tunnel (A Case Study in South Coastal and North Coastal East Java, Indonesia)

Abd Aziz Amin , Adi Tiya Yanuar , Zulkisam Pramudia , Yogita Ayu Dwi Susanti , Ilham Misbakudin AL Zamzami , Lutfi Ni'matus Salamah , Riski Agung Lestariadi , Lukman Hakim , Gatot Ardian , Mokh Hanifuddin , Andi Kurniawan

567-574

DOI: 10.29303/jppipa.v11i4.7131
Statistics: 75 | 51

PDV

Air Conditioner (AC) Operation Using the Internet of Things

I Nyoman Sukarma , Beauregard Anakottapary , I Gede Ketut Sri Budarsa , I Ketut Parti

575-582

DOI: 10.29303/jppipa.v11i4.10943
Statistics: 67 | 42

PDV

The Significance of The Bio-Psycho-Spiritual Dimension in Relation to Islamic Education

Sri Haryanto

583-589

DOI: 10.29303/jppipa.v11i4.10549
Statistics: 59 | 41

PDV

Enhancing Email Security Against Phishing Attacks Through User Behavior Analysis and Data Loss Prevention (DLP)

Tamara Sinatrya Yasmin , Tomi Yulianto

590-600

DOI: 10.29303/jppipa.v11i4.10781
Statistics: 89 | 75

PDV

Intelligent Monitoring of Smoking Prohibition in Public Spaces Using YOLOv8: Real-Time Detection and Telegram Notifications

Salsabilla Azahra Putri , Murinto , Sunardi

601-610

DOI: 10.29303/jppipa.v11i4.10519
Statistics: 81 | 58

PDV

Development of Articulate Storyline based Local Content Learning Media to Improve Learning Outcomes of Elementary School Students

Eka Wulandari , Atip Nurharini 611-623

DOI: 10.29303/jppipa.v11i4.10785
Statistics: 63 | 40

PDV

Development of Photo Studio Reservation Website Design Using Design Thinking Method

Asty Yuliani , Ariq Cahya Wardhana 624-629

DOI: 10.29303/jppipa.v11i4.10909
Statistics: 101 | 95

PDV

The Correlation between Dietary Compliance and Random Blood Glucose Levels in Patients with Type 2 Diabetes Mellitus

Anita Dahliana , Agnes Mirandadea Evangelista Manek , Puri Safitri Hanum , Winnie Nirmala Santosa 630-636

DOI: 10.29303/jppipa.v11i4.10787
Statistics: 88 | 64

PDV

Development of Progressive Integrated Testing to Identify Science Concept Understanding and Misconceptions of Grade VII Junior High School Students

Desak Nyoman Srinadi , Putu Budi Adnyana , Putu Artawan 637-648

DOI: 10.29303/jppipa.v11i4.10608
Statistics: 83 | 51

PDV

The Effect of Adding Variations in the Combination of Anthocyanin Extract and Curcumin Volume Fraction on the Mechanical Properties and Biodegradability of Seaweed-Based Bioplastic Materials

Nuzulul Rahmah , Sujito , Yuda Cahyoargo Hariadi 649-656

DOI: 10.29303/jppipa.v11i4.9769
Statistics: 51 | 45

PDV

Gender in Social Forestry Progam (Case of LMDH Wono Lestari Burno Village Senduro Sub-District Lumajang District)

zakaria Yahya , Leti Sundawati , Soni Trison 657-666

DOI: 10.29303/jppipa.v11i4.10096
Statistics: 46 | 35

PDV

Characterization of Overpressure in Well Al, North Sumatra Basin: Evaluation of Pore Pressure Using the Eaton Method and Sonic-Density Crossplot

Project-Based Integrated Science Learning for Developing Students' Creative Thinking Skills: A Case Study at a Madrasah Tsanawiyah in Sukabumi City

Melda Yunita , Elin Driana , Sri Yuliawati , Ernawati

724-735

DOI: 10.29303/jppipa.v11i4.10919
Statistics: 91 | 62

Citations 0

PDV

Validity of the Development of PjBL-Based Science Teaching Modules Containing Ethno-STEAM to Empower Creative Thinking Skills on Ecology and Biodiversity Materials in Indonesia

