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Utilizing the Intercultural Effectiveness Scale as an Assessment Tool to Gauge Undergraduate Intercultural Competencies

James J. Tanoos, Yangsai Lyu
PhD Clinical Assoc. Prof., SoET dept. Purdue Polytechnic Institute

1. Introduction

America's comparative geographic isolation from the rest of the world has led many of its citizens to lack global intercultural capabilities, as exemplified by high rates of failure among expatriates working on international assignments for their organizations. In efforts to solve this dilemma, American institutions of higher education have increasingly been integrating study abroad programs and globalization curricula into their coursework. Related assessment tools, such as the Intercultural Effectiveness Scale (IES), have been developed to help instructors to better evaluate students' intercultural skillsets. These instruments allow academic practitioners to better understand and nurture global awareness and intercultural capabilities in order to plan curricula that best match students' skill levels and areas of need related to intercultural competencies. This study utilized the IES pre- and post-surveys during an introductory globalization course to understand student capabilities and better predict overall student intercultural competencies.

Keyword: intercultural competencies, expatriate, intercultural effectiveness scale, global awareness

2. Literature Review

Wiseman (2003, p. 422) defined intercultural awareness as an "ability to discriminate and experience relevant cultural differences" and pointed out that America's relative isolation from the rest of the world exacerbates Americans' lack of intercultural awareness, which is manifest when they work and travel abroad. However, most American expatriate failures result from the employee's inability to adjust to the new culture, and a lack of organizational focus on cultural training and adjustments have been commonly indicated as integral reasons for these failures (Selmer, 1995; Harris, 2008; Weber, 2013). Harris (2008, p. 184) pinpointed that the key to success in a typical expatriate assignment is "extra-cultural" openness.

More Americans than ever are working abroad, as "the 21st century is one of unremitting globalization" (Mendenhall et al., 2008, p. 3), but they often face major challenges in adjusting to the new culture. Lowe (2005) suggested that the job performance of American expatriates often suffers as a result of not feeling comfortable in their new environment, while Breiden et al. (2004) found those who adjust well to the new culture also tend to be more committed to the organization. There has been a great deal of research about how to best integrate American expatriates into a new global culture (Moore & Mehlenbacher, 2009; Tang & Chao, 2010; Reish, 2011; Charles & McNulty; 2014; Deardorff, 2015; McNulty & Selmer, 2017). This study will define international competence as "a complex of abilities needed to perform effectively and appropriately when interacting with others who are linguistically and culturally different from oneself" (Fantini & Fantini, 2006, p. 12).

Millennials, the generation who grew up during the advent of the internet, are said to have a generational and cultural gap from other Americans, especially Baby Boomers (Freedlander, 2021; Petersen, 2021). In fact,

millennial Americans' ability to integrate with other generations of coworkers (even within their home culture) remains a "widespread concern" (Myers & Sadaghiani, 2010, p. 225). Nevertheless, they want to "work abroad at some point in their career" (Ubl et al., 2017, p. 53) and are now signing up for global assignments more than other generations of Americans (Herbert, 2016; Vargas, 2017; Shadovitz, 2018; Prime, 2020; Wiles, 2020). While all Americans tend to have a difficult time assimilating in an organizational setting abroad, the technological savviness of Millennials is making these new assignments even more challenging because a digital divide is said to exist, by which a lack of access to modern technologies connecting these employees to the home office of the organization tends to inhibit the organizational success of Millennial expatriates (FIDI, 2017). As this generation is increasingly being integrated into organizational assignments in other countries, organizations must select those who are best equipped to handle the stresses of living abroad. As such, gaining a solid understanding of how to integrate into new cultures while they are in college is an absolutely essential component of their career development (Ng et al., 2010; Cahn & Cahn, 2016; Taylor, 2016).

In response to the lack of general global cultural awareness among American students, Bates and Atef-Rehal (2017) surmised that "higher education practitioners and educators should prioritize intercultural competency education" (p. 43). Because of this phenomenon, universities across the US have been integrating intercultural curricula into their coursework over the past several decades in attempts to provide opportunities to remedy this lack of experience in immersion into unique international cultures. These efforts also include offering more study abroad (SA) programs. Badstübner and Ecke (2009, p. 41) noted that "cultural understanding is acquired most effectively" while being immersed in a SA environment. However, simply sending students abroad does not necessarily allow them to immerse themselves in other cultures, as Brubaker (2007, p. 118) commented that it is the responsibility of the SA leader to "support the need for integrating culture learning into short term study abroad" programs during the planning stages of the trip. An understanding of students' overall cultural awareness and competency is needed even before these trips begin to be planned.

