ProPla rstats

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# Pamagat

Kaugnayan ng Demograpikong Propayl sa mga Platform at Estratehiya sa Pagkatuto ng mga Piling Estudyante ng Nueva Vizcaya State University

# Paglalahad ng Layunin

Ang pananaliksik na ito ay naglalayong tukuyin ang kagamitan at estratehiya sa pagkatuto ng mga estudyante sa Nueva Vizcaya State University Bayombong Campus. Nilalayon nitong:

1. Matukoy ang demograpikong propayl ng mga estudyante sa 1st year.
2. Matukoy ang mga platforms na ginagamit ng mga tagatugon.
3. Matukoy ang mga estratehiya na ginagamit ng mga tagatugon.
4. Matukoy ang kaugnayan ng demograpikong propayl at platforms sa estratehiya sa pagkatuto ng mga estudyante.

# Notes

1. Negative statements
   * None

# Load Libraries

library(tidyverse)

── Attaching core tidyverse packages ──────────────────────── tidyverse 2.0.0 ──  
✔ dplyr 1.1.2 ✔ readr 2.1.4  
✔ forcats 1.0.0 ✔ stringr 1.5.0  
✔ ggplot2 3.4.2 ✔ tibble 3.2.1  
✔ lubridate 1.9.2 ✔ tidyr 1.3.0  
✔ purrr 1.0.1   
── Conflicts ────────────────────────────────────────── tidyverse\_conflicts() ──  
✖ dplyr::filter() masks stats::filter()  
✖ dplyr::lag() masks stats::lag()  
ℹ Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors

library(readxl)  
library(gt)  
library(rstatix)

Attaching package: 'rstatix'  
  
The following object is masked from 'package:stats':  
  
 filter

library(broom)  
library(likert)

Loading required package: xtable  
  
Attaching package: 'likert'  
  
The following object is masked from 'package:dplyr':  
  
 recode

library(car)

Loading required package: carData  
  
Attaching package: 'car'  
  
The following object is masked from 'package:likert':  
  
 recode  
  
The following object is masked from 'package:dplyr':  
  
 recode  
  
The following object is masked from 'package:purrr':  
  
 some

# Import Data

propla <- read\_excel("data/propla.xlsx")  
propla <- tibble(propla)  
  
plat <- read\_csv("data/plat.csv", show\_col\_types = FALSE)  
plat <- tibble(plat)

# Tidying and Transforming Data

propla <- propla |>  
 rowwise() |>  
 mutate(s\_mean = mean((c\_across(S1:S15)), na.rm = T)) |>  
 ungroup()  
  
propla <-  
 propla |>  
 mutate\_at(vars(c(BKP, Platform)), as.character) |>  
 mutate\_at(vars(c(Edad, BKP, Platform)), factor) |>  
 mutate(Edad = factor(Edad, levels = c("X", "Y", "Z"))) |>  
 mutate(BKP = factor(BKP, levels = c("1", "2", "3", "4"))) |>  
 mutate(Platform = factor(Platform,  
 levels = c("1", "2", "3", "4", "5")))

# Objective 1

propla |>  
 count(Kolehiyo) |>  
 mutate(  
 percent = round((n / sum(n))\*100, digits = 2)  
 ) |>  
 gt()

| Kolehiyo | n | percent |
| --- | --- | --- |
| CA | 34 | 9.80 |
| CAS | 76 | 21.90 |
| CBE | 32 | 9.22 |
| CFERM | 33 | 9.51 |
| CHE | 34 | 9.80 |
| COE | 54 | 15.56 |
| CTE | 68 | 19.60 |
| CVM | 16 | 4.61 |

propla |>  
 count(Kasarian) |>  
 mutate(  
 percent = round((n / sum(n))\*100, digits = 2)  
 ) |>  
 gt()

| Kasarian | n | percent |
| --- | --- | --- |
| F | 151 | 43.52 |
| M | 196 | 56.48 |

propla |>  
 count(Edad) |>  
 mutate(  
 percent = round((n / sum(n))\*100, digits = 2)  
 ) |>  
 gt()

| Edad | n | percent |
| --- | --- | --- |
| X | 143 | 41.21 |
| Y | 118 | 34.01 |
| Z | 86 | 24.78 |

