Analysis of Teaching Evaluations

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1/28/2018

Contents

Data Import

Copied evaluation table, added quotes around the questions and imported into excel. Converted this to a csv file for import. Did this for both 2016 and 2017 teaching evaluations, downloaded from wolverine access.

```
library(readr)
library(dplyr)
data.2016.datafile <- '2016 Evaluations.csv'
data.2017.datafile <- '2017 Evaluations.csv'

input_col_types <- cols(
  Number = col_factor(levels=NULL),
  Question = col_factor(levels=NULL))

data.2016 <- read_csv(data.2016.datafile, col_types=input_col_types) %>% mutate(Year="2016")
data.2017 <- read_csv(data.2017.datafile, col_types=input_col_types)  %>% mutate(Year="2017")

te.data.wide <- full_join(data.2016,data.2017,
                      by = c("Number", "Question"),
                      suffix = c(".16", ".17"))

te.data <-
  rbind(data.2016,data.2017) %>%
  mutate(Total = SD+D+N+A+SA) %>%
  mutate(`Strongly Disagree`=SD/Total*100,
         `Disagree`=D/Total*100,
         `Neutral`=N/Total*100,
```

```
          `Agree`=A/Total*100,
          `Strongly Agree`=SA/Total*100)
```

The imported datafiles include:

- 2016 Evaluations.csv
- 2017 Evaluations.csv

Overall Questions

Overall, this was an excellent course.

```
overall.data <-
  te.data %>%
  filter(Number==1) %>%
  mutate(Item=as.factor(Year))

library(tidyr)
library(dplyr)

individualized.overall.data.agg <-
  te.data %>%
  dplyr::select(Question, Year, SA, A, N, D, SD) %>%
  dplyr::select(SA:SD,Question,Year) %>%
  gather(value=Number,key=Response,-Question,-Year) %>%
  group_by(Question,Year,Response) %>%
  expand(Count=seq(1:Number)) %>%
  mutate(Value = ifelse(Response=='SA', 5,
                        ifelse(Response=='A',4,
                               ifelse(Response=='N',3,
                                      ifelse(Response=='D',2,
                                             ifelse(Response=='SD',1,0))))))


question.summary <-
  individualized.overall.data.agg %>%
  group_by(Question,Year) %>%
  summarize(value.list = list(Value)) %>%
  spread(Year,value.list) %>%
  rename(First.Year=`2016`,
         Second.Year=`2017`) %>%
  group_by(Question) %>%
  mutate(First.mean=mean(unlist(First.Year)),
         Second.mean=mean(unlist(Second.Year))) %>%
  mutate(Change=Second.mean-First.mean) %>%
  filter(First.Year != 'NULL') %>%
  mutate(Mann.Whitney.p=wilcox.test(unlist(First.Year),unlist(Second.Year))$p.value,
         Mann.Whitney.t=wilcox.test(unlist(First.Year),unlist(Second.Year))$statistic) %>%
  arrange(Mann.Whitney.p) %>%
  dplyr::select(-First.Year,-Second.Year)

kable(question.summary,caption="Mann-Whitney Tests for teaching evaluation questions asked in both years
```

Table 1: Mann-Whitney Tests for teaching evaluation questions asked in both years.