Pedagogy in higher education has increasingly utilized assessment tools to gauge student development and understanding (National Academies Press, 2017; Zlatkin-Troitschanskaia et al., 2017; Zlatkin-Troitschanskaia et al., 2018; McConlogue, 2020; Alt & Raichel, 2021). These assessment instruments have been developed to assess student competencies in various disciplines so that related curriculum can best allow students to learn and develop at an appropriate skill level. While some capabilities such as math acumen are fairly easy to gauge, assessment of intercultural development has been "plagued with problems of conceptual ambiguity and the lack of valid instruments for measuring" (Portalla & Chen, 2010, p. 21). Griffith et al. (2016, p. 1) stated that "the current state of the literature [is] murky in terms of the clarity of the ICC (intercultural competence construct)".

Instruments to measure intercultural competencies have taken on a variety of forms. The AAC&U Intercultural Knowledge & Competence Value rubrics identify various levels of criteria for a variety of global outcomes (University of Michigan, 2021). The, the Intercultural Development Inventory is another commonly used barometer of individual cross-cultural competence (University of Michigan, 2021). The Developmental Model of Intercultural Sensitivity is a framework created to assess reactions to differences in culture (Bennett, 1993; Sinicrope et al., 2007). Arasaratnam and Doerfel (2005) developed an assessment tool using a bottom-up approach to assess intercultural competence by interviewing students and identified 10 unique dimensions of intercultural communicative competence.

The Intercultural Effectiveness Scale (IES) was derived from an assessment of intercultural effectiveness by Hammer, Gudykunst, and Wiseman (1978) "to determine an individual's ability to acclimate and function in another culture" (Portalla & Chen, 2010, p. 47). The IES was created based on 76 related aspects of intercultural effectiveness (Portalla & Chen, 2010) and pinpoints competencies found to be most important when interacting with those from different cultural backgrounds. It is administered as a pre- and post-survey whose output quantifies three distinct dimensions of student development in intercultural competencies: continuous learning, interpersonal engagement, and hardiness. These multifaceted dimensions of the IES represent the "various factors that influence an individual's behavior strategies" (Portalla & Chen, 2010, p. X). When combined, they create a composite interculturalism score that predicts intercultural effectiveness for the individuals taking the survey.

The IES has been said to offer "strong support for the conceptual formulation of the three-factor framework" (Mendenhall et al., 2008, p. 11). This intercultural score predicts success in other cultures and can be developed over time, whereas travel experiences tend to enhance IES scores. Bates and Rehal (2017) surmised that the "IES is a useful tool to measure intercultural skills and growth" (p. 52). It "can be used in contexts such as those found in many educational settings" (Mendenhall et al., 2008, p. 6) and has been used to assess employees in industry (Özdemir, 2017; Yilmaz et al., 2020) as well as in higher education to assess student needs and challenges (Xiang, 2012; Wang & Ching, 2015; Nguyen, 2017; Bates & Rehal, 2017; Armstrong, 2020).

Through IES output within higher education, practitioners have been better able to identify student skillsets and needs as they relate to intercultural competencies. At the same time, students are able to learn about their own tendencies related to intercultural acumen along with areas of opportunities, and their instructors are able to better understand students' skill levels and areas of need as they determine the appropriate rigor of their global curricula.

3. Methodology & Results

This study utilized the IES pre- and post-surveys administered during a 6-week introduction to globalization distance course during the summer of 2021. The sample consisted of 20 undergraduate students at a land-grant institution of higher education. The instructor obtained human subjects research certification through the institution's institutional review board, and a colleague of the instructor digitally administered the IES pre-survey at the beginning of class and the post-survey at the end of the class. Upon completion and processing of the IES, instructors receive cumulative group profile scores for the three dimensions that all contribute to the overall IES score as well as the three interrelated intercultural dimensions (see appendix 1). Cumulative student scores were provided for the three dimensions as well as how scores in those dimensions factored into the overall IES score, as seen in the pre-survey and post-survey output in Tables 1 and 2.