propla |>  
 count(Kurso) |>  
 arrange(n) |>  
 mutate(  
 percent = round((n / sum(n))\*100, digits = 2)  
 ) |>  
 gt()

| Kurso | n | percent |
| --- | --- | --- |
| BSTM | 1 | 0.29 |
| BSTM-FM | 1 | 0.29 |
| BECED | 2 | 0.58 |
| BSHT | 2 | 0.58 |
| BSTM-FN | 3 | 0.86 |
| COMSCI | 3 | 0.86 |
| BSMATH | 4 | 1.15 |
| BTVTED | 4 | 1.15 |
| BEED | 5 | 1.44 |
| BPED | 5 | 1.44 |
| BSBA-BE | 5 | 1.44 |
| BSES-EM | 6 | 1.73 |
| BSHT-FN | 6 | 1.73 |
| BSF | 7 | 2.02 |
| BSIBIO-MED | 7 | 2.02 |
| BSBA-HRM | 8 | 2.31 |
| BSABE | 9 | 2.59 |
| BSBA-MM | 9 | 2.59 |
| BSECO | 9 | 2.59 |
| BSBA-FM | 10 | 2.88 |
| BSAF | 11 | 3.17 |
| BSGE | 13 | 3.75 |
| BCAED | 15 | 4.32 |
| BAS | 16 | 4.61 |
| BSBIO-MED | 18 | 5.19 |
| BSCS | 19 | 5.48 |
| BSHM | 21 | 6.05 |
| BSIT | 25 | 7.20 |
| BSCE | 32 | 9.22 |
| Certificate of Agriculutral Science | 34 | 9.80 |
| BSED | 37 | 10.66 |

propla |>  
 count(SHS) |>  
 arrange(n) |>  
 mutate(  
 percent = round((n / sum(n))\*100, digits = 2)  
 ) |>  
 gt()