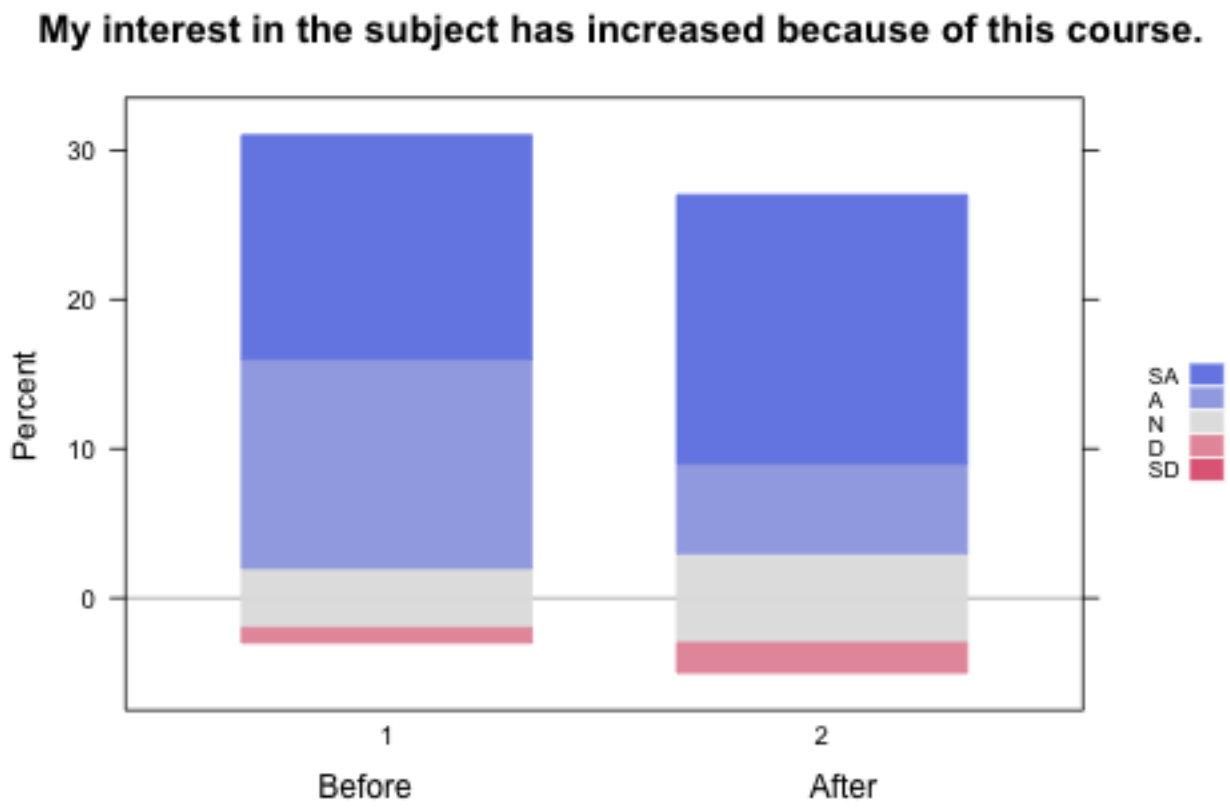
Question	First.mean	Second.mean	Change
The grades in this course were fairly determined.	3.82	4.31	0.487
I knew what was expected of me in this course.	3.79	4.17	0.377
Students felt comfortable asking questions.	4.14	4.39	0.250
Overall, this was an excellent course.	3.83	4.12	0.296
The course requirements were clearly defined.	4.06	4.25	0.194
The instructor presented material clearly in lectures/discussions.	3.85	4.06	0.214
Students' difficulty with the material was recognized.	3.78	4.03	0.253
My expected grade in this course is (SA=A, A=B, N=C, D=D, SD=E).	4.29	4.40	0.111
The instructor seemed well prepared for class meetings.	4.31	4.42	0.109
Graded assignments reflected the material covered.	3.88	4.06	0.173
I believe that my fellow students behaved ethically in this class.	4.20	4.28	0.078
Overall, the instructor was an excellent teacher.	4.00	4.16	0.156
The instructor explained material clearly.	3.85	4.03	0.183
I learned a great deal from this course.	4.16	4.24	0.077
This course advanced my understanding of the subject matter.	4.21	4.25	0.039
As compared with other courses of equal credit, the workload for this course was:	2.23	2.21	-0.029
My interest in the subject has increased because of this course.	4.08	4.06	-0.025
The instructor clearly explained expectations for ethical behavior in this class.	4.17	4.22	0.056
The instructor treated students with respect.	4.37	4.31	-0.066
I had a strong desire to take this course.	4.17	4.09	-0.078

```
write.csv(question.summary, file="Statistical Tests for Teaching Evaluations.csv")

library(HH)

plot.data <- overall.data[7:3]
rownames(plot.data) <- c("Before","After")

likert(plot.data, horizontal = FALSE,
       main = "Overall, this was an excellent course.",
       xlab = "Percent", # becomes ylab due to horizontal arg,
       ylab = c("Before","After"),
       title = "Overall, this was an excellent course.",
       auto.key = list(space = "right", columns = 1,
                       reverse = TRUE))
```