Table 1. *IES Pre-survey output*

	Low		Moderate			High	
	1	2	3	4	5	6	7
Continuous Learning	1	2	4	8	4	0	1
Self Awareness	1	2	7	6	3	0	1
Exploration	1	3	4	4	7	1	0
Interpersonal Engagement	4	8	4	3	0	1	0
World Orientation	7	5	4	3	1	0	0
Relationship Development	5	6	2	1	2	2	2
Hardiness	4	5	5	2	4	0	0
Positive Regard	2	4	3	4	5	0	2
Emotional Resilience	6	7	1	3	1	2	0
Overall Intercultural Effectiveness Scale	3	8	5	2	2	0	0

Table 2. *IES Post-survey output*

	Low		Moderate			High	
	1	2	3	4	5	6	7
Continuous Learning	0	1	7	2	2	5	3
Self Awareness	2	1	2	4	4	4	3
Exploration	0	5	2	4	4	1	4
Interpersonal Engagement	4	3	5	3	3	2	0
World Orientation	4	3	0	6	5	2	0
Relationship Development	5	3	6	1	1	4	0
Hardiness	2	4	2	5	3	3	1
Positive Regard	3	4	1	3	4	3	2
Emotional Resilience	2	5	1	4	4	3	1
Overall Intercultural Effectiveness Scale	2	3	5	4	1	4	1

A graphical illustration of same-student scores for the pre- and post-surveys based on matching-pair output data at the two different time points is presented in Figures 1 through 4. The post-survey scores were higher than the pre-survey scores for most students in all four categories.