| SHS | n | percent |
| --- | --- | --- |
| Aldersgate College | 1 | 0.29 |
| Amondo Cope College | 1 | 0.29 |
| Araulo University | 1 | 0.29 |
| Army's Angel Integrated School | 1 | 0.29 |
| BBGNHS | 1 | 0.29 |
| Ballugisi National Highschool | 1 | 0.29 |
| Bunga Integrated High School | 1 | 0.29 |
| Busilac National High School | 1 | 0.29 |
| Cagayan Valley Computer and ITC | 1 | 0.29 |
| Calili National High School | 1 | 0.29 |
| Callang National High School | 1 | 0.29 |
| Canabuan National Highschool | 1 | 0.29 |
| Capintalan National High School | 1 | 0.29 |
| Carranglan National High School | 1 | 0.29 |
| Central Isabela Christian Academy | 1 | 0.29 |
| Dabubu National Highschool | 1 | 0.29 |
| Diadi Region Highschool | 1 | 0.29 |
| Diffun National High School | 1 | 0.29 |
| Dippog National High School | 1 | 0.29 |
| Don Jose Inares Memorial High School | 1 | 0.29 |
| Dupax Del Sur Natioanal High School | 1 | 0.29 |
| Eastern Nueva Vizcaya National High School | 1 | 0.29 |
| Ganao National High School | 1 | 0.29 |
| Hapid National High School | 1 | 0.29 |
| Hungduan National High School | 1 | 0.29 |
| Ifugao Provincial Senior High School | 1 | 0.29 |
| Ilocos Norte Agricultural Collge | 1 | 0.29 |
| Kapintalan National High School | 1 | 0.29 |
| La Patria College | 1 | 0.29 |
| La Sallete of Ramon | 1 | 0.29 |
| MVNHS | 1 | 0.29 |
| Maddela Conprehensive National High School | 1 | 0.29 |
| Mungia National High Scool | 1 | 0.29 |
| Nueva Vizcaya Institute | 1 | 0.29 |
| Palma National Highschool | 1 | 0.29 |
| Philippine College of Criminology | 1 | 0.29 |
| Runruno | 1 | 0.29 |
| SABNHS | 1 | 0.29 |
| SMNHS | 1 | 0.29 |
| SUNHS | 1 | 0.29 |
| Saint Joseph School | 1 | 0.29 |
| Saint Josepth School | 1 | 0.29 |
| Saint Jude Parish School Inc. | 1 | 0.29 |
| Saint Louis School | 1 | 0.29 |
| Saint Luis School | 1 | 0.29 |
| Saint MAry's University | 1 | 0.29 |
| San Roque National High School | 1 | 0.29 |
| Scala Integrated School | 1 | 0.29 |
| Sister's of Mary School | 1 | 0.29 |
| Sta.Cruz Pinkian National High School | 1 | 0.29 |
| TVTSMA | 1 | 0.29 |
| Tarlac National High School | 1 | 0.29 |
| Tinoc National High School | 1 | 0.29 |
| Uddiawan National High School | 1 | 0.29 |
| Valley High Academy | 1 | 0.29 |
| solano High School | 1 | 0.29 |
| Assumption Academy of Mayoyao Inc. | 2 | 0.58 |
| Diadi Region High School | 2 | 0.58 |
| Dupax Del Norte National Highschool | 2 | 0.58 |
| Dupax Del Sur National High School | 2 | 0.58 |
| Haliap Senior High School | 2 | 0.58 |
| Kayapa National High School | 2 | 0.58 |
| Lamo National High School | 2 | 0.58 |
| Munguia National Hig School | 2 | 0.58 |
| Nansiakan National High School | 2 | 0.58 |
| Nueva Vizvaya General Comprehensive High School | 2 | 0.58 |
| PLT | 2 | 0.58 |
| Sta. Maria National High School | 2 | 0.58 |
| Victoria National High School | 2 | 0.58 |
| Wigan Integrated School | 2 | 0.58 |
| Bascaran National Highschool | 3 | 0.86 |
| Cabarrouguis National High School | 3 | 0.86 |
| Diadi National High School | 3 | 0.86 |
| Don Bosco National High School | 3 | 0.86 |
| Kakiduguen National High School | 3 | 0.86 |
| Paima National High School | 3 | 0.86 |
| Runruno National High School | 3 | 0.86 |
| Saint Teresita Academy | 3 | 0.86 |
| Santa Fe National High School | 3 | 0.86 |
| Abuyo National High School | 4 | 1.15 |
| Ambagiou National High School | 4 | 1.15 |
| Ambaguio National High School | 4 | 1.15 |
| Immaculate Conceptions | 4 | 1.15 |
| Kings Collge Of The Philippines | 4 | 1.15 |
| Our Lady of Fatima School of Villaverde | 4 | 1.15 |
| Quezon National Highschool | 4 | 1.15 |
| Bagabag National High School | 5 | 1.44 |
| Kongkong Valley National High School | 5 | 1.44 |
| Saint Jerome Academy | 5 | 1.44 |
| Casat National High School | 6 | 1.73 |
| Maddela Comprehensive National High School | 6 | 1.73 |
| Saint Catherin School | 6 | 1.73 |
| Bambang National High School | 7 | 2.02 |
| Kasibu National Agricultural School | 8 | 2.31 |
| Murong National High School | 9 | 2.59 |
| Saint Mary's University | 10 | 2.88 |
| Bintawan National High School | 12 | 3.46 |
| Solano High School | 15 | 4.32 |
| Bonfal National High School | 18 | 5.19 |
| Aritao National High School | 22 | 6.34 |
| Nueva Vizcaya General Comprehensive High School | 74 | 21.33 |

propla |>  
 count(Type) |>  
 mutate(  
 percent = round((n / sum(n))\*100, digits = 2)  
 ) |>  
 gt()

| Type | n | percent |
| --- | --- | --- |
| ABC | 284 | 81.84 |
| XYZ | 63 | 18.16 |

propla |>  
 count(BKP) |>  
 mutate(  
 percent = round((n / sum(n))\*100, digits = 2)  
 ) |>  
 gt()

| BKP | n | percent |
| --- | --- | --- |
| 1 | 157 | 45.24 |
| 2 | 111 | 31.99 |
| 3 | 58 | 16.71 |
| 4 | 21 | 6.05 |