Melynia Ariningtyas Prabawati , Sri Yamtinah , Bramastia

736-744

DOI: 10.29303/jppipa.v11i4.10952
Statistics: 94 | 60

Citations 0

PDV

Is Project-Based Learning a Guaranteed Boost for Students' Creativity? A Meta-Analytic Review

Hera Puspita Sari , Arys Rafiah , Ilham Falani

745-751

DOI: 10.29303/jppipa.v11i4.10159
Statistics: 61 | 37

Citations 0

PDV

Development of Interactive Learning Media My Indonesia is Rich in Culture INKAYA Based on Unity to Improve Science Learning Outcomes of Grade IV Elementary School Students

Yulia Cahyaningrum , Sri Sami Asih

752-762

DOI: 10.29303/jppipa.v11i4.10731
Statistics: 75 | 52

Citations 0

PDV

The Relationship between Teacher Creativity in Teaching and Student Activeness with IPAS Learning Outcomes of Grade IV Elementary School Students

Vaella Silfa Soleha , Sri Sami Asih

763-774

DOI: 10.29303/jppipa.v11i4.10877
Statistics: 70 | 35

Citations 0

PDV

Development of e-Modules Based Case Study on the Nervous System Materials for Students

Richa Amalia , Afreni Hamidah , Dara Mutiara Aswan , Jodion Siburian

775-787

DOI: 10.29303/jppipa.v11i4.10686
Statistics: 59 | 45

Citations 0

PDV

Students' Cognitive Ability Improvement on Mechanical Wave Material with Chamilo Learning Media

I Made Astra , Hilmi Khoirulloh , I Gede Indra Aryasa

788-794

DOI: 10.29303/jppipa.v11i4.10630
Statistics: 61 | 47

Citations 0

PDV

Simulation of The Conductivity Hydraulic Effect on Seawater Intrusion

Ferdy , Tirza Wungkana , Dolfie Paulus Pandara , Maria D. Bobanto , Hanny F. Sangian , Adey Tanauma , Seni H. Tongkukut , Hesky S. Kolibu

DOI: 10.29303/jppipa.v11i4.5437

Validity of Science Module Based on Problem Based Learning Multiple Representations to Improve Students' Higher Level Thinking Skills on the Topic of Acid-Base

Siti Sholikhah , Sentot Budi Rahardjo , Bowo Sugiharto

DOI: 10.29303/jppipa.v11i4.10837

The Influence of Various Types of Flipped Classroom Assisted by Learning Management System (LMS) on Creative Thinking Skills in Junior High School Students

Azmi Fathin Eka Nugraha , Adnan , Firdaus Daud

DOI: 10.29303/jppipa.v11i4.10991

Study on the Influence of Positive Learning Environment on Student Motivation and Achievement in Elementary Schools

Cikita Fadila , Harsono , Anatri Desstya

DOI: 10.29303/jppipa.v11i4.10876

Patient Satisfaction with Dental and Oral Health Services in Independent Dental Practices in Medan City in 2025

Emerentia Angela , Susanna Halim , Alamsyah

DOI: 10.29303/jppipa.v11i4.10925

Impact of Differentiated Learning Strategies on Student Resilience and Academic Performance at State Junior High School

Ely Wahyuni Hidayati , Eges Triwahyuni , Ahmad Zaki Emyus

DOI: 10.29303/jppipa.v11i4.10612

Identification of Patient Satisfaction with the Main Clinic Services of Ramanathan in Medan City

Ramanathan , Susanna Halim , Alamsyah

DOI: 10.29303/jppipa.v11i4.10924
Statistics: 54 | 34

Citations 0

PDV

Biodiversity and Relationships in Species Annonaceae Using the Phenetic Method in the Purwodadi Botanical Garden

Hamidah , Junairiah , Putri Akustia 852-861

DOI: 10.29303/jppipa.v11i4.10808
Statistics: 68 | 47

Citations 0

PDV

Community-Based Analysis of Anemia Risk Factors in Pregnant Women at Primary Healthcare