Figure 1. *Matching pair data for the "continuous learning" dimension*

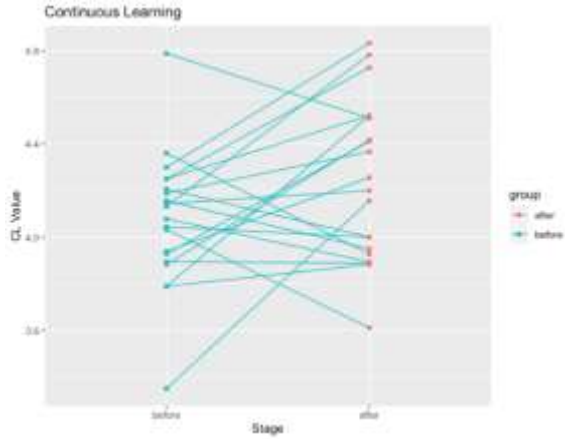


Figure 2. *Matching pair data for the "interpersonal engagement" dimension*

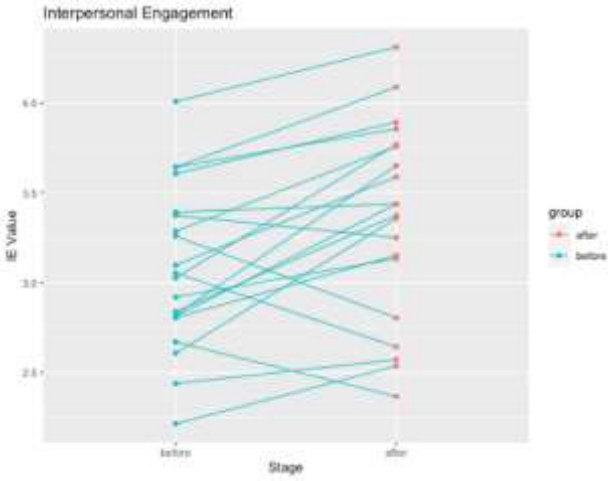


Figure 3. *Matching pair data for the "hardiness" dimension*

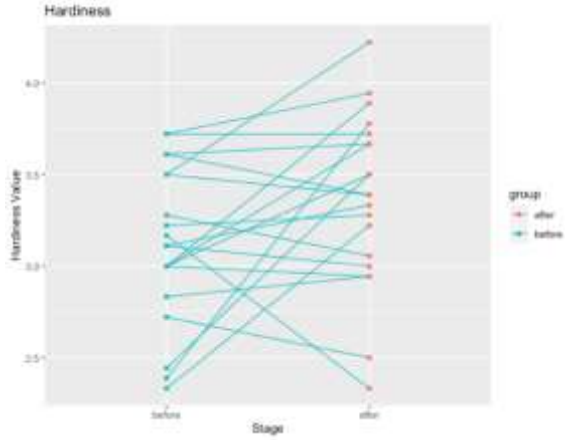
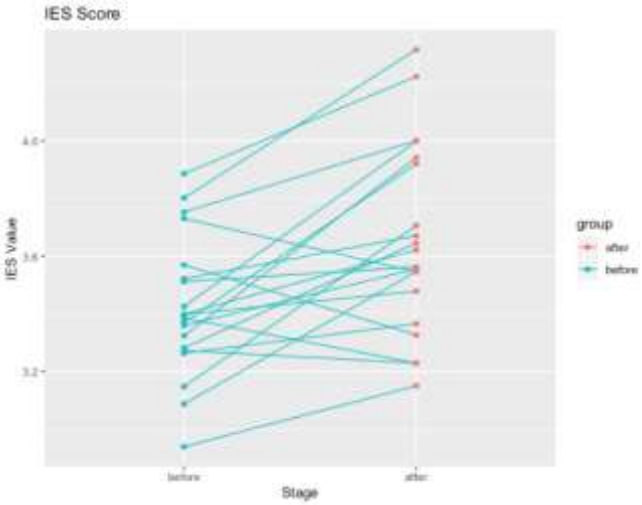


Figure 4. *Matching pair data for the cumulative IES score*



The paired *t*-test experimental design is preferred when assessing changes between two variables at different points in time, but this test is only prudent when the differences between the two points are normally distributed. Since this study collected data from students via pre- and post-surveys at the beginning of the course and at the end of the course, The Shapiro-Wilk text was performed to test for normality of changes in order to first determine if the changes for the four categories were normally distributed. Table 3 shows the *p*-values from the Shapiro-Wilk test.

Table 3. *P-values from the Shapiro-Wilk test*

Categories	***p*-values**
Continuous Learning	0.3936
Interpersonal Engagement	0.3108
Hardiness	0.3829
IES	0.3753

Since the null hypothesis of the Shapiro-Wilk test states that the data are normally distributed and all four *p*-values in the table above are larger than 0.05, we cannot reject the null hypothesis. Thus, we can claim that the differences for each of the four categories are normally distributed. Since this standard normality assumption has been met, we were able to subsequently utilize the paired *t*-test to test for the significance of the changes between pre- and post-survey scores. Table 4 depicts the *p*-values from the paired *t*-test. The significance level was set as 0.1 instead of 0.05 because the number of observations in this sample set is comparatively small. All four differences in scores are deemed to be significant at a 0.1 significance level.

Table 4. *P-values from the two-sided paired t-test*

Categories	***p*-values**
Continuous Learning	0.0681
Interpersonal Engagement	0.0040
Hardiness	0.0530
IES	0.0010

Next, the hidden relationships between the changes in pre- and post-survey scores for the three dimensions as well as the changes in overall IES scores were examined. The goal was to find associations between those changes, so that the relationship can be utilized to predict future IES scores based on just the pre-survey scores in the three categories. Figures 5 through 7 show the relationships between the changes in each category with respect to the change in IES score. For the interpersonal engagement and hardiness dimensions, a positive change in pre- and post-survey scores will lead to a positive change in IES score as well. However, that pattern is not apparent for the continuous learning dimension; some students had a negative change in pre- and post-survey score, but the change in their overall IES score is still positive.

