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# UJI INSTRUMENTS DATA

## a. Uji Validitas Instrumen

|  |
| --- |
| **Correlations** |
|  | Soal01 | Soal02 | Soal03 | Soal04 | Soal05 | Soal06 | Soal07 | Total Skor |
| Soal01 | Pearson Correlation | 1 | .276 | .323 | .085 | .101 | .215 | .127 | .413\* |
| Sig. (2-tailed) |  | .133 | .077 | .648 | .591 | .246 | .494 | .021 |
| N | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| Soal02 | Pearson Correlation | .276 | 1 | .363\* | .389\* | .437\* | .291 | .357\* | .653\*\* |
| Sig. (2-tailed) | .133 |  | .045 | .031 | .014 | .112 | .049 | .000 |
| N | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| Soal03 | Pearson Correlation | .323 | .363\* | 1 | .127 | .229 | .361\* | .617\*\* | .785\*\* |
| Sig. (2-tailed) | .077 | .045 |  | .497 | .215 | .046 | .000 | .000 |
| N | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| Soal04 | Pearson Correlation | .085 | .389\* | .127 | 1 | .216 | .079 | .181 | .401\* |
| Sig. (2-tailed) | .648 | .031 | .497 |  | .243 | .674 | .329 | .025 |
| N | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| Soal05 | Pearson Correlation | .101 | .437\* | .229 | .216 | 1 | .137 | .320 | .459\*\* |
| Sig. (2-tailed) | .591 | .014 | .215 | .243 |  | .461 | .079 | .009 |
| N | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| Soal06 | Pearson Correlation | .215 | .291 | .361\* | .079 | .137 | 1 | .515\*\* | .665\*\* |
| Sig. (2-tailed) | .246 | .112 | .046 | .674 | .461 |  | .003 | .000 |
| N | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| Soal07 | Pearson Correlation | .127 | .357\* | .617\*\* | .181 | .320 | .515\*\* | 1 | .819\*\* |
| Sig. (2-tailed) | .494 | .049 | .000 | .329 | .079 | .003 |  | .000 |
| N | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| TotalSkor | Pearson Correlation | .413\* | .653\*\* | .785\*\* | .401\* | .459\*\* | .665\*\* | .819\*\* | 1 |
| Sig. (2-tailed) | .021 | .000 | .000 | .025 | .009 | .000 | .000 |  |
| N | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| \*. Correlation is significant at the 0.05 level (2-tailed). |
| \*\*. Correlation is significant at the 0.01 level (2-tailed). |

## b. Uji Reliabilitas

|  |
| --- |
| **Reliability Statistics** |
| Cronbach's Alpha | N of Items |
| .723 | 7 |

# ANALISIS DATA

## 1. UJI PRASAYRAT PENELITIAN

### a. Uji Normalitas menggunakan *Kolmogorov Smirnov*

|  |
| --- |
| **Tests of Normality** |
|  | Kelas | Kolmogorov-Smirnova | Shapiro-Wilk |
|  | Statistic | df | Sig. | Statistic | df | Sig. |
| Nilai Siswa | 1 | .131 | 36 | .119 | .933 | 36 | .030 |
| 2 | .121 | 36 | .200\* | .960 | 36 | .217 |
| \*. This is a lower bound of the true significance. |
| a. Lilliefors Significance Correction |

### b. Uji Homogenitas menggunakan Levene’s test for equality of variences

|  |
| --- |
| **Test of Homogeneity of Variances** |
|  | Levene Statistic | df1 | df2 | Sig. |
| Nilai Siswa | Based on Mean | .810 | 1 | 70 | .371 |
| Based on Median | .650 | 1 | 70 | .423 |
| Based on Median and with adjusted df | .650 | 1 | 67.828 | .423 |
| Based on trimmed mean | .747 | 1 | 70 | .390 |