Learning

My interest in the subject has increased because of this course.

```
overall.data <-
  te.data %>%
  filter(Number==1632) %>%
  mutate(Item=as.factor(Year))

plot.data <- overall.data[7:3]
rownames(plot.data) <- c("Before","After")

likert(plot.data, horizontal = FALSE,
       main = "My interest in the subject has increased because of this course.",
       xlab = "Percent", # becomes ylab due to horizontal arg,
       ylab = c("Before","After"),
       title = "Overall, this was an excellent course.",
       auto.key = list(space = "right", columns = 1,
                       reverse = TRUE))
```

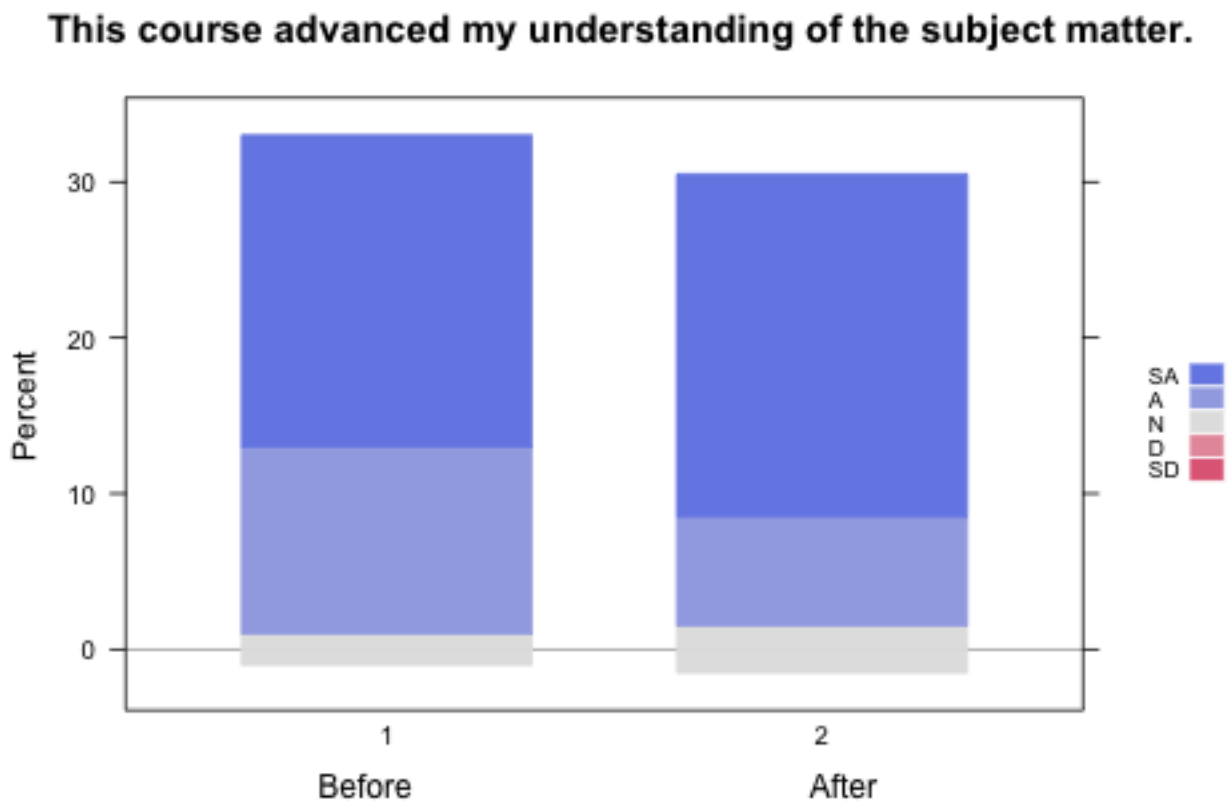


I learned a great deal from this course.

```
overall.data <-
  te.data %>%
  filter(Number==3) %>%
  mutate(Item=as.factor(Year))

plot.data <- overall.data[7:3]
rownames(plot.data) <- c("Before","After")

likert(plot.data, horizontal = FALSE,
       main = "I learned a great deal from this course..",
       xlab = "Percent", # becomes ylab due to horizontal arg,
       ylab = c("Before","After"),
       title = "Overall, this was an excellent course.",
       auto.key = list(space = "right", columns = 1,
                       reverse = TRUE))
```