# Objective 2

propla |>  
 count(Platform) |>  
 mutate(  
 percent = round((n / sum(n))\*100, digits = 2)  
 ) |>  
 gt()

| Platform | n | percent |
| --- | --- | --- |
| 1 | 49 | 14.12 |
| 2 | 151 | 43.52 |
| 3 | 141 | 40.63 |
| 4 | 2 | 0.58 |
| 5 | 4 | 1.15 |

plat |>  
 mutate(percent = round((Count/347)\*100, digits = 2)) |>  
 gt()

| Platform | Count | percent |
| --- | --- | --- |
| Google Classroom | 307 | 88.47 |
| Zoom | 95 | 27.38 |
| Edmodo | 45 | 12.97 |
| Google Meet | 210 | 60.52 |
| Ms. Teams | 248 | 71.47 |
| Facebook | 202 | 58.21 |
| Messenger | 239 | 68.88 |

# Objective 3

est <- propla |>  
 select(S1:S15) |>  
 get\_summary\_stats(  
 show = c("mean", "sd")  
 ) |>  
 mutate\_if(is.numeric, round, 2) |>  
 mutate(QD = case\_when(  
 mean >= 4.21 & mean <= 5 ~ "Lubos na Sumasang-ayon",  
 mean >= 3.41 & mean <= 4.20 ~ "Sumasang-ayon",  
 mean >= 2.61 & mean <= 3.40 ~ "Bahagyang Sang-ayon",  
 mean >= 1.81 & mean <= 2.60 ~ "Hindi Sumasang-ayon",  
 mean >= 1 & mean <= 1.80 ~ "Lubos na Hindi Sumasang-ayon"  
 ))  
gt(est)

| variable | n | mean | sd | QD |
| --- | --- | --- | --- | --- |
| S1 | 347 | 4.06 | 0.98 | Sumasang-ayon |
| S2 | 345 | 3.98 | 0.84 | Sumasang-ayon |
| S3 | 347 | 4.14 | 0.88 | Sumasang-ayon |
| S4 | 347 | 4.58 | 0.67 | Lubos na Sumasang-ayon |
| S5 | 347 | 4.20 | 0.85 | Sumasang-ayon |
| S6 | 347 | 3.84 | 1.02 | Sumasang-ayon |
| S7 | 347 | 4.11 | 0.86 | Sumasang-ayon |
| S8 | 347 | 3.46 | 1.22 | Sumasang-ayon |
| S9 | 347 | 3.52 | 1.08 | Sumasang-ayon |
| S10 | 347 | 3.73 | 0.94 | Sumasang-ayon |
| S11 | 347 | 3.78 | 0.99 | Sumasang-ayon |
| S12 | 347 | 4.08 | 0.82 | Sumasang-ayon |
| S13 | 347 | 3.36 | 1.17 | Bahagyang Sang-ayon |
| S14 | 347 | 4.14 | 0.86 | Sumasang-ayon |
| S15 | 347 | 4.36 | 0.89 | Lubos na Sumasang-ayon |

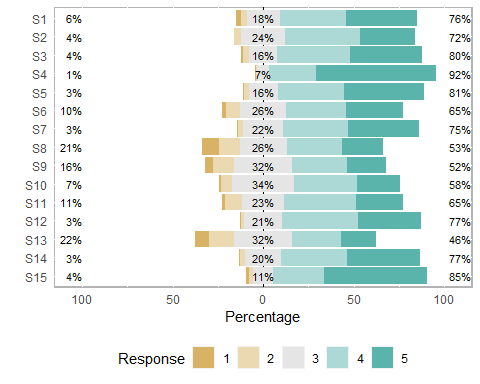
est |>  
 get\_summary\_stats(mean, show = c("mean")) |>  
 mutate(average\_est\_sd = sqrt(sum((est$sd)^2)/n)) |>  
 mutate\_if(is.numeric, round, 2) |>  
 mutate(QD = case\_when(  
 mean >= 4.21 & mean <= 5 ~ "Lubos na Sumasang-ayon",  
 mean >= 3.41 & mean <= 4.20 ~ "Sumasang-ayon",  
 mean >= 2.61 & mean <= 3.40 ~ "Bahagyang Sang-ayon",  
 mean >= 1.81 & mean <= 2.60 ~ "Hindi Sumasang-ayon",  
 mean >= 1 & mean <= 1.80 ~ "Lubos na Hindi Sumasang-ayon"  
 )) |>  
 gt()

| variable | n | mean | average\_est\_sd | QD |
| --- | --- | --- | --- | --- |
| mean | 15 | 3.96 | 0.95 | Sumasang-ayon |