Anita Dahliana , Adinda Rizkita N. H , Chentya Catheriane L , Geraldy Aziz S. H , Isro Rafidatus S , Ketut Ayu O. S , Rinandha Yusfahreza W , Dyan Eka Puspitasari , Farida Yan Pratiwi Kurnia 862-871

DOI: 10.29303/jppipa.v11i4.10875
Statistics: 451 | 427

Citations 0

PDV

Potential Bioactivity of Carrot (Daucus carota L.) as a Health Protector Through Antioxidant, Antibacterial, and Antifungal Activities

Digna Renny Panduwati , Dian Pratiwi , Liza Mutia , Suryani MF Situmeang , Karolina Br Surbakti , Wardati Humaira , Sahala Fransiskus Marbun 872-879

DOI: 10.29303/jppipa.v11i4.9441
Statistics: 123 | 75

Citations 0

PDV

Development of ULTAGRAM Media Based on Quizwhizzer in an Effort to Increase Interest and Learning Outcomes

Tazkia Nurul 'Aini , Ika Ratnaningrum 880-888

DOI: 10.29303/jppipa.v11i4.10996
Statistics: 80 | 77

Citations 0

PDV

The Correlation between Critical Thinking Skills and Argumentation Skills of Biology Students: A Study across RQA, ADI, WE-ARe, and Conventional Learning

Astuti Muh. Amin 889-899

DOI: 10.29303/jppipa.v11i4.7849
Statistics: 54 | 44

Citations 0

PDV

Development of Website-Based Creative Content as Learning Media on Molecular Geometry

Nahadi , Hayuni Retno Widarti , Ari Syahidul Shidiq , Wiwi Siswaningsih , Atep Rian Nurhadi , Triannisa Rahmawati , Miarti Khikmatun Nais , Rara Djati Anggraeni , Hasna Athaya Rifa , Rismayanti Chusnul Chotimah , Amara Dwi Ayuni , Lusiana Citra Aphelia , Tanti Oktaviani

900-908

DOI: 10.29303/jppipa.v11i4.10116

Implementation of The Learning Sciences Approach Through The Reading and Thinking Aloud Method to Improve Reading Comprehension Skills of Elementary School Students

Erna Sefriani Sabuna , Henny Dewi Koeswanti , Stefanus Christian Relmasira

909-919

DOI: 10.29303/jppipa.v11i4.10923

Development of Technopreneur Learning Modules through Transformative Learning Strategies to Increase Student Entrepreneurial Interest

Ika Kumala Dewi , Gunadi

920-925

DOI: 10.29303/jppipa.v11i4.6888

Water Pollution Index and Microplastic Ecological Risk in The North Coastal Area of Situbondo

Arisda Maryama Santikanuri , Riyanto Haribowo , Sri Wahyuni

926-935

DOI: 10.29303/jppipa.v11i4.10990

The Diversity index and Importance Value of Herbaceous Vegetation in the Joko Tarub Forest Tuban

Yudhistian , Dede Nuraida , Susi Novita Sari , Fitriatus Sholikah

936-944

DOI: 10.29303/jppipa.v11i4.10974

Optimization of Tetrigona apicalis Propolis Extract using Glycerol Solvent with Shaking Ultrasound Assisted Extraction Method

Dwi Desmiyeni Putri , Syahdilla Anggiva Akhni Rarasati , Oktaf Rina , Isnina

945-951

DOI: 10.29303/jppipa.v11i4.10466

Seismic Attenuation Characteristics in Sumba Island Based on Coda Wave Analysis

Ayu Puput Ariyanti , Titi Anggono , Aditya Dwi Prasetio , Kartika Hajar Kirana

952-963

DOI: 10.29303/jppipa.v11i4.10870

Statistics: 150 | 112

Citations 0

PDV

Analysis of Electric Field Intensity in Residential Areas Due to Lightning Strikes on Base Transceiver Station Towers

Ni Made Seniari , Supriyatna , Abdul Natsir , Ida Ayu Sri Adnyani , I Made Ginarsa , Muh. Sultanul Mahdi , Haidar Hamdi , Bagus Widhi Dharma S