This course advanced my understanding of the subject matter.

```
overall.data <-
  te.data %>%
  filter(Number==1631) %>%
  mutate(Item=as.factor(Year))

plot.data <- overall.data[7:3]
rownames(plot.data) <- c("Before","After")

likert(plot.data, horizontal = FALSE,
       main = "This course advanced my understanding of the subject matter.",
       xlab = "Percent", # becomes ylab due to horizontal arg,
       ylab = c("Before","After"),
       title = "Overall, this was an excellent course.",
       auto.key = list(space = "right", columns = 1,
                       reverse = TRUE))
```



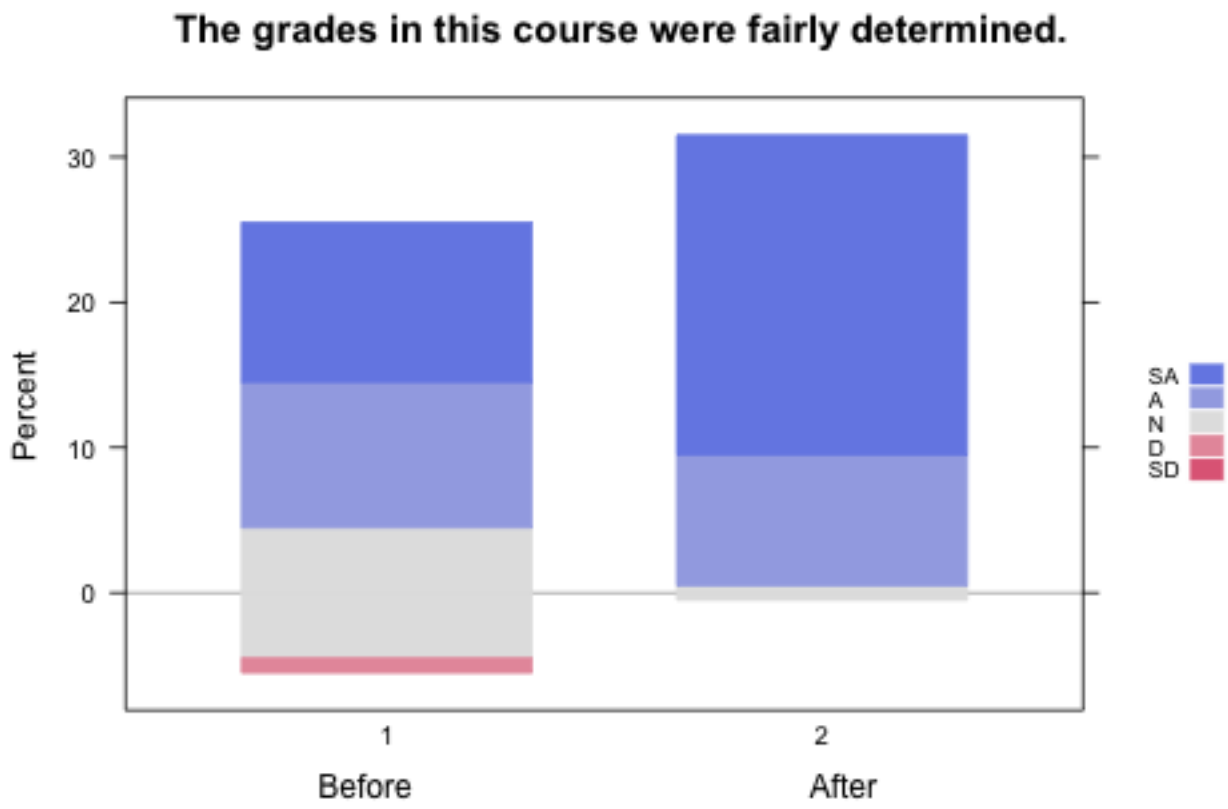
I learned a great deal from this course.

```
overall.data <-
  te.data %>%
  filter(Number==3) %>%
  mutate(Item=as.factor(Year))

plot.data <- overall.data[7:3]
rownames(plot.data) <- c("Before","After")

likert(plot.data, horizontal = FALSE,
       main = "I learned a great deal from this course.",
       xlab = "Percent", # becomes ylab due to horizontal arg,
       ylab = c("Before","After"),
       auto.key = list(space = "right", columns = 1,
                       reverse = TRUE))
```