## 2. UJI HIPOTESIS

### a. Uji Hipotesis menggunakan *Independent sample t-test*

|  |
| --- |
| **Independent Samples Test** |
|  | Levene's Test for Equality of Variances | t-test for Equality of Means |
| F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |
| Lower | Upper |
| Nilai Siswa | Equal variances assumed | 0,810 | 0,371 | 2,083 | 70 | 0,041 | 8,056 | 3,867 | 0,343 | 15,768 |
| Equal variances not assumed |   |   | 2,083 | 68,494 | 0,041 | 8,056 | 3,867 | 0,340 | 15,771 |

# NILAI POST-TEST KELAS EKSPERIMEN

Kelas : XI C

Materi : Kebencanaan dan Lingkungan Hidup

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **NIS** | **Nama Siswa** | Nilai |
|  |
| 1 | 6543 | AZELYA FATIHAH MAKSUM | 70 |  |
| 2 | 6551 | BAIQ JIHAN KUSUMA | 65 |  |
| 3 | 6552 | BENNY FATKHURROHMAN | 80 |  |
| 4 | 6556 | BISMA ATMAJA KURNIAWAN | 100 |  |
| 5 | 6557 | BRILLIANT FADHILLAH ARYA W | 75 |  |
| 6 | 6577 | DHIMACE ANDHIKA CHANIAGO | 100 |  |
| 7 | 6589 | EKA AFRILIA PUTRI | 95 |  |
| 8 | 6593 | F. CANTING ARUM MUTIANIRANI (KK) | 90 |  |
| 9 | 6601 | FARREL SINATHRYA ANANDA L | 85 |  |
| 10 | 6603 | FATHAN ALDRIN RAHMAN | 75 |  |
| 11 | 6607 | FELYSA ALMAIRA ZULFI AURELIA | 90 |  |
| 12 | 6627 | ILHAM NUR RAMADHANA | 95 |  |
| 13 | 6629 | ISNAEN FAJAR DHARMAWAN | 70 |  |
| 14 | 6641 | KARLA AURA DAYANARA | 90 |  |
| 15 | 6656 | LINGGA CHUIS SOCHAYANA | 80 |  |
| 16 | 6676 | MESYA HUSNA AZ-ZAHRA | 50 |  |
| 17 | 6691 | MUHAMAD FAUZAN SYARIF H | 95 |  |
| 18 | 6683 | MUHAMMAD AKMAL HAFIZ ABHYASA | 70 |  |
| 19 | 6687 | ESTERINA AGUSTIN | 85 |  |
| 20 | 6698 | MUHAMMAD LUNGGUHNE PANGESTU | 75 |  |
| 21 | 6707 | MUHAMMAD RIDHO ARMAN M | 60 |  |
| 22 | 6705 | MUHAMMAD RANADHIRASWARA | 90 |  |
| 23 | 6713 | MUTIARA NAFFISA PUTRI BASTOMI | 75 |  |
| 24 | 6716 | NABILAH PUTRI SYAFTARI | 80 |  |
| 25 | 6740 | NI PUTU AZZAHRA ARGITA M | 100 |  |
| 26 | 6749 | PUTRI ANDIKA SARI | 90 |  |
| 27 | 6750 | PUTRI NABILA ROSA | 80 |  |
| 28 | 6754 | RACHEL YUSMINA RISTI MARTA A  | 50 |  |
| 29 | 6760 | RADITYA SANDY SHAFWANSYAH | 40 |  |
| 30 | 6766 | RAHAGI NOHAN NAGATA (H) | 60 |  |
| 31 | 6787 | RR. FIONA DIAN PERMATA | 85 |  |
| 32 | 6796 | SANDY WIRA SETIAWAN | 90 |  |
| 33 | 6808 | SIWI JILAN RAMADHANI | 100 |  |
| 34 | 6816 | TARIESYA FEBI ANABIELA | 80 |  |
| 35 | 6819 | TREADILA WARIH PUSPA RINI | 75 |  |
| 36 | 6838 | ZHEVA MAHEZA AL FADHILAH | 95 |  |
| Rata-rata | 80,14 |  |