964-972

DOI: 10.29303/jppipa.v11i4.8550
Statistics: 54 | 68

Citations 0

PDV

The Relationship Between Communication Skills and Student Learning Activities with the IPAS Learning Outcomes of Grade IV Elementary School Students

Hasna Luthfiyah , Eka Titi Andaryani

973-978

DOI: 10.29303/jppipa.v11i4.10960
Statistics: 81 | 39

Citations 0

PDV

Science Flipbook Media on Elementary School Students' Learning Outcomes

Rima Devita Sari , Ana Fitrotun Nisa , Akbar Al Masjid , Banun Havifah Cahyo Khosiyono

979-986

DOI: 10.29303/jppipa.v11i4.10308
Statistics: 58 | 37

Citations 0

PDV

Implementation of Project-Based Learning and Critical Thinking on Students' Learning Outcomes

Yuda Ganda Putra , Yayat Ruhiat , Lukman Nulhakim , Endang Iryani

987-995

DOI: 10.29303/jppipa.v11i4.10525
Statistics: 78 | 47

Citations 0

PDV

Development of Interactive Chemistry Activity Book on Hydrocarbon Topics

Nicholas Noel Ferdiansyah , Natalia Diyah Hapsari

996-1002

DOI: 10.29303/jppipa.v11i4.7587
Statistics: 36 | 32

Citations 0

PDV

Students' Perception Toward the Utilization of Tiktok as Vocabulary Learning Media

Mikhael Parlindungan Hutasoit , Margana , Yuyun Yulia , Hillario Satria

1003-1010

DOI: 10.29303/jppipa.v11i4.10637
Statistics: 64 | 67

Citations 0

PDV

Assessment on Medowo Village Kandangan District, Kediri Regency as

Biogas Based Energy Independent Village

Wahyu Devi Hapsari Wijayanti , Surjono , Hartati Kartikaningsih

1011-1022

DOI: 10.29303/jppipa.v11i4.10172

Development of Flipbook Assisted by Augmented Reality Media on Human Respiratory System Subject of IPAS in Grade V Elementary School

Ilma Yang Fauni , Barokah Isdaryanti

1023-1029

DOI: 10.29303/jppipa.v11i4.10841

Mapping Potential Habitat Characteristics and Identification of Migratory Raptor Species in the Sabang City

Dhea Rhamadini , Aida Fithri , Wira Dharma , Heri Tarmizi

1030-1038

DOI: 10.29303/jppipa.v11i4.10078

Identification of Remote Sensing Data: NDVI, LST, and LULC on Geothermal Manifestations in Bondowoso Regency

Linggar Ayu Octaviani , Bowo Eko Cahyono , Agus Suprianto

1039-1046

DOI: 10.29303/jppipa.v11i4.9620

Air Management in Chemistry Laboratories to Prevent Sick Building Syndrome (SBS): A Mixed-Method Approach

Abdurrasyid , Helmi Geisfarad , Rian Adi Pamungkas , Aprilita Rina Yanti , Duan Elnastio , Diman Wahyudin

1047-1058

DOI: 10.29303/jppipa.v11i4.10799

Innovative Alternative Zinc Supplementation for Stunted Children from Pumpkin Seeds in the Form of Gummy Candy

Chitra Astari , Al Syahril Samsi , Waode Suiyarti , Sunarto S , Asmila

1059-1063

DOI: 10.29303/jppipa.v11i4.11017

Student Activeness in Problem Solving Ability Based Learning on Magnet Material

Shinta Syafitri , Yanti Fitria

1064-1069

DOI: 10.29303/jppipa.v11i4.9985

Innovation in the Design and Manufacture of Rice Fan Tools

Oknovia Susanti , Rizki Afriansyah , Fuadil Fajri Rozali , Yulinda , Hendri Yanda

1070-1077

DOI: 10.29303/jppipa.v11i4.10574
Statistics: 50 | 38

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Evaluation of General Bioactive Phytochemicals, Antioxidant Activity, and Organoleptic Properties of Ficus racemosa L. as Herbal Tea