Figure 5. *Plots of relationships between changes in CL with changes in IES*

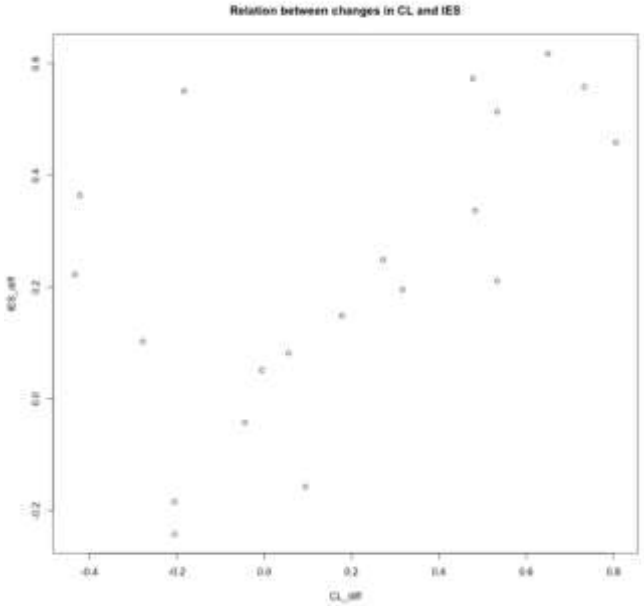


Figure 6. *Plots of relationships between changes in IE with changes in IES*

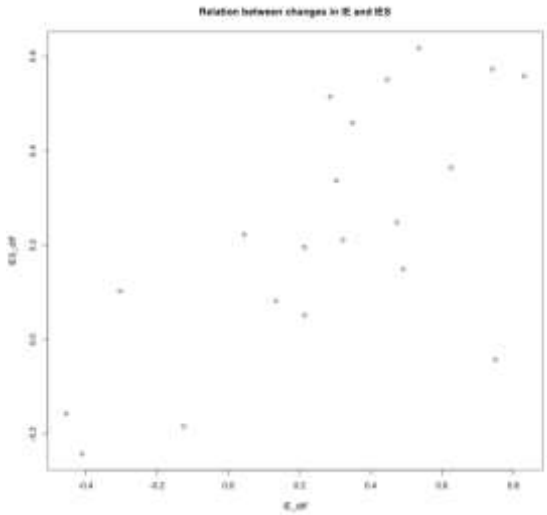


Figure 7. *Plots of relationships between changes in HA with changes in IES*

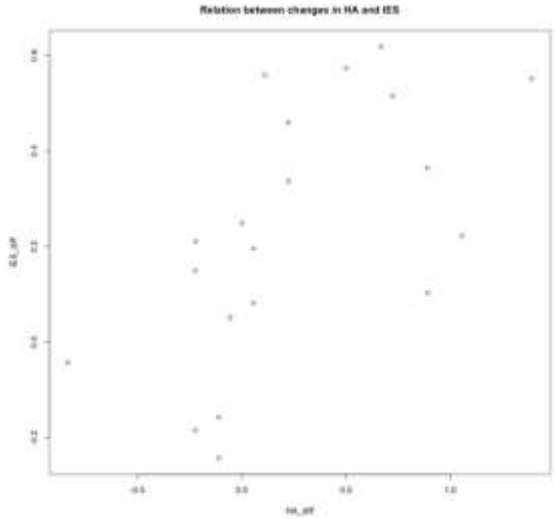


Table 5 shows the correlation between the changes in the three dimensions as they related to the changes in overall IES score. The correlation statistics in the table indicate the same relationship as illustrated in the plots above. Compared to continuous learning, both interpersonal engagement and hardiness have stronger positive relationships with the overall IES score. This means that if the student has a positive change in interpersonal engagement or hardiness score, then it could confidently be predicted that the student will have a positive change in IES score as well.

Table 5. *Correlations between changes in CL, IE, HA, and changes in IES*

Categories	**Correlation with changes in IES**
Continuous Learning	0.5551
Interpersonal Engagement	0.6940
Hardiness	0.5943

Based on the one-sided and two-sided paired *t*-tests of significance and from the test results, it can be stated that there is a significant difference between the pre- and post-survey scores in continuous learning, interpersonal engagement, hardiness, and IES. This indicates that curricular aspects of globalization may have affected the students' development in these dimensions during the duration of the globalization course. Based on the plots and correlation analysis which tested the relationships between the changes in pre- and post-survey scores in the four categories, we can conclude that there are strong linkages between changes in interpersonal engagement and hardiness as they relate to changes in overall IES scores. For the interpersonal engagement and hardiness dimensions, a positive change in pre- and post-survey scores will lead to a positive change in IES score as well due to their strong positive relationship with the overall IES score.

In particular, changes in interpersonal engagement scores predicted similar changes in overall IES scores. This conclusion makes it possible to predict the change in IES score if the change in interpersonal engagement score from a student is known. Since the intercultural engagement dimension reflects world orientation and relationship development, further analysis on these two sub-areas may shed some light on the factors that are inherent in the final IES score, whereas relationship interest includes a willingness to develop new friends and maintain those friends. As such, those that seek out new friendships, or extroverts might be considered for potential high intercultural competencies.

Additional characteristics of hardiness that might be analyzed further include sub-aeras of open-mindedness and emotional resilience. Since the IES states that resilience involves tendencies to cope well with emotional situations and an ability to better recover from setbacks, features of personality traits associated with bouncing back from life setbacks could be an interesting avenue to pursue as it relates to intercultural

competencies. Finally, whether these particular skillsets that can change and improve over time would be interesting routes for future studies.

