Student Demographics & Foundations

Setup & Data Import

```
## [[1]]
## [1] "dplyr"     "stats"     "graphics"  "grDevices" "utils"     "datasets"
## [7] "methods"   "base"
##
## [[2]]
## [1] "ggplot2"   "dplyr"     "stats"     "graphics"  "grDevices" "utils"
## [7] "datasets"  "methods"   "base"
##
## [[3]]
##  [1] "scales"    "ggplot2"   "dplyr"     "stats"     "graphics"  "grDevices"
##  [7] "utils"     "datasets"  "methods"   "base"
```

Overall Age Distribution

```
## The majority of TUMO students are between 12 and 16 years old, with a clear peak at age 13.
```

Age Distribution by Gender

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## Male and female students share nearly identical age profiles, both peaking at 13, indicating no gende
```

Student Classification Counts by Gender

```
## Classification T and U dominate (~70% total), M and O are smaller, and null (just registered) is mini
```

Boxplot of Age per Classification

```
## Students in T are the youngest (median ~12), followed by U, M, and O; O shows the greatest age varial
```

Age by Classification & Gender

```
## Within each classification, male and female ages overlap heavily; no gender-specific outliers.
```

Age Density by Gender

```
## Density curves for male and female are virtually identical-both peak at 13 and taper similarly.
```

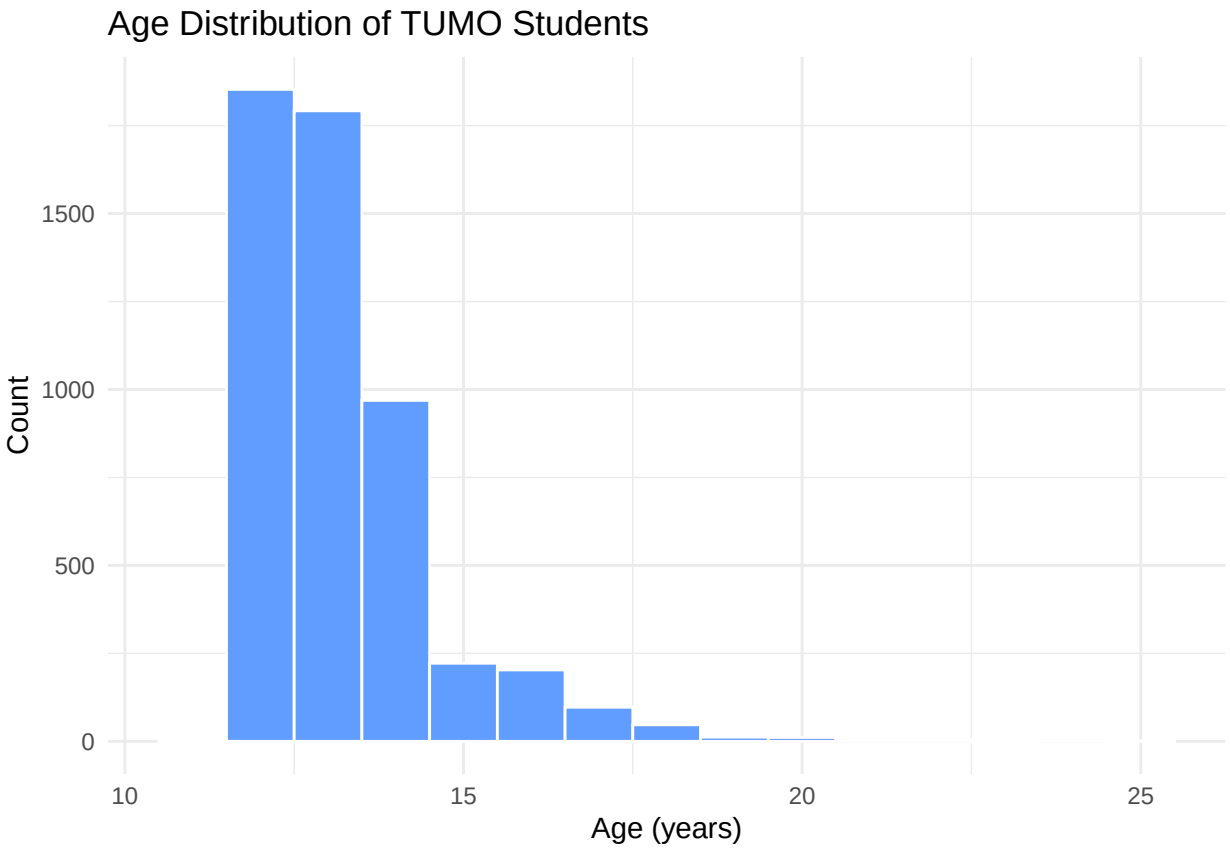

Figure 1: Overall Age Distribution

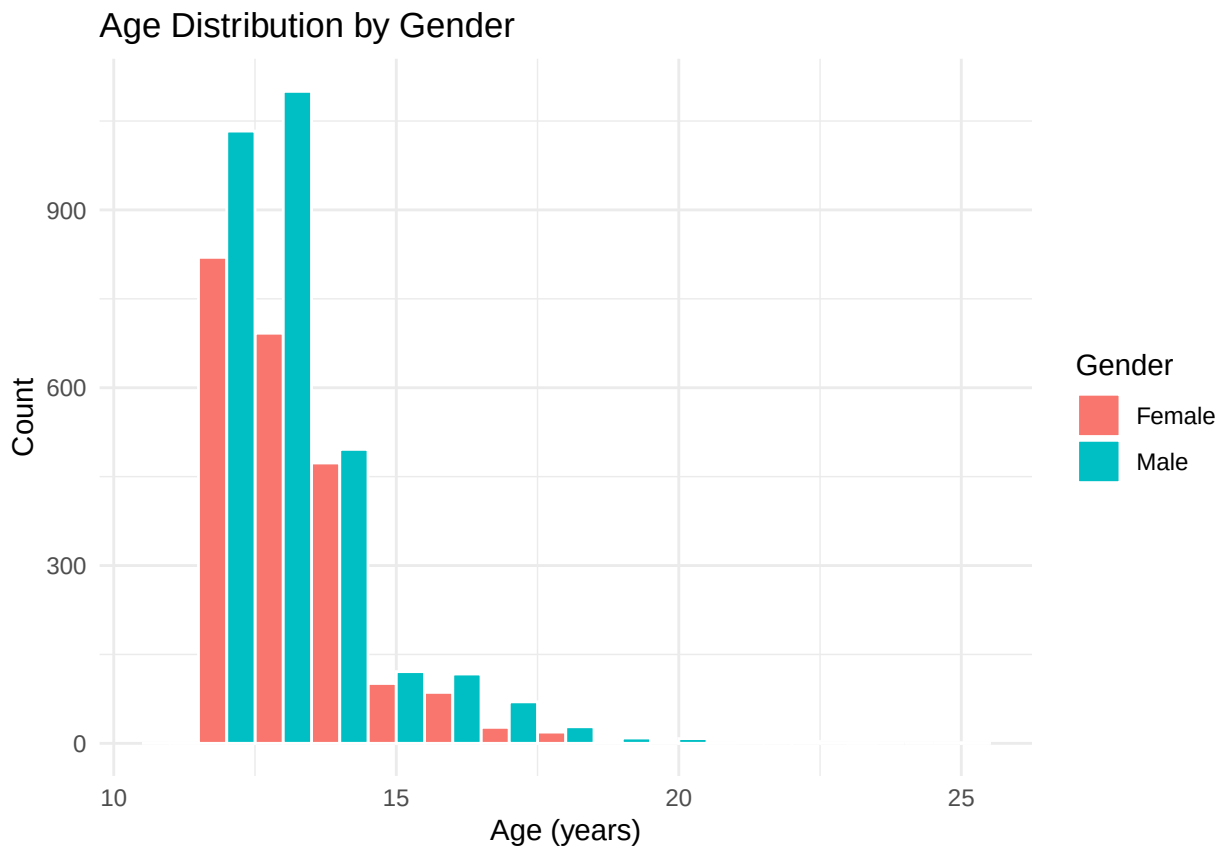

Figure 2: Age Distribution by Gender

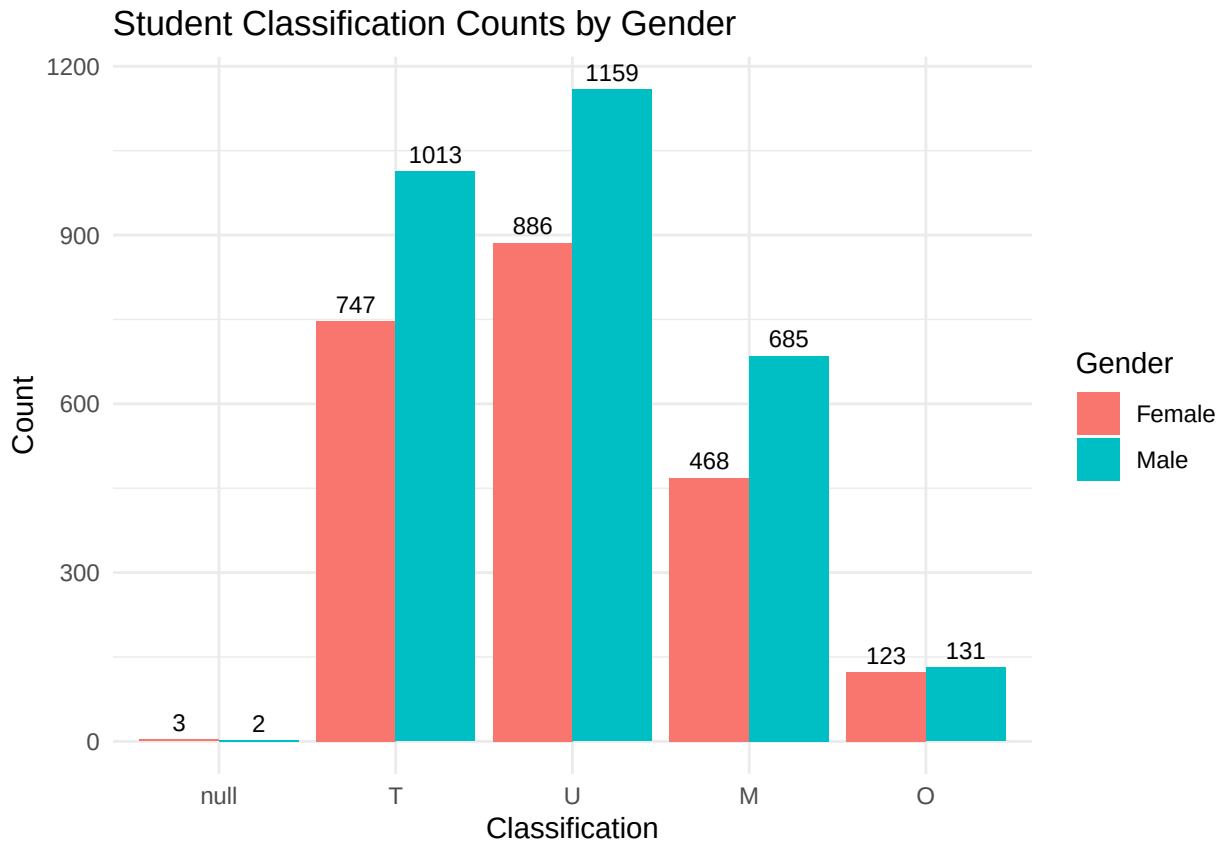

Figure 3: Student Classification Counts by Gender

