PROJECT.R

saisr

2024-01-16

```
# changing variables
library(readxl)
```

```
## Warning: package 'readxl' was built under R version 4.3.2
```

```
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 4.3.2
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
# Read the Excel file
excel_file_path <- "C:\\Users\\saisr\\OneDrive\\Desktop\\Influence of Digital platform usage among stud
rdd <- read_excel(excel_file_path)

# Display the original column names
print(names(rdd))
```

```
##  [1] "Timestamp"
##  [2] "Email address"
##  [3] "1. Age"
##  [4] "2. I am currently studying"
##  [5] "3. Gender"
##  [6] "4. Do you have a part-time job or internship in addition to your studies?"
##  [7] "5. Do you live in an urban or rural area?"
##  [8] "Answer the below questions [I regularly use digital platforms for academic purposes]"
##  [9] "Answer the below questions [I am concerned about the reliability of information found on digit
## [10] "Answer the below questions [I believe digital platforms have improved my digital literacy skil
## [11] "Answer the below questions [I gained skills through these digital platforms that will benefit
## [12] "Answer the below questions [I find the quality of content on digital platforms better compared
## [13] "Answer the below questions [My interaction with classmates or instructors has changed with dig
## [14] "Answer the below questions [I feel that digital platforms offer a more personalized learning e
## [15] "Answer the below questions [My academic performance (percentage) has improved after using digi
## [16] "Answer the below questions [Have digital platforms improved your learning experience compared
## [17] "Answer the below questions [I have participated in online discussions or forums related to my
## [18] "Answer the below questions [I can manage my time using digital platforms for academic and leis
## [19] "Answer the below questions [I have experienced distractions while using digital platforms for
```

```
## [20] "Answer the below questions [I find using digital platforms for collaborative projects has impro
## [21] "Answer the below questions [I use digital tools or apps to help manage my study schedule and as
## [22] "Answer the below questions [I have used digital platforms to collaborate with classmates on gro
```

```r
# Change the variable name
# Display the original column names
print(names(rdd))
```

```
##  [1] "Timestamp"
##  [2] "Email address"
##  [3] "1. Age"
##  [4] "2. I am currently studying"
##  [5] "3. Gender"
##  [6] "4. Do you have a part-time job or internship in addition to your studies?"
##  [7] "5. Do you live in an urban or rural area?"
##  [8] "Answer the below questions [I regularly use digital platforms for academic purposes]"
##  [9] "Answer the below questions [I am concerned about the reliability of information found on digita
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## [11] "Answer the below questions [I gained skills through these digital platforms that will benefit m
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## [17] "Answer the below questions [I have participated in online discussions or forums related to my a
## [18] "Answer the below questions [I can manage my time using digital platforms for academic and leisu
## [19] "Answer the below questions [I have experienced distractions while using digital platforms for s
## [20] "Answer the below questions [I find using digital platforms for collaborative projects has impro
## [21] "Answer the below questions [I use digital tools or apps to help manage my study schedule and as
## [22] "Answer the below questions [I have used digital platforms to collaborate with classmates on gro
```

```r
# Rename columns
names(rdd) <- c("Timestamp", "Email_address", "Age", "Studying", "Gender","Internship", "Rural_or_Urban"
                "Digital_literacy", "Gained_skills", "Quality_content", "Interaction_with_classmates",
                "Personalised_learning_experience", "Academic_percentage_increase", "Learning_experience
                "Online_discussion_participation", "Time_management", "Distractions", "Productivity",
                "Usage_for_study_schedule", "Collaboration_with_classmates")


#install.packages("dplyr")
library(dplyr)

# Define the mapping
response_mapping <- c("Strongly Disagree" = 1, "Disagree" = 2, "Neutral" = 3, "Agree" = 4, "Strongly Agr

# Specify the columns you want to convert
columns_to_convert <- c("Regularity", "Reliability",
                        "Digital_literacy", "Gained_skills", "Quality_content", "Interaction_with_classm
                        "Personalised_learning_experience", "Academic_percentage_increase", "Learning_ex
                        "Online_discussion_participation", "Time_management", "Distractions", "Productiv
                        "Usage_for_study_schedule", "Collaboration_with_classmates")

# Apply the mapping to the specified columns using mutate_all
rdd <- rdd %>%
  mutate(across(all_of(columns_to_convert), ~response_mapping[.]))