propla |>  
 get\_summary\_stats(s\_mean,  
 show = c("mean", "sd", "min", "max"),  
 ) |>  
 mutate\_if(is.numeric, round, 2) |>  
 gt()

| variable | n | mean | sd | min | max |
| --- | --- | --- | --- | --- | --- |
| s\_mean | 347 | 3.96 | 0.52 | 2.47 | 5 |

est\_fact <- propla |>  
 select(S1:S15) |>  
 as.data.frame()  
  
est\_fact[1:15] = lapply(est\_fact[1:15], factor, levels = 1:5)  
  
est\_fact\_likert = likert(est\_fact[1:15])  
  
plot(est\_fact\_likert, ordered = FALSE, group.order = names(est\_fact[1:15]))



est\_fact\_likert$results |>  
 tibble() |>  
 mutate\_if(is.numeric, round, 2) |>  
 gt()

| Item | 1 | 2 | 3 | 4 | 5 |
| --- | --- | --- | --- | --- | --- |
| S1 | 3.17 | 2.88 | 18.16 | 36.89 | 38.90 |
| S2 | 0.00 | 4.06 | 24.35 | 41.45 | 30.14 |
| S3 | 1.15 | 3.17 | 15.56 | 40.35 | 39.77 |
| S4 | 0.29 | 0.58 | 6.92 | 25.65 | 66.57 |
| S5 | 0.86 | 2.31 | 16.14 | 36.89 | 43.80 |
| S6 | 2.02 | 7.78 | 25.65 | 32.85 | 31.70 |
| S7 | 0.29 | 2.59 | 22.19 | 36.02 | 38.90 |
| S8 | 9.51 | 11.24 | 25.94 | 30.84 | 22.48 |
| S9 | 4.32 | 11.82 | 32.28 | 30.26 | 21.33 |
| S10 | 1.44 | 6.05 | 34.29 | 34.58 | 23.63 |
| S11 | 1.73 | 9.51 | 23.34 | 39.48 | 25.94 |
| S12 | 0.58 | 2.02 | 20.75 | 42.07 | 34.58 |
| S13 | 7.78 | 14.12 | 31.99 | 26.80 | 19.31 |
| S14 | 0.58 | 2.59 | 19.88 | 36.60 | 40.35 |
| S15 | 1.73 | 2.31 | 10.66 | 28.53 | 56.77 |

propla |>  
 get\_summary\_stats(s\_mean,  
 show = c("mean", "sd", "min", "max"),  
 ) |>  
 mutate\_if(is.numeric, round, 2) |>  
 gt()

| variable | n | mean | sd | min | max |
| --- | --- | --- | --- | --- | --- |
| s\_mean | 347 | 3.96 | 0.52 | 2.47 | 5 |

# Objective 4

mod\_propla\_data <- propla |>  
 select(Kolehiyo, Kasarian, Edad, Type, BKP, Platform, s\_mean)  
  
model <- lm(s\_mean ~ ., data = mod\_propla\_data)  
anova\_propla <- aov(s\_mean ~ ., data = mod\_propla\_data)  
anova\_propla1 <- Anova(anova\_propla, type = "II")  
  
anova\_propla1 |>  
 tidy() |>  
 mutate\_if(is.numeric, round, 2) |>  
 gt()

| term | sumsq | df | statistic | p.value |
| --- | --- | --- | --- | --- |
| Kolehiyo | 3.17 | 7 | 1.75 | 0.10 |
| Kasarian | 1.20 | 1 | 4.62 | 0.03 |
| Edad | 0.72 | 2 | 1.39 | 0.25 |
| Type | 0.01 | 1 | 0.03 | 0.86 |
| BKP | 0.96 | 3 | 1.23 | 0.30 |
| Platform | 0.88 | 4 | 0.85 | 0.49 |
| Residuals | 84.80 | 328 | NA | NA |

summary(anova\_propla)