Fairness in Grading

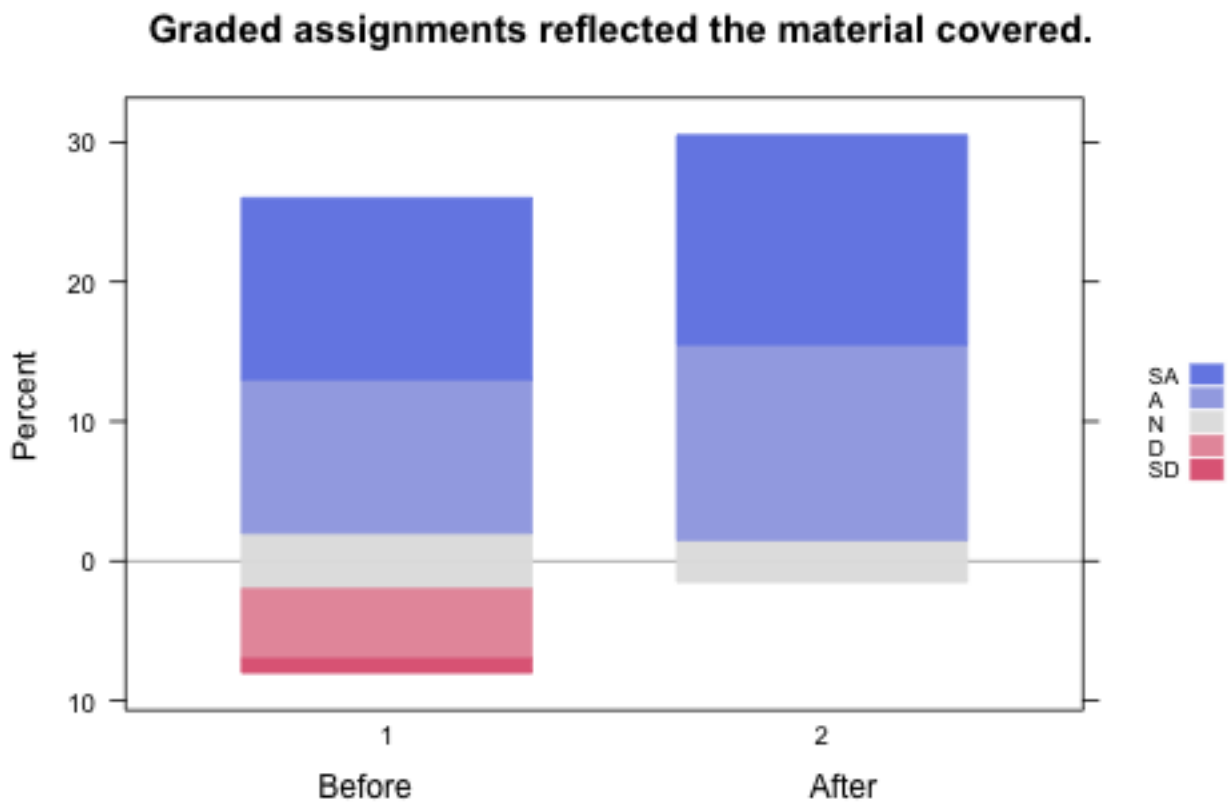
The grades in this course were fairly determined.

```
overall.data <-
  te.data %>%
  filter(Number==894) %>%
  mutate(Item=as.factor(Year))

plot.data <- overall.data[7:3]
rownames(plot.data) <- c("Before","After")

likert(plot.data, horizontal = FALSE,
       main = "The grades in this course were fairly determined.", # or give "title",
       xlab = "Percent", # becomes ylab due to horizontal arg,
       ylab = c("Before","After"),
       title = "Overall, this was an excellent course.",
       auto.key = list(space = "right", columns = 1,
                       reverse = TRUE))
```