```

```r
# Summative score calculation
numeric_columns <- c("Regularity", "Reliability",
                     "Digital_literacy", "Gained_skills", "Quality_content", "Interaction_with_classmate
                     "Personalised_learning_experience", "Academic_percentage_increase", "Learning_exper
                     "Online_discussion_participation", "Time_management", "Distractions", "Productivity
                     "Usage_for_study_schedule", "Collaboration_with_classmates")

# Create a new column 'SummativeScore' with the sum of the numeric values for each row
rdd$SummativeScore <- rowSums(rdd[, numeric_columns], na.rm = TRUE)

# Print the dataframe and its structure
rdd
```

```
## # A tibble: 205 x 23
##    Timestamp           Email_address            Age   Studying Gender Internship
##    <dttm>              <chr>                    <chr> <chr>    <chr>  <chr>
##  1 2023-11-12 17:52:09 krkhushi019@gmail.com    19-22 Undergr~ Female Yes
##  2 2023-11-12 17:54:06 vaibhavindian2407@gmail~ 19-22 Undergr~ Female No
##  3 2023-11-12 17:54:42 mvineela66@gmail.com     19-22 Postgra~ Female Yes
##  4 2023-11-12 17:55:08 likhithreddy38@gmail.com 19-22 Undergr~ Male   No
##  5 2023-11-12 17:56:57 surabatthinimounika9999~ 19-22 Postgra~ Female No
##  6 2023-11-12 17:57:22 sarveshk7499@gmail.com   19-22 Undergr~ Male   No
##  7 2023-11-12 18:11:12 dharanichigulla8465@gma~ 19-22 Undergr~ Female No
##  8 2023-11-12 18:16:08 akshayahosmaneakshaya@g~ 19-22 Undergr~ Female Yes
##  9 2023-11-12 18:17:08 ecjaya1982@gmail.com     16-18 Interme~ Female No
## 10 2023-11-12 18:19:42 ecikshita@gmail.com      16-18 Interme~ Female No
## # i 195 more rows
## # i 17 more variables: Rural_or_Urban <chr>, Regularity <dbl>,
## #   Reliability <dbl>, Digital_literacy <dbl>, Gained_skills <dbl>,
## #   Quality_content <dbl>, Interaction_with_classmates <dbl>,
## #   Personalised_learning_experience <dbl>, Academic_percentage_increase <dbl>,
## #   Learning_experience <dbl>, Online_discussion_participation <dbl>,
## #   Time_management <dbl>, Distractions <dbl>, Productivity <dbl>, ...
```

```r
str(rdd)
```

```
## tibble [205 x 23] (S3: tbl_df/tbl/data.frame)
##  $ Timestamp                      : POSIXct[1:205], format: "2023-11-12 17:52:09" "2023-11-12 17:54
##  $ Email_address                  : chr [1:205] "krkhushi019@gmail.com" "vaibhavindian2407@gmail.com
##  $ Age                            : chr [1:205] "19-22" "19-22" "19-22" "19-22" ...
##  $ Studying                       : chr [1:205] "Undergraduate" "Undergraduate" "Postgraduate" "Unde
##  $ Gender                         : chr [1:205] "Female" "Female" "Female" "Male" ...
##  $ Internship                     : chr [1:205] "Yes" "No" "Yes" "No" ...
##  $ Rural_or_Urban                 : chr [1:205] "Urban" "Urban" "Urban" "Urban" ...
##  $ Regularity                     : Named num [1:205] 5 5 5 5 5 5 5 3 3 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Strongly Agree" "Strongly Agree" "Strongly Agre
##  $ Reliability                    : Named num [1:205] 5 4 5 5 5 2 5 4 3 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
##  $ Digital_literacy               : Named num [1:205] 5 4 5 5 5 5 5 4 3 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
##  $ Gained_skills                  : Named num [1:205] 5 4 5 5 5 5 5 4 3 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
##  $ Quality_content                : Named num [1:205] 5 4 5 5 5 5 5 4 2 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
```

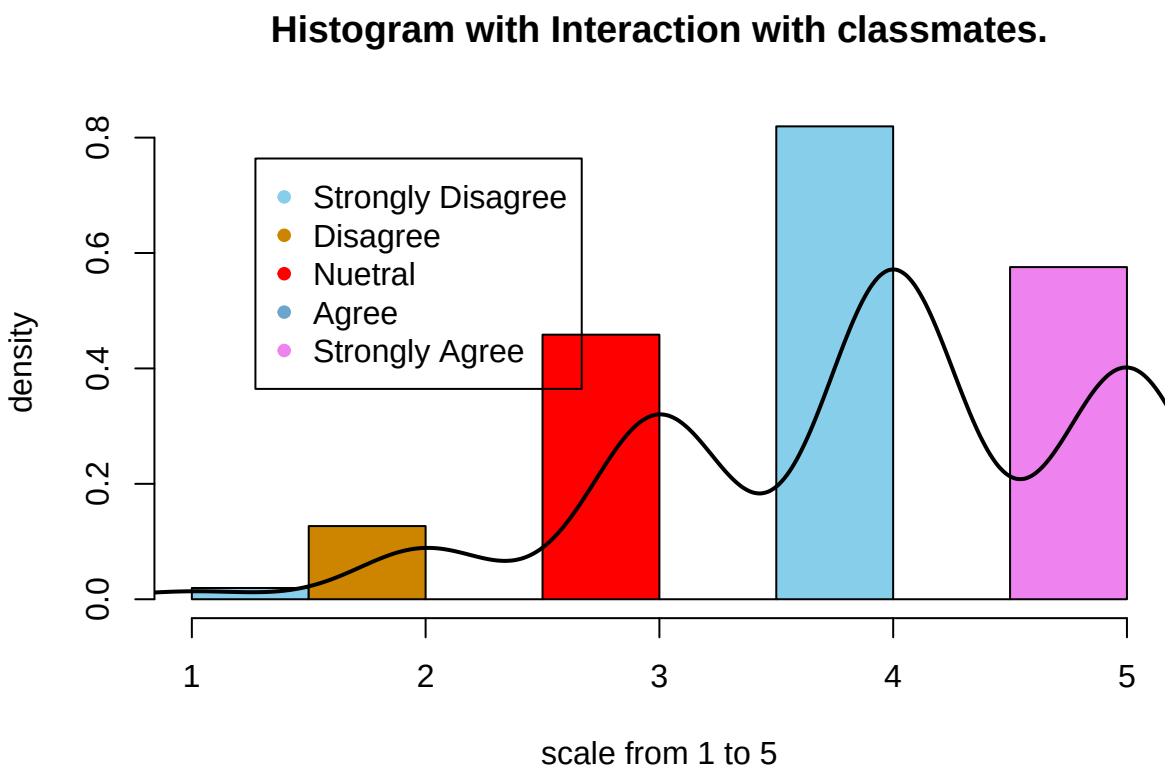
```
##  $ Interaction_with_classmates     : Named num [1:205] 5 4 5 4 5 4 5 4 4 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Agree" ...
##  $ Personalised_learning_experience: Named num [1:205] 5 4 5 5 5 4 5 4 3 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
##  $ Academic_percentage_increase    : Named num [1:205] 5 4 5 5 5 4 5 4 3 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
##  $ Learning_experience             : Named num [1:205] 5 4 5 5 5 4 5 4 2 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
##  $ Online_discussion_participation : Named num [1:205] 5 4 5 5 5 4 5 4 3 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
##  $ Time_management                 : Named num [1:205] 5 4 5 5 5 4 5 4 3 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
##  $ Distractions                    : Named num [1:205] 5 4 5 5 5 4 5 4 4 4 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
##  $ Productivity                    : Named num [1:205] 5 4 5 5 5 3 5 4 3 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
##  $ Usage_for_study_schedule        : Named num [1:205] 5 4 5 5 5 3 5 4 3 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
##  $ Collaboration_with_classmates   : Named num [1:205] 5 4 5 5 5 5 5 4 3 3 ...
##   ..- attr(*, "names")= chr [1:205] "Strongly Agree" "Agree" "Strongly Agree" "Strongly Agree" ...
##  $ SummativeScore                  : num [1:205] 75 61 75 74 75 61 75 59 45 46 ...
```

```
summary(rdd)
```

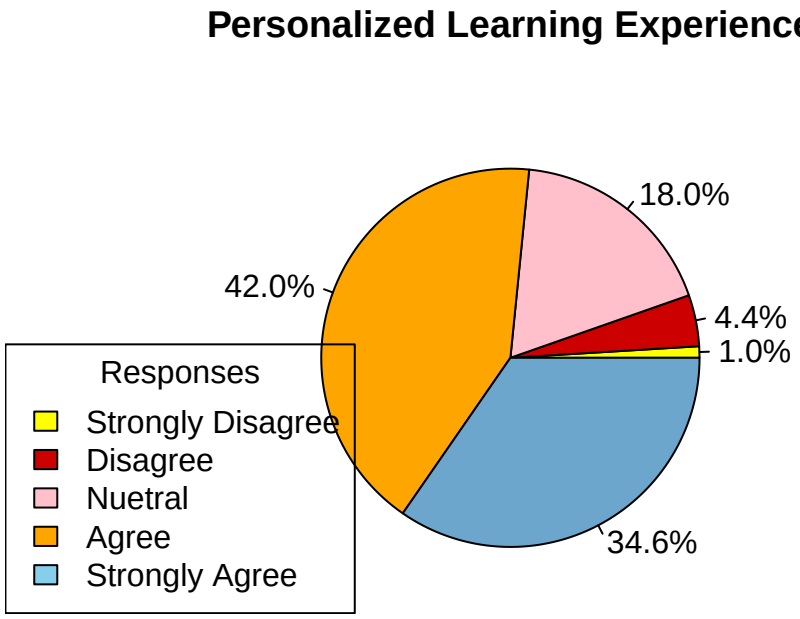
```
##    Timestamp                      Email_address          Age
##  Min.   :2023-11-12 17:52:09.66   Length:205         Length:205
##  1st Qu.:2023-11-12 20:11:11.65   Class :character   Class :character
##  Median :2023-11-12 21:11:18.18   Mode  :character   Mode  :character
##  Mean   :2023-11-13 07:38:22.19
##  3rd Qu.:2023-11-13 00:13:53.18
##  Max.   :2023-11-19 16:01:52.05
##    Studying            Gender           Internship        Rural_or_Urban
##  Length:205         Length:205         Length:205         Length:205
##  Class :character   Class :character   Class :character   Class :character
##  Mode  :character   Mode  :character   Mode  :character   Mode  :character
##
##
##
##    Regularity     Reliability    Digital_literacy Gained_skills
##  Min.   :1.000   Min.   :1.000   Min.   :1.000    Min.   :1.000
##  1st Qu.:4.000   1st Qu.:4.000   1st Qu.:4.000    1st Qu.:4.000
##  Median :4.000   Median :4.000   Median :4.000    Median :4.000
##  Mean   :4.224   Mean   :4.005   Mean   :4.215    Mean   :4.195
##  3rd Qu.:5.000   3rd Qu.:5.000   3rd Qu.:5.000    3rd Qu.:5.000
##  Max.   :5.000   Max.   :5.000   Max.   :5.000    Max.   :5.000
##  Quality_content Interaction_with_classmates Personalised_learning_experience
##  Min.   :1.000   Min.   :1.000               Min.   :1.000
##  1st Qu.:3.000   1st Qu.:3.000               1st Qu.:4.000
##  Median :4.000   Median :4.000               Median :4.000
##  Mean   :3.966   Mean   :3.902               Mean   :4.049
##  3rd Qu.:5.000   3rd Qu.:5.000               3rd Qu.:5.000
##  Max.   :5.000   Max.   :5.000               Max.   :5.000
##  Academic_percentage_increase Learning_experience
##  Min.   :1.000                Min.   :1.000
##  1st Qu.:3.000                1st Qu.:4.000
```

```
##  Median :4.000                Median :4.000
##  Mean   :3.971                Mean   :3.956
##  3rd Qu.:5.000                3rd Qu.:5.000
##  Max.   :5.000                Max.   :5.000
##  Online_discussion_participation Time_management  Distractions
##  Min.   :1.00                    Min.   :1.000   Min.   :1.000
##  1st Qu.:3.00                    1st Qu.:3.000   1st Qu.:4.000
##  Median :4.00                    Median :4.000   Median :4.000
##  Mean   :3.81                    Mean   :3.863   Mean   :4.132
##  3rd Qu.:5.00                    3rd Qu.:4.000   3rd Qu.:5.000
##  Max.   :5.00                    Max.   :5.000   Max.   :5.000
##   Productivity   Usage_for_study_schedule Collaboration_with_classmates
##  Min.   :1.000   Min.   :1.000            Min.   :1.000
##  1st Qu.:4.000   1st Qu.:4.000            1st Qu.:4.000
##  Median :4.000   Median :4.000            Median :4.000
##  Mean   :4.068   Mean   :3.971            Mean   :4.059
##  3rd Qu.:5.000   3rd Qu.:5.000            3rd Qu.:5.000
##  Max.   :5.000   Max.   :5.000            Max.   :5.000
##  SummativeScore
##  Min.   :15.00
##  1st Qu.:56.00
##  Median :60.00
##  Mean   :60.39
##  3rd Qu.:67.00
##  Max.   :75.00
```

```r
hist(rdd$Interaction_with_classmates,xlab= "scale from 1 to 5", ylab= "density",
     main = "Histogram with Interaction with classmates."
     , prob=T, col = c("skyblue","orange3","violet","red","purple"))
lines(density(rdd$Interaction_with_classmates),col = "black",lwd = 2)
legend("topleft",
       legend = c("Strongly Disagree","Disagree","Nuetral","Agree","Strongly Agree"),
       col = c("skyblue","orange3","red","skyblue3","violet"),
       pch = c(19,19),
       bty = 0,
       pt.cex = 0.8,
       text.col = "black",
       horiz = F,
       inset = c(0.1,0.1))
```



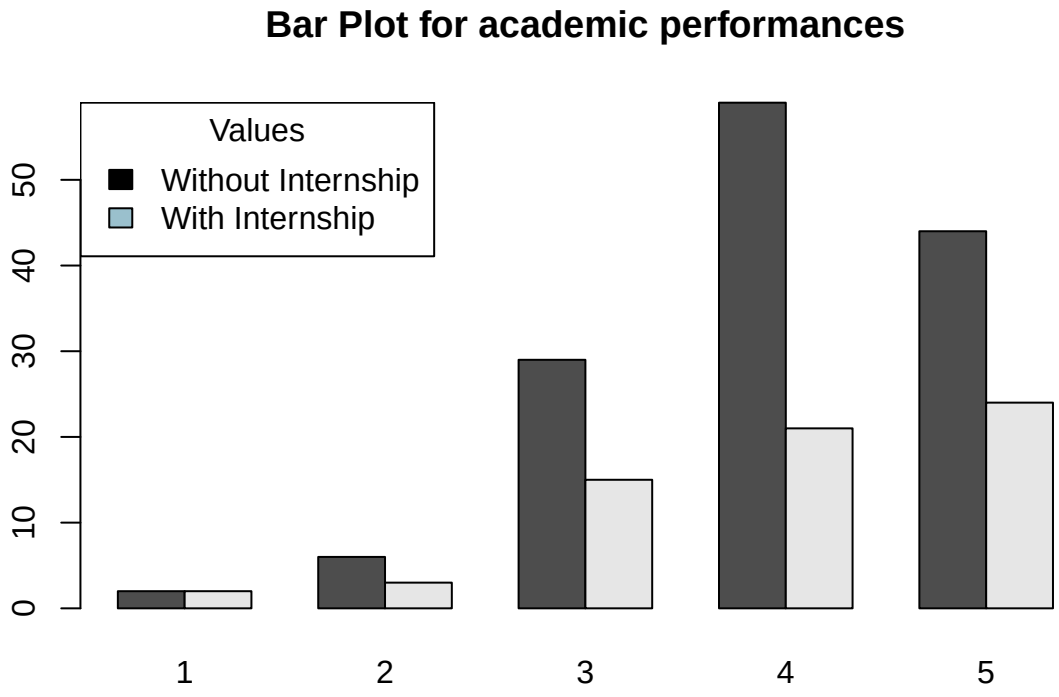

```
#  Interpretation

#  Students acknowledge an improvement in their interactions with classmates due
#  to learning from digital platforms. This indicates that engaging with digital
#  learning has not only boosted their confidence levels but has also positively
#  influenced the overall quality of their interactions with fellow students.


#2. Personalized learning experience.

p=rdd$Personalised_learning_experience
p.counts=table(p)
p.percentages <- (p.counts / sum(p.counts)) * 100
names(p.counts)= c("Strongly Disagree","Disagree","Nuetral","Agree","Strongly Agree")
pie(p.counts,labels =  sprintf("%.1f%%", p.percentages),col=c("yellow","red3","pink","orange","skyblue3
colors = c("yellow", "red3", "pink", "orange", "skyblue")
legend("bottomleft", legend = names(p.counts), fill = colors, title = "Responses")
```



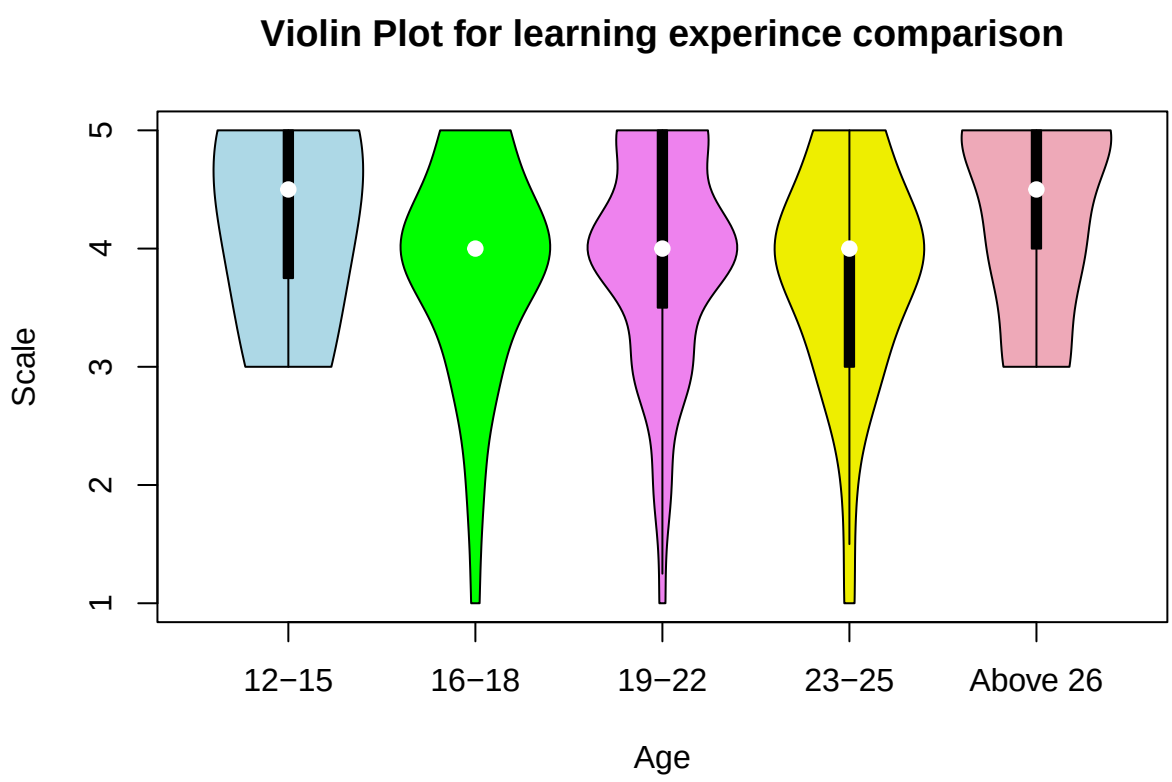

```
#   Interpretation

#  Students agreeing that digital platforms offer a personalized learning
#  experience indicates their active engagement in digital learning. This
#  involvement is seen as beneficial for improving their performance, as
#  personalized learning caters to their individual needs and preferences.
#  In essence, the students find value in the personalized approach provided
#  by digital platforms, leading to enhanced learning outcomes.



#3. Academic performance
color = c("black","lightblue3")
a= table(rdd$Internship,rdd$Academic_percentage_increase)
barplot(a,beside = T, main ="Bar Plot for academic performances")
legend("topleft", legend = c("Without Internship","With Internship"), fill = color, title = "Values")


#   Interpretation
#    Students who work part-time jobs or internships say that using digital tools
#    and websites has helped them do better in academic performances. These
#    digital platforms resources make it easier for them to understand their
#    subjects, stay organized, and get extra learning materials. So, even
#    though they're working, these digital tools help them manage everything
#   and improve their grades in school.
```

```r
#4. Learning experience comparison with Traditional methods

library(vioplot)
```

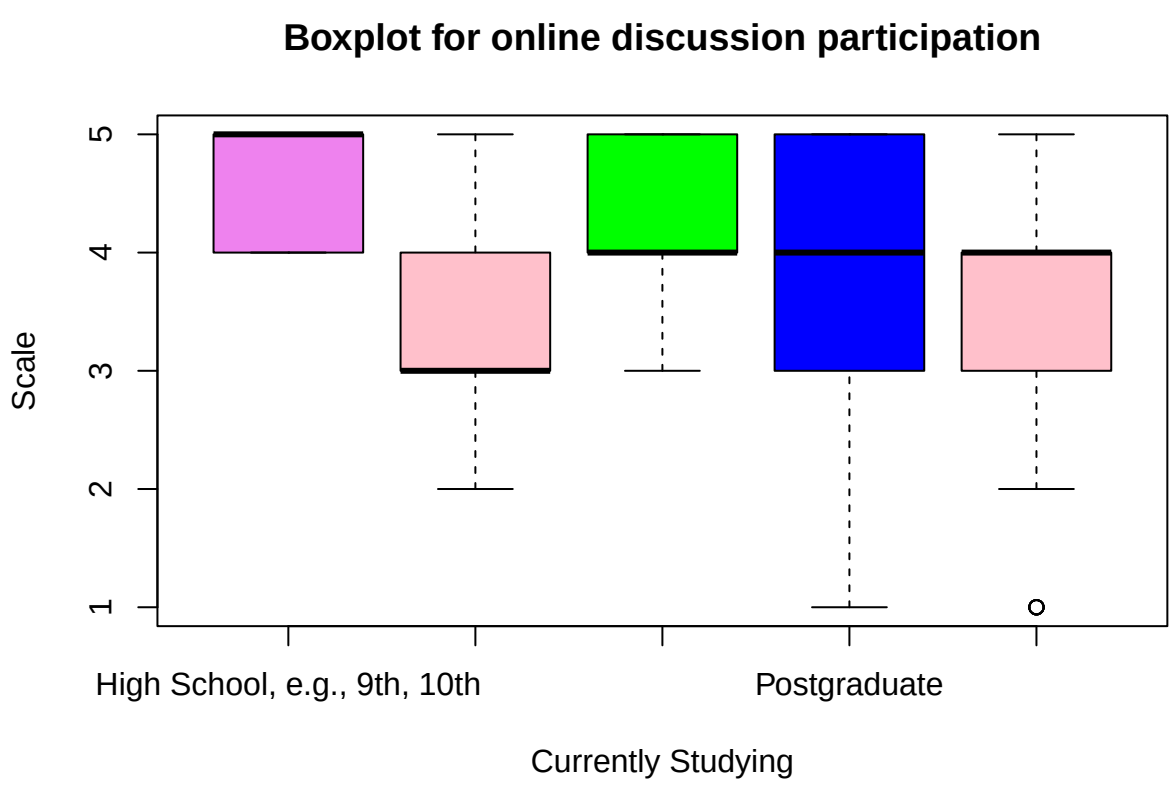
```
## Warning: package 'vioplot' was built under R version 4.3.2
## Loading required package: sm
## Warning: package 'sm' was built under R version 4.3.2
## Package 'sm', version 2.2-5.7: type help(sm) for summary information
## Loading required package: zoo
## Warning: package 'zoo' was built under R version 4.3.2
##
## Attaching package: 'zoo'
## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric
```




```r
vioplot(rdd$Learning_experience ~ rdd$Age, col = c("lightblue","green","violet","yellow2","pink2"),main=
```




```r
# Interpretation.

#   Majority of students, from various age groups, have found the learning
#   experience from digital platforms beneficial, mainly because it provides a
#   personalized learning experience tailored to individual needs. However, it's
#   interesting to note that students aged 16 to 25 still express a preference
#   for traditional methods of learning. This could imply that while digital
#   platforms offer advantages, some students within this age range believe
#   that the more conventional ways of learning, such as in-person classes or
#   traditional textbooks, are superior.


#5.   Online Discussion Participation.

boxplot(rdd$Online_discussion_participation ~ rdd$Studying, data = rdd,
        main = "Boxplot for online discussion participation",
        ylab = "Scale",
        xlab = "Currently Studying",
        col= c("violet","pink","green","blue","pink"), horizontal = FALSE)
```




```
#   Interpretation
#   Many students from various grades and groups actively participate in online
#   discussions or forums on digital platforms for academic purposes. This
#   involvement is proving to be beneficial, contributing to improved learning
#   and better academic performance. Essentially, students find that engaging
#   in these online discussions on educational platforms helps them understand
#   their studies better and boosts their grades.




#           OVERALL INTERPRETATION


#  Students say that using digital platforms for learning helps them talk
#  with classmates better. This makes them feel more sure of themselves and
#  improves how well they get along with others. When students agree that
#  learning online is personal, it means they are involved in it. This is good
#  for doing better in academic performances because personal learning is about
#  what each student likes and needs. Students who work part-time jobs
#  or internships find that using digital platforms tools makes their learning
#  easier. Most students of different ages think learning from these platforms
#  is good. However, some students aged between 16 to 25 still prefer the
#  traditional methods of learning, like in-person classes or regular books.
```

```r
#  Many students from different grades and groups take part in online
#  discussions or forums on these platforms for academic purposes. This helps
#  them to understand their studies better and get better grades.
#  In general, students believe that using digital platforms helps them do
#  better in their performances.




table(rdd$Age, rdd$Academic_percentage_increase)
```

```
##
##             1  2  3  4  5
##   12-15     0  1  0  1  2
##   16-18     0  1  8 23  5
##   19-22     2  5 25 37 42
##   23-25     1  0  6 14  8
##   Above 26  1  2  5  5 11
```

```r
two = aov(SummativeScore ~ Academic_percentage_increase * Age,
          data = rdd
)
two
```

```
## Call:
##    aov(formula = SummativeScore ~ Academic_percentage_increase *
##     Age, data = rdd)
##
## Terms:
##                 Academic_percentage_increase      Age
## Sum of Squares                      9440.050  541.955
## Deg. of Freedom                            1        4
##                 Academic_percentage_increase:Age Residuals
## Sum of Squares                           15.992  8072.560
## Deg. of Freedom                                4       195
##
## Residual standard error: 6.434108
## Estimated effects may be unbalanced
```

```r
summary(two)
```

```
##                                Df Sum Sq Mean Sq F value Pr(>F)
## Academic_percentage_increase    1   9440    9440 228.033 <2e-16 ***
## Age                             4    542     135   3.273 0.0126 *
## Academic_percentage_increase:Age   4     16       4   0.097 0.9835
## Residuals                     195   8073      41
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
# interpretation


#Two-Way ANOVA

#HO1:  There is no significant difference in the academic performance
#based on summative scores
```

```r
#H11: There is a significant difference in the academic performance
# based on summative scores

#H02:  There is no significant difference in the academic performance between
#different age groups based on summative scores


#H12:  There is a significant difference in the academic performance between
#different age groups based on summative scores

#Score (p value)
#Academic percentage = 0.0000000000000002
#Age = 0.0126
#Age and Academic Performance = 0.9835

#In the two-way ANOVA model context, a notable impact is observed on academic
#percentage. Nevertheless, the factors "Age" and the interaction between "Age"
#and "academic percentage increase" do not exhibit a statistically significant
#influence in this analysis based on the Summative Score. That there is means
#no relationship that is specific to age that influence in increased academic
#performance. All age groups showed a significant increase in academic performance.


one= aov(SummativeScore ~ Learning_experience,
         data = rdd )
one
```

```
## Call:
##    aov(formula = SummativeScore ~ Learning_experience, data = rdd)
##
## Terms:
##                 Learning_experience Residuals
## Sum of Squares             12581.49   5489.07
## Deg. of Freedom                   1       203
##
## Residual standard error: 5.199976
## Estimated effects may be unbalanced
```

```r
summary(one)
```

```
##                      Df Sum Sq Mean Sq F value Pr(>F)
## Learning_experience   1  12581   12581   465.3 <2e-16 ***
## Residuals           203   5489      27
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
# Interpretation
#ONE WAY ANOVA
#H0: Overall there is no significant difference in the academic performance
#among students based on summative score.

#H1: Overall there is a significant difference in the academic performance
#among students based on summative score.

#Score (P value)
```

```
#Learning experience = 0.0000000000000002
#Analysis
#The one-way ANOVA reveals a clear difference in learning outcomes between
#traditional and modern methods. The results strongly imply that digital
#platforms play a more significant role in influencing these outcomes than
#traditional methods based on summative score. In conclusion, students who learn
#using digital platforms appears to have a more noticeable effect on the results
#compared to learning through traditional means.




# CONCLUSION

#The findings suggest that students perceive digital platforms as valuable
#tools for enhancing their learning experiences and academic performances.
#Improved communication with classmates and increased self-assurance contribute
#to a positive learning environment. The recognition of online learning as a
#personalized and engaging experience aligns with improved academic outcomes.
#Notably, students juggling part-time jobs or internships find digital platforms
#beneficial in managing their studies. While a majority of students, spanning
#different age groups, embrace digital learning, a subset of individuals aged
#16 to 25 still prefers traditional methods. Active participation in online
#discussions emerges as a common practice, leading to better understanding
#and higher grades. Statistical analyses, including two-way ANOVA and one-way
#ANOVA, support the notion that digital platforms have a more substantial
#impact on academic performance than traditional methods. Overall, the study
#underscores the widespread positive perception of digital platforms and their
#pivotal role in shaping contemporary learning outcomes.
```