Novia Suryani , Yuli Kusuma Dewi , Baiq Rauhil Hidayanti

1078-1088

DOI: 10.29303/jppipa.v11i4.11024
Statistics: 88 | 37

PDV

Science Study of Transportation Infrastructure on Energy Consumption and its Impact on Economic Growth in Aceh Province

Teuku Faiz Kamal , Muhammad Irfan

1089-1093

DOI: 10.29303/jppipa.v11i4.10897
Statistics: 48 | 27

PDV

Exploring Individual Experiences in Understanding Environmental Policies: A Phenomenological Approach to Urban Communities

Ayub Kasim , Irman Halid , Asriana Abdullah , Ince Rahmah Ismail

1094-1101

DOI: 10.29303/jppipa.v11i4.10890
Statistics: 80 | 30

PDV

Preliminary Analysis of Students' Problem Solving Ability and Self-Efficacy in IPAS Subject at Community Learning Center (CLC) Sabah Malaysia

Kemampuan Pemecahan Masalah dan Efikasi Diri

Anisa Vita Vela , Novi Ratna Dewi , Sri Sukaesih

1102-1107

DOI: 10.29303/jppipa.v11i4.10154
Statistics: 75 | 41

PDV

Understanding Elderly Health in Riau: Phenomenology Study on Healthcare Access, Chronic Diseases, and Care Challenges

Gusman Virgo , Indrawati , Sri Hardianti

1108-1115

DOI: 10.29303/jppipa.v11i4.10937
Statistics: 57 | 50

PDV

Quasi-Experimental Investigation of Nutritional Interventions and Cognitive Advancement in Stunted Children

Dewi Anggriani Harahap , Fitri Apriyanti , Syukrianti Syahda , Armiyati Nur , Mustika Hana Harahap

1116-1123

DOI: 10.29303/jppipa.v11i4.10973
Statistics: 117 | 69

PDV

Development of STEM-Based E-Module to Enhance Science Literacy and Science Process Skills in Chemistry Learning

Seget Tartiyoso 1124-1132

DOI: 10.29303/jppipa.v11i4.10844
Statistics: 66 | 56

PDV

The Morphological Character and Flowering Phenology of White Jasmine (Jasminum sambac (L.) Aiton)

Fadilah Khoirunnisa , Pinta Murni , M. Erick Sanjaya 1133-1140

DOI: 10.29303/jppipa.v11i4.10908
Statistics: 63 | 63

PDV

The Effect of Organic Fertilisers on Arbuscular Mycorrhizal Fungi Diversity in the Rizhosphere of Coffea arabica Plants on the Napu Highland, Central Sulawesi, Indonesia

Annadira , Yusran , Wardah , Imran Rachman , Abdul Hadid 1141-1149

DOI: 10.29303/jppipa.v11i4.11044
Statistics: 53 | 45

PDV

Development of an Integrated Helminthiasis Prevention Education Model in Elementary Schools: Utilizing Picture Storybooks and Storytelling as Learning Media

Armaidi Darmawan , Ahmad Syauqy , Andika Sulistiawan , Wahyu Indah Dewi Aurora , Erny Kusdiyah 1150-1158

DOI: 10.29303/jppipa.v11i4.10883
Statistics: 73 | 33

PDV

Key Predictors of Quality of Life Among the Elderly in Kampar regency: A Multidimensional Approach

Indrawati , Gusman Virgo , Putri Eka Sudiarti 1159-1168

DOI: 10.29303/jppipa.v11i4.11005
Statistics: 61 | 66

PDV

Analysis of the Use of Provider and Mi-Fi Devices on Game Performance in Mobile Legends: Bang Bang Ranked Mode

Maulana Ridho Alfarizqa , Made Sutha Yadnya , Abdullah Zainuddin 1169-1178

DOI: 10.29303/jppipa.v11i4.10429
Statistics: 92 | 87

PDV

Application of The Marketing Mix Model in Consumer Behavior Analysis and Its Educational Implications: Case Study of Specialty Organic Coffee at Waroeng Kopi Kayumas