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INFO

Corresponding Author: ***James J. Tanoos, PhD Clinical Assoc. Prof., SoET dept. Purdue Polytechnic Institute.***

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Appendix A.

Overview of IES

Overview of the IES

A Quick Summary

The IE assesses:

- how we learn about another culture and the accuracy of that learning
- our orientation toward developing and managing relationships with people from other cultures
- how we manage the challenges and stress involved in interacting within a different cultural environment

The IES provides an assessment of the degree to which students possess competencies that are critical to interacting effectively with people from other cultural backgrounds.

The IES focuses on three dimensions of intercultural effectiveness, and these three dimensions are combined to generate an **Overall Intercultural Effectiveness Score** in the individual feedback report.

The first dimension assessed by the IES is **Continuous Learning**. This dimension examines how people cognitively approach cultural differences, and the degree to which individuals engage the world by continually seeking to understand themselves and also learn about the activities, behavior, and events that occur in the cross-cultural environment.

Additionally, this dimension examines people's tendency to be rigid in their view of cultural differences, their tendency to be judgmental about those differences, and their ability to deal with complexity and uncertainty.

The second dimension assessed by the IES is **Interpersonal Engagement**. Developing positive intercultural relationships depends in large part on one's interest in learning about people from other cultures, their customs, values, etc.

This aspect of relationship development is assessed in the IES along with the degree to which individuals have the desire and willingness to initiate and maintain relationships with people from other cultural backgrounds.

The final dimension is **Hardiness**. Interacting with people from different cultural backgrounds requires significant effort, which often produces stress, anxiety, and sometimes fear.

This dimension assesses the degree to which individuals are able to wait to understand a situation or person versus the tendency to make snap judgments, which can produce anxiety and stress in cross-cultural relationships.

This dimension also assesses the degree to which individuals can manage and control their emotions, learn from their mistakes, and emotionally rebound from setbacks.

2

Appendix B.