Df Sum Sq Mean Sq F value Pr(>F)   
Kolehiyo 7 3.32 0.4743 1.834 0.0800 .  
Kasarian 1 1.08 1.0802 4.178 0.0418 \*  
Edad 2 0.96 0.4797 1.855 0.1580   
Type 1 0.00 0.0001 0.000 0.9848   
BKP 3 1.03 0.3437 1.329 0.2647   
Platform 4 0.88 0.2209 0.854 0.4916   
Residuals 328 84.80 0.2586   
---  
Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

group\_by(propla, Kasarian) %>%  
 summarise(  
 count = n(),  
 mean = mean(s\_mean, na.rm = TRUE),  
 sd = sd(s\_mean, na.rm = TRUE)  
 ) |>  
 gt()

| Kasarian | count | mean | sd |
| --- | --- | --- | --- |
| F | 151 | 4.019048 | 0.5192319 |
| M | 196 | 3.906803 | 0.5092189 |

tukey\_hsd(propla, s\_mean ~ Kasarian)

# A tibble: 1 × 9  
 term group1 group2 null.value estimate conf.low conf.high p.adj p.adj.signif  
\* <chr> <chr> <chr> <dbl> <dbl> <dbl> <dbl> <dbl> <chr>   
1 Kasa… F M 0 -0.112 -0.222 -0.00286 0.0443 \*

leveneTest(s\_mean ~ Kasarian, data = propla)

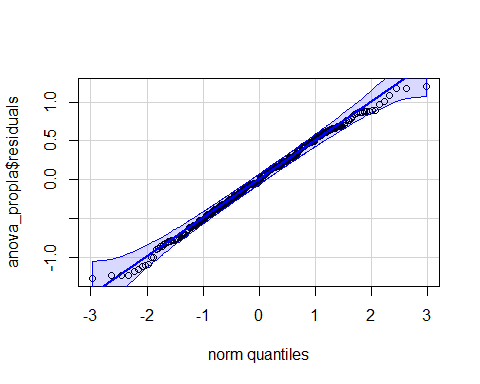
Warning in leveneTest.default(y = y, group = group, ...): group coerced to  
factor.

Levene's Test for Homogeneity of Variance (center = median)  
 Df F value Pr(>F)  
group 1 0.5316 0.4664  
 345

summary(model)

Call:  
lm(formula = s\_mean ~ ., data = mod\_propla\_data)  
  
Residuals:  
 Min 1Q Median 3Q Max   
-1.26634 -0.32782 -0.01612 0.34177 1.20044   
  
Coefficients:  
 Estimate Std. Error t value Pr(>|t|)   
(Intercept) 3.92365 0.14231 27.571 < 2e-16 \*\*\*  
KolehiyoCAS 0.15768 0.11113 1.419 0.15688   
KolehiyoCBE 0.22867 0.13752 1.663 0.09729 .   
KolehiyoCFERM 0.30622 0.12586 2.433 0.01551 \*   
KolehiyoCHE 0.21588 0.13142 1.643 0.10142   
KolehiyoCOE 0.36550 0.12111 3.018 0.00275 \*\*   
KolehiyoCTE 0.28325 0.11996 2.361 0.01880 \*   
KolehiyoCVM 0.15756 0.16174 0.974 0.33068   
KasarianM -0.12917 0.06007 -2.150 0.03226 \*   
EdadY -0.12145 0.07361 -1.650 0.09992 .   
EdadZ -0.06243 0.08753 -0.713 0.47621   
TypeXYZ -0.01368 0.07624 -0.179 0.85767   
BKP2 0.12651 0.06621 1.911 0.05691 .   
BKP3 0.04632 0.08287 0.559 0.57658   
BKP4 0.07973 0.12809 0.622 0.53405   
Platform2 -0.10616 0.09371 -1.133 0.25809   
Platform3 -0.16031 0.09651 -1.661 0.09766 .   
Platform4 -0.38553 0.37262 -1.035 0.30160   
Platform5 -0.07011 0.26937 -0.260 0.79481   
---  
Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
  
Residual standard error: 0.5085 on 328 degrees of freedom  
Multiple R-squared: 0.079, Adjusted R-squared: 0.02846   
F-statistic: 1.563 on 18 and 328 DF, p-value: 0.06767

qqPlot(anova\_propla$residuals,  
 id = FALSE # id = FALSE to remove point identification  
)



shapiro.test(anova\_propla$residuals)

Shapiro-Wilk normality test  
  
data: anova\_propla$residuals  
W = 0.99436, p-value = 0.2292