Nia Rahmi Setiawati , Abdul Wahib Muhaimin , Agustina Shinta Hartati Wahyuningtyas
1179-1189

DOI: 10.29303/jppipa.v11i4.10063
Statistics: 43 | 27

Citations 0

PDV

The Effect of Problem-Based Learning in Biophysics on Science Education Students' Critical Thinking Skills

Muhammad Andika Putra , Madlazim Madlazim , Eko Hariyono , Mohammad Budiyanto
1190-1194

DOI: 10.29303/jppipa.v11i4.6688
Statistics: 67 | 69

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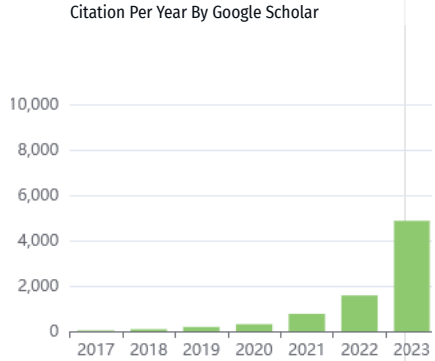

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The Relationship of Stress Levels to Noise Exposure
Postgraduate, University of Mataram Jurnal Penelitian Pendidikan IPA Vol 11 No 5 (2025): May 890-894
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Postgraduate, University of Mataram Jurnal Penelitian Pendidikan IPA Vol 11 No 5 (2025): May 882-889
2025 DOI: 10.29303/jppipa.v11i5.11552 Accred : Sinta 2

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Postgraduate, University of Mataram Jurnal Penelitian Pendidikan IPA Vol 11 No 5 (2025): May 1019-1028
2025 DOI: 10.29303/jppipa.v11i5.11472 Accred : Sinta 2

Analysis of Science Literacy and Environmental Awareness of Elementary School Students Through the Use of STEM-Based Solar Sprinkle and Ecoburn Media in Science Learning
Postgraduate, University of Mataram Jurnal Penelitian Pendidikan IPA Vol 11 No 5 (2025): May 274-281
2025 DOI: 10.29303/jppipa.v11i5.11470 Accred : Sinta 2

The Effect of The Jigsaw Type Cooperative Learning Model Integrated with The Mind Mapping Technique on The Motivation and Learning Outcomes of Elementary School

Students in Grade V

Postgraduate, University of Mataram Jurnal Penelitian Pendidikan IPA Vol 11 No 5 (2025): May 550-556

2025 DOI: 10.29303/jppipa.v11i5.11438 Accred : Sinta 2

Implementation of Convolutional Neural Network (CNN) Method in Determining the Level of Ripeness of Mango Fruit Based on Image

Postgraduate, University of Mataram Jurnal Penelitian Pendidikan IPA Vol 11 No 5 (2025): May 419-428

2025 DOI: 10.29303/jppipa.v11i5.11436 Accred : Sinta 2

Content Validity Analysis of a Virtual Reality Based Two-Tier Multiple Choice Assessment Instrument with Ethnochemistry to Early Detect Misconceptions in Reaction Rate Topics

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2025 DOI: 10.29303/jppipa.v11i5.11429 Accred : Sinta 2

Neuroscience Analysis in Helping Students with Dyscalculia Understand Mathematics

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2025 DOI: 10.29303/jppipa.v11i5.11418 Accred : Sinta 2

Modeling and Optimization of Increasing Teacher Innovativeness Based on Local Wisdom and Technological Literacy

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2025 DOI: 10.29303/jppipa.v11i5.11406 Accred : Sinta 2

Analysis of the Quality of the Physical Environment of the House on the Incidence of Tuberculosis in Tembalang Subdistrict

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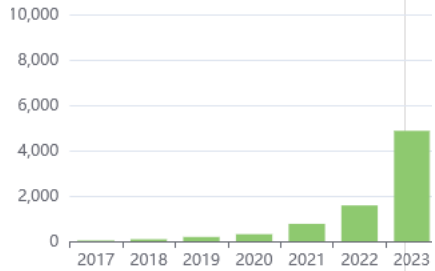

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