# NILAI POST-TEST KELAS KONTROL

Kelas : XI D

Materi : Kebencanaan dan Lingkungan Hidup

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **NIS** | **Nama Siswa** | Nilai |
|  |
| 1 | 6496 | AHMAD RAKHA' MAULANA | 30 |  |
| 2 | 6501 | AKHSANU YUHIBBUL | 75 |  |
| 3 | 6507 | ALMA KEISHYA PUTRI YARIANSYAH | 90 |  |
| 4 | 6526 | ARDIANSYAH ABIRAWA RAMADHAN | 65 |  |
| 5 | 6532 | AULIA SHEVA RAFSANJANI | 80 |  |
| 6 | 6544 | AZKA AHYA PUSPITA | 85 |  |
| 7 | 6553 | BETO SAMALLO (KP) | 45 |  |
| 8 | 6571 | DAMA MAHRUSADANA | 80 |  |
| 9 | 6580 | DIMAS FIRZA FIRANSYAH | 85 |  |
| 10 | 6590 | EL RASYADIAN PUTRA ZAMIL | 100 |  |
| 11 | 6591 | ELANG SURYA ASMORO | 50 |  |
| 12 | 6596 | FAJAR ATHAILLAH SASONGKOJATI | 90 |  |
| 13 | 6597 | FANDIRAYHAN RAFANSYAH | 65 |  |
| 14 | 6608 | FIRMANIAL RAMADHAN | 60 |  |
| 15 | 6614 | GERRARD ANDHIKA SATRIYA F (KP) | 65 |  |
| 16 | 6626 | ILHAM AUFAR | 100 |  |
| 17 | 6652 | KRISNA AJI DHARMA JATI | 50 |  |
| 18 | 6679 | MOCHAMMAD DICKY DARMAWAN | 75 |  |
| 19 | 6680 | MOHAMMAD FAIS YAHYA | 70 |  |
| 20 | 6688 | MUHAMMAD ATHAYA ABBY ABBAS | 70 |  |
| 21 | 6690 | MUHAMMAD FAIZ IKBAR PANDAWA | 60 |  |
| 22 | 6696 | MUHAMMAD KEVI AKBAR | 40 |  |
| 23 | 6697 | MUHAMMAD KHOTAMY ZADA EL S | 65 |  |
| 24 | 6702 | MUHAMMAD RAIHAN DAFFA KURNIA | 65 |  |
| 25 | 6725 | NAFISAH ANANDITA BOEDIONO | 90 |  |
| 26 | 6738 | NERISSA ANDREA PURNAMA SARI | 85 |  |
| 27 | 6755 | RADHITYA ARIEL RAMADHAN | 65 |  |
| 28 | 6757 | RADHITYA NARENDRA KUSUMA | 75 |  |
| 29 | 6765 | RAFIKA DEWI PERMATASARI | 75 |  |
| 30 | 6768 | RAIHAN BIAMRILLAH | 70 |  |
| 31 | 6769 | RAIHAN ZAKI SANJAYA PUTRA | 100 |  |
| 32 | 6789 | SABRINA BARBIE AZ-ZAHRA | 90 |  |
| 33 | 6812 | SYAFRI FARREL CHOIRINO W | 75 |  |
| 34 | 6814 | TALITA TANJUNG | 40 |  |
| 35 | 6818 | TERTIATA ANINDYA PUTRI | 80 |  |
| 36 | 6839 | ZORA LUVIAN RAMADHAN | 90 |  |
| Rata-rata | 72,08 |  |

# NILAI PER INDIKATOR KEMAMPUAN BERPIKIR SPASIAL

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Spatial Thinking Ability Indicator | Spatial Thinking Ability Level | Sub Indicators | Experiment Class | Control Class |
| Space Concept  | *Spatial Primitives* | Location | 80,56 | 83,33 |
| *Simple Spatial* | Identifying the Region | 75 | 75 |
| *Complex Spatial* | *Spatial Association* | 84,02 | 65,97 |
| Representation Tool | *Use* | Identifying the Content of Aerial Imagery Photos | 81,94 | 77,78 |
| Reasoning Process | *Input* | Elaborate | 80,56 | 86,11 |
|  | *Processing* | Analysis | 79,62 | 73,14 |
|   | *Output* | *Plan* | 78,47 | 59,02 |