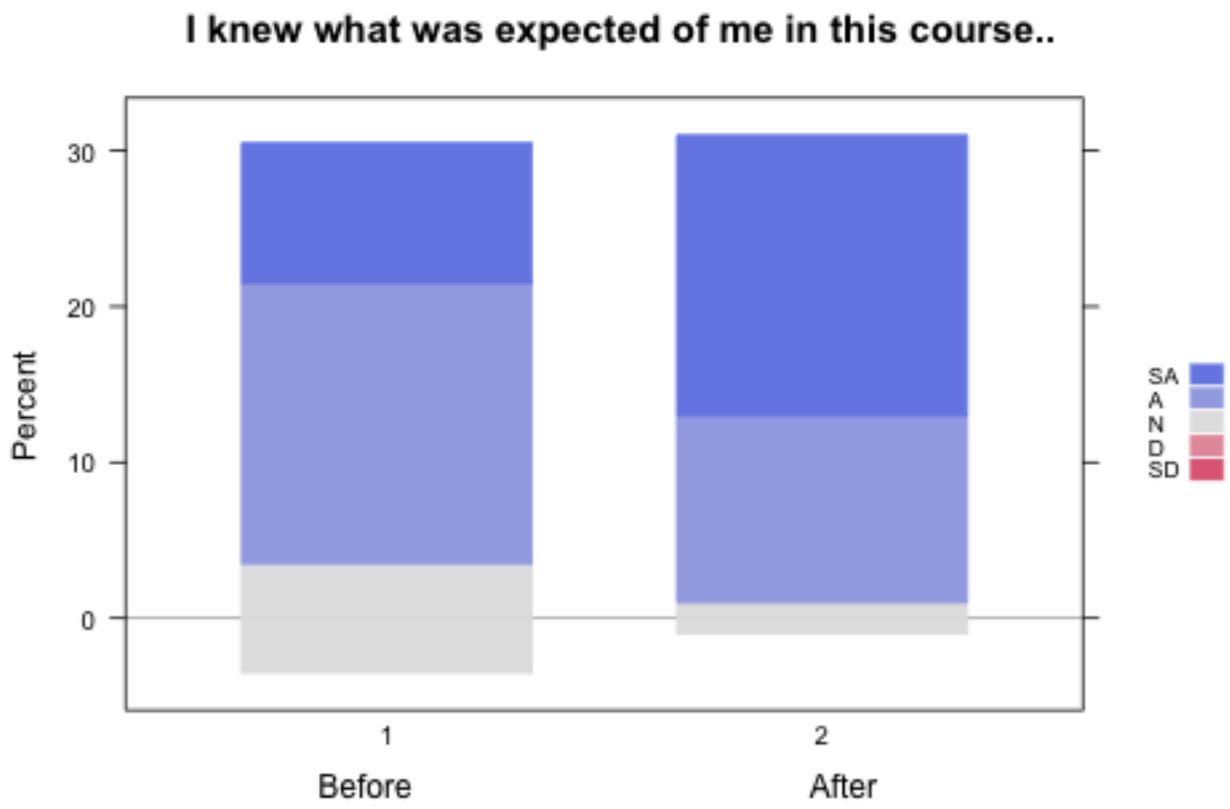
Graded assignments reflected the material covered

```
overall.data <-
  te.data %>%
  filter(Number==893) %>%
  mutate(Item=as.factor(Year))

plot.data <- overall.data[7:3]
rownames(plot.data) <- c("Before","After")

likert(plot.data, horizontal = FALSE,
       main = "Graded assignments reflected the material covered.", # or give "title",
       xlab = "Percent", # becomes ylab due to horizontal arg,
       ylab = c("Before","After"),
       title = "Overall, this was an excellent course.",
       auto.key = list(space = "right", columns = 1,
                       reverse = TRUE))
```



Knew what was expected of me

```
overall.data <-
  te.data %>%
  filter(Number==1633) %>%
  mutate(Item=as.factor(Year))

plot.data <- overall.data[7:3]
rownames(plot.data) <- c("Before","After")

likert(plot.data, horizontal = FALSE,
       main = "I knew what was expected of me in this course..", # or give "title",
       xlab = "Percent", # becomes ylab due to horizontal arg,
       ylab = c("Before","After"),
       title = "Overall, this was an excellent course.",
       auto.key = list(space = "right", columns = 1,
                       reverse = TRUE))
```



Workload

```
overall.data <-
  te.data %>%
  filter(Number==891) %>%
  mutate(Item=as.factor(Year))

plot.data <- overall.data[7:3]
rownames(plot.data) <- c("Before","After")

likert(plot.data, horizontal = FALSE,
       main = "As compared with other courses of equal credit, the workload of this course was:", # or
       xlab = "Percent", # becomes ylab due to horizontal arg,
       ylab = c("Before","After"),
       title = "Overall, this was an excellent course.",
       auto.key = list(space = "right", columns = 1,
                       reverse = TRUE))
```

npared with other courses of equal credit, the workload of this cours