R-Codes

```r
library(ggplot2)
library(dplyr)


## import data
library(readxl)
data <- read_excel("~/Desktop/Data.xlsx")
View(data)


## change index on the Time column
for (i in (1:48)){
  if (data$Time[i] == 1){
    data$Time[i] = "before"
  }else {
    data$Time[i] = "after"
  }
}
group_order <- c("before","after")




#### Continuous Learning
CL <- data.frame(
  student = data$`Student Code`,
  group = data$Time,
  value = round(data$`Continuous Learning (Average)`,3)
)
CL_diff <- c(-0.005555556, -0.205555556, 0.650000000, -0.183333333, -0.044444444,
             0.177777778, -0.285555556, 0.733333333, 0.316666667, -0.277777778, 0.533333333,
             0.055555556, -0.433333333, 0.094444444, 0.272222222, -0.422222222, 0.477777778,
             0.533333333, 0.805555556, 0.483333333)

## draw graphs
# line graph
ggplot(CL, aes(x=factor(group, level = group_order), y=value, group=student)) +
  geom_line(aes(color=group))+
  geom_point(aes(color=group))+
  labs(title="Continuous Learning",x="Stage", y = "CL Value")


## compute t test
# check for normality
with(CL, shapiro.test(value[group == "before"]))
with(CL, shapiro.test(value[group == "after"]))
shapiro.test(CL_diff)
# the difference is normal, so we would consider using a paired-t-test

## two-sided t-test
res <- t.test(value ~ group, data = CL, paired = TRUE)
res
## p-value equals 0.06808

## one-sided t-test
# test whether the difference is greater than 0
res_1 <- t.test(value ~ group, data = CL, paired = TRUE, alternative = "greater")
res_1
# p-value = 0.03404
```

```r


#### Interpersonal Engagement
IE <- data.frame(
  student = data$`Student Code`,
  group = data$Time,
  value = round(data$`Interpersonal Engagement (Average)`,3)
)
IE_diff <- c(0.21428571, -0.41071429, 0.53571429, 0.44642857, 0.75000000, 0.49107143, -0.12500000,
             0.83035714, 0.21428571, -0.90357143, 0.28571429, 0.13392857, 0.04464286, -0.45535714,
             0.47321429, 0.62500000, 0.74107143, 0.32142857, 0.34821429, 0.30357143)

## draw line graph
ggplot(IE, aes(x=factor(group, level = group_order), y=value, group=student)) +
  geom_line(aes(color=group))+
  geom_point(aes(color=group))+
  labs(title="Interpersonal Engagement",x="Stage", y = "IE Value")

## compute t-test
shapiro.test(IE_diff)
# p-value is greater than 0.05, thus the difference is normally distributed


## two-sided t-test
res1 <- t.test(value ~ group, data = IE, paired = TRUE)
res1
## p-value equals to 0.001992

## one-sided t-test
res1_1 <- t.test(value ~ group, data = IE, paired = TRUE, alternative="greater")
res1_1
# p-value = 0.0020




#### Hardiness
HA <- data.frame(
  student = data$`Student Code`,
  group = data$Time,
  value = round(data$`Hardiness (Average)`,3)
)
HA_diff <- c(-0.05555556, -0.11111111, 0.66666667, 1.38888889, -0.83333333, -0.22222222, -0.22222222,
             0.11111111, 0.05555556, 0.88888889, 0.72222222, 0.05555556, 1.05555556, -0.11111111, 0,
             0.88888889, 0.50000000, -0.22222222, 0.22222222, 0.22222222)


## draw line graph
ggplot(HA, aes(x=factor(group, level = group_order), y=value, group=student)) +
  geom_line(aes(color=group))+
  geom_point(aes(color=group))+
  labs(title="Hardiness",x="Stage", y = "Hardiness Value")


## compute t-test
shapiro.test(HA_diff)
# p-value is greater than 0.05, thus the difference is normally distributed


##  two-sided paired-t-test
res2 <- t.test(value ~ group, data = HA, paired = TRUE)
res2
# p-value equals 0.05298

## one-sided t-test
res2_2 <- t.test(value ~ group, data = HA, paired = TRUE, alternative="greater")
res2_2
# p-value = 0.0265




#### Overall IES Score
IES <- data.frame(
  student = data$`Student Code`,
  group = data$Time,
  value = round(data$`Overall IES Score (Average)`,3)
)
IES_diff <- c(0.05105820, -0.24240052, 0.61746032, 0.55066138, -0.04259259, 0.14867566, -0.18425926, 0.55026720,
              0.19550265, 0.10251323, 0.51375661, 0.08167989, 0.22228836, -0.15734127,0.24847884, 0.36388889,
              0.57294974, 0.21084656, 0.45066402, 0.33637566)


## draw line graph
ggplot(IES, aes(x=factor(group, level = group_order), y=value, group=student)) +
  geom_line(aes(color=group))+
  geom_point(aes(color=group))+
  labs(title="IES Score",x="Stage", y = "IES Value")


## compute t-test
shapiro.test(IES_diff)
# p-value is greater than 0.05, thus the difference is normally distributed


## two-sided paired t-test
res3 <- t.test(value ~ group, data = IES, paired = TRUE)
res3
# p-value is 0.001012

## one-sided t-test
res3_3 <- t.test(value ~ group, data = IES, paired = TRUE, alternative="greater")
res3_3
# p-value = 0.0005




#### Prediction
## use linear regression to build prediction model
## seperate the pre and post survey data
CL_pre <- CL$value[CL$group=="before"]
CL_post <- CL$value[CL$group=="after"]
IE_pre <- IE$value[CL$group=="before"]
IE_post <- IE$value[CL$group=="after"]
```

```
HA_pre <- HAivalue[CL$group=="before"]
HA_post <- HAivalue[CL$group=="after"]
IES_pre <- IESivalue[CL$group=="before"]
IES_post <- IESivalue[CL$group=="after"]

## first draw plots to illustrate relationships
plot(IES_pre ~ CL_pre)


## build linear regression model using changes in 3 categories
lm <- lm(IES_diff ~ CL_diff + IE_diff + HA_diff)
summary(lm)
plot(lm)
## it is meaningless to use a linear regression here since the IES difference is the average total of the other three
plot(CL_diff,IES_diff, main="Relation between changes in CL and IES")
plot(IE_diff,IES_diff, main="Relation between changes in IE and IES")
plot(HA_diff,IES_diff, main="Relation between changes in HA and IES")

## find correlations
cor(CL_diff, IES_diff, method="pearson")
cor(IE_diff, IES_diff, method="pearson")
cor(HA_diff, IES_diff, method="pearson")
```