# HASIL ANALISIS DATA

Table 1. Average Post-test Score of Spatial Thinking Ability

|  |  |  |
| --- | --- | --- |
| Parameters | *Science, Environment,**Technology and Society* Integrated with *Google Earth Model* | Conventional Model |
| Number of Students | 36,00 | 36,00 |
| Average | 80,14 | 72,08 |

Based on Table 1. The mean difference in *post-test* scores between the experimental class and control classes was 8.06. This suggests that students in the experimental group, who were taught using the *Science, Environment, Technology, and Society* (SETS) integrated with the *Google Earth* learning model, had significantly higher spatial thinking abilities. The research data were further analyzed to test the hypothesis of the study. Parametric statistics, specifically the *independent sample t-test,* were used for the analysis, with the assistance of SPSS 25 for Windows. The results of the *T-Test* analysis are presented below.

Table 2. *Independent Sample T-Test*

|  |  |
| --- | --- |
| Post-test ScoreSpatial Thinking Ability | *T-Test  for Equality of Means* |
| *Equal Variances Assumed* | t | df | Sig. (2-tailed) |
|  |  |  |
| 2.083 | 70 | .041 |

In Table 2. Present the *posttest data on students’* spatial thinking ability, with a Sig. (*2-tailed*) value of 0,041, which is less than 0,05. This indicates that the H0 is rejected and H1 is accepted. Therefore, it can be concluded that the Sig. (*2-tailed*) is smaller than 0.05 and *the mean of the* experimental class is higher than the *mean of the* control class*,* then the *Science, Environment, Technology, and Society* (SETS) model integrated with *Google Earth* affects students' spatial thinking ability. The SETS learning model integrated with *Google Earth* becomes a fully progressive strategy by combining knowledge, environmental conditions, the use of technology, and community activities in Geography learning. Activities in the SETS learning model integrated with *Google Earth* can help students interpret ideas and ideas in real conditions to improve spatial thinking Ability.

Table 3 *Post-test* Based on Spatial Thinking Ability Indicator

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Spatial Thinking Ability Indicator | Spatial Thinking Ability Level | Sub Indicators | Experiment Class | Control Class |
| Space Concept  | *Spatial Primitives* | Location | 80,56 | 83,33 |
| *Simple Spatial* | Identifying the Region | 75 | 75 |
| *Complex Spatial* | *Spatial Association* | 84,02 | 65,97 |
| Representation Tool | *Use* | Identifying the Content of Aerial Imagery Photos | 81,94 | 77,78 |
| Reasoning Process | *Input* | Elaborate | 80,56 | 86,11 |
|  | *Processing* | Analysis | 79,62 | 73,14 |
|   | *Output* | *Plan* | 78,47 | 59,02 |

Table 3 presents the spatial thinking ability scores per indicator for the experimental class. The indicator with the highest score in the experimental class is, "*Complex Spatial* in the form of *Spatial Association*". This indicator is the core concept of spatial thinking ability, where students can understand specific areas in the vicinity of natural disasters. By considering technological advancements and the morphological conditions of disaster-prone areas, students can formulate disaster mitigation strategies in accordance with the *disaster management cycle* concept, which includes the phases of *disaster, response, rehabilitation, reconstruction, recovery, development, prevention, mitigation,* and *preparedness.* The scores on the other indicators also show that the experimental class scores are higher than the control class, and some indicators have quite a high difference. The low scores of the control class compared to the experimental class may be due to the fact the control class students are still unable to grasp the main keywords in the answer key, while the experimental class students can answer questions completely, more innovatively, and precisely.