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---  
title: "LA and feedback"  
author: "Cha Reyes"  
date: '2023-02-07'  
output:  
pdf_document: default  
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This is the RMarkdown file for the project entitled "Enhancing  
academic performance and student success through learning analytics  
based personalised feedback emails in first-year chemistry" (2023;  
SH Kyne, MMH Lee, CT Reyes)  
  
```${r Loading packages}  
library(tidyverse)
library(dplyr)
library(readr
library(readxl)
library(ggplot2)
install.packages(gplots)
library(gplots)
library(networkD3)
````  
  
```${r Confidence interval at 95% confidence level}  
#Figure 3.
FeedbackGrades <- read_excel("File path")
plotmeans(`Final mark` ~ `Received feedback`, data = FeedbackGrades,
frame = FALSE, mean.labels = FALSE, connect = FALSE, xlab = "Groups
who received/did not receive feedback", ylab = "Mean final course
grade")

````  
  
```${r Plotting Sankey network diagrams}  

#Figure 4.
#Semester 1 2019
S2019S1 <- read_excel("File path")
nodes2019S1 <- data.frame(
 name=c(as.characterS2019S1$source),
 as.character(S2019S1$target)) %>% unique()

S2019S1$IDsource <- matchS2019S1$source, nodes2019S1$name)-1
S2019S1$IDtarget <- matchS2019S1$target, nodes2019S1$name)-1

p2019S1 <- sankeyNetwork(Links = S2019S1, Nodes = nodes2019S1,
 Source = "IDsource", Target = "IDtarget",
 Value = "value", NodeID = "name", colourScale=my_color)
p2019S1

S2019S1 <- read_excel("File path")
nodes2019S1 <- data.frame(
 name=c(as.characterS2019S1$source),
 as.character(S2019S1$target)) %>% unique()

S2019S1$IDsource <- matchS2019S1$source, nodes2019S1$name)-1
S2019S1$IDtarget <- matchS2019S1$target, nodes2019S1$name)-1

p2019S1 <- sankeyNetwork(Links = S2019S1, Nodes = nodes2019S1,
 Source = "IDsource", Target = "IDtarget",
```

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 Value = "value", NodeID = "name", colourScale=my_color)
p2019S1

#Semester 2 2019
S2019S2 <- read_excel("File path")
nodes2019S1 <- data.frame(
 name=c(as.character(S2019S2$source),
 as.character(S2019S2$target)) %>% unique())

S2019S2$IDsource <- match(S2019S2$source, nodes2019S2$name)-1
S2019S2$IDtarget <- match(S2019S2$target, nodes2019S2$name)-1

p2019S2 <- sankeyNetwork(Links = S2019S2, Nodes = nodes2019S2,
 Source = "IDsource", Target = "IDtarget",
 Value = "value", NodeID = "name", colourScale=my_color)
p2019S2

#Semester 1 2020
S2020S1 <- read_excel("File path")
nodes2020S1 <- data.frame(
 name=c(as.character(S2020S1$source),
 as.character(S2020S1$target)) %>% unique())

S2020S1$IDsource <- match(S2020S1$source, nodes2020S1$name)-1
S2020S1$IDtarget <- match(S2020S1$target, nodes2020S1$name)-1

p2020S1 <- sankeyNetwork(Links = S2020S1, Nodes = nodes2020S1,
 Source = "IDsource", Target = "IDtarget",
 Value = "value", NodeID = "name", colourScale=my_color)
p2020S1

S2020S1 <- read_excel("File path")
nodes2020S1 <- data.frame(
 name=c(as.character(S2020S1$source),
 as.character(S2020S1$target)) %>% unique())

S2020S1$IDsource <- match(S2020S1$source, nodes2020S1$name)-1
S2020S1$IDtarget <- match(S2020S1$target, nodes2020S1$name)-1

p2020S1 <- sankeyNetwork(Links = S2020S1, Nodes = nodes2020S1,
 Source = "IDsource", Target = "IDtarget",
 Value = "value", NodeID = "name", colourScale=my_color)
p2020S1

#Semester 2 2020
S2020S2 <- read_excel("File path")
nodes2020S1 <- data.frame(
 name=c(as.character(S2020S2$source),
 as.character(S2020S2$target)) %>% unique())

S2020S2$IDsource <- match(S2020S2$source, nodes2020S2$name)-1
S2020S2$IDtarget <- match(S2020S2$target, nodes2020S2$name)-1

p2020S2 <- sankeyNetwork(Links = S2020S2, Nodes = nodes2020S2,
 Source = "IDsource", Target = "IDtarget",
 Value = "value", NodeID = "name", colourScale=my_color)
p2020S2

#Semester 1 2021
S2021S1 <- read_excel("File path ")

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nodes2021S1 <- data.frame(
 name=c(as.character(S2021S1$source),
 as.character(S2021S1$target)) %>% unique())

S2021S1$IDsource <- match(S2021S1$source, nodes2021S1$name)-1
S2021S1$IDtarget <- match(S2021S1$target, nodes2021S1$name)-1

p2021S1 <- sankeyNetwork(Links = S2021S1, Nodes = nodes2021S1,
 Source = "IDsource", Target = "IDtarget",
 Value = "value", NodeID = "name", colourScale=my_color)
p2021S1

S2021S1 <- read_excel("File path")
nodes2021S1 <- data.frame(
 name=c(as.character(S2021S1$source),
 as.character(S2021S1$target)) %>% unique())

S2021S1$IDsource <- match(S2021S1$source, nodes2021S1$name)-1
S2021S1$IDtarget <- match(S2021S1$target, nodes2021S1$name)-1

p2021S1 <- sankeyNetwork(Links = S2021S1, Nodes = nodes2021S1,
 Source = "IDsource", Target = "IDtarget",
 Value = "value", NodeID = "name", colourScale=my_color)
p2021S1

#Semester 2 2021
S2021S2 <- read_excel("File path")
nodes2021S2 <- data.frame(
 name=c(as.character(S2021S2$source),
 as.character(S2021S2$target)) %>% unique())

S2021S2$IDsource <- match(S2021S2$source, nodes2021S2$name)-1
S2021S2$IDtarget <- match(S2021S2$target, nodes2021S2$name)-1

p2021S2 <- sankeyNetwork(Links = S2021S2, Nodes = nodes2021S2,
 Source = "IDsource", Target = "IDtarget",
 Value = "value", NodeID = "name", colourScale=my_color)
p2021S2

...

```{r Overlaying multiple geom_lines and geom_points into one plot}

#Figure 5

allPOOR <- read_excel("File path")

meltedPOOR <- melt(allPOOR, id.vars = "Timepoint")

meltedPOOR$Timepoint <- factor(meltedPOOR$Timepoint, levels =
unique(meltedPOOR$Timepoint))

allMIDWAY <- read_excel("File path")

meltedMIDWAY <- melt(allMIDWAY, id.vars = "Timepoint")

meltedMIDWAY$Timepoint <- factor(meltedMIDWAY$Timepoint, levels =
unique(meltedMIDWAY$Timepoint))

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allGOOD <- read_excel("File path")

meltedGOOD <- melt(allGOOD, id.vars = "Timepoint")

meltedGOOD$Timepoint <- factor(meltedGOOD$Timepoint, levels =
unique(meltedGOOD$Timepoint))

ggplot() +
  geom_line(data = meltedVer2, aes(x = Timepoint, y = value, group =
variable, linetype = variable, colour = "Poor"), size = 0.5) +
  geom_line(data = meltedMIDWAY, aes(x = Timepoint, y = value, group =
variable, linetype = variable, colour = "Midway"), size = 0.5) +
  geom_line(data = meltedGOOD, aes(x = Timepoint, y = value, group =
variable, linetype = variable, colour = "Good"), size = 0.5) +
  ylab("Percentage of students") +
  geom_point(data = meltedVer2, aes(x = Timepoint, y = value, group =
variable, shape = variable, colour = "Poor"), size = 2.5) +
  geom_point(data = meltedMIDWAY, aes(x = Timepoint, y = value, group =
variable, shape = variable, colour = "Midway"), size = 2.5) +
  geom_point(data = meltedGOOD, aes(x = Timepoint, y = value, group =
variable, shape = variable, colour = "Good"), size = 2.5) +
  scale_colour_manual("Category", values = c("Good" = "#FF8B00",
"Midway" = "#d44995", "Poor" = "#0200C6")) + theme_classic() +

theme(axis.title.x=element_text(size=12),axis.title.y=element_text(si
ze=12),axis.text.x = element_text(colour = "black", size =12),
axis.text.y = element_text(colour = "black", size =12),
legend.position = "right", legend.direction = "vertical", legend.box
= "vertical", text = element_text(size=10), panel.border =
element_blank(),
  panel.grid.major = element_blank(),
  panel.grid.minor = element_blank(),
  panel.background = element_blank(),
  axis.line = element_line(colour = "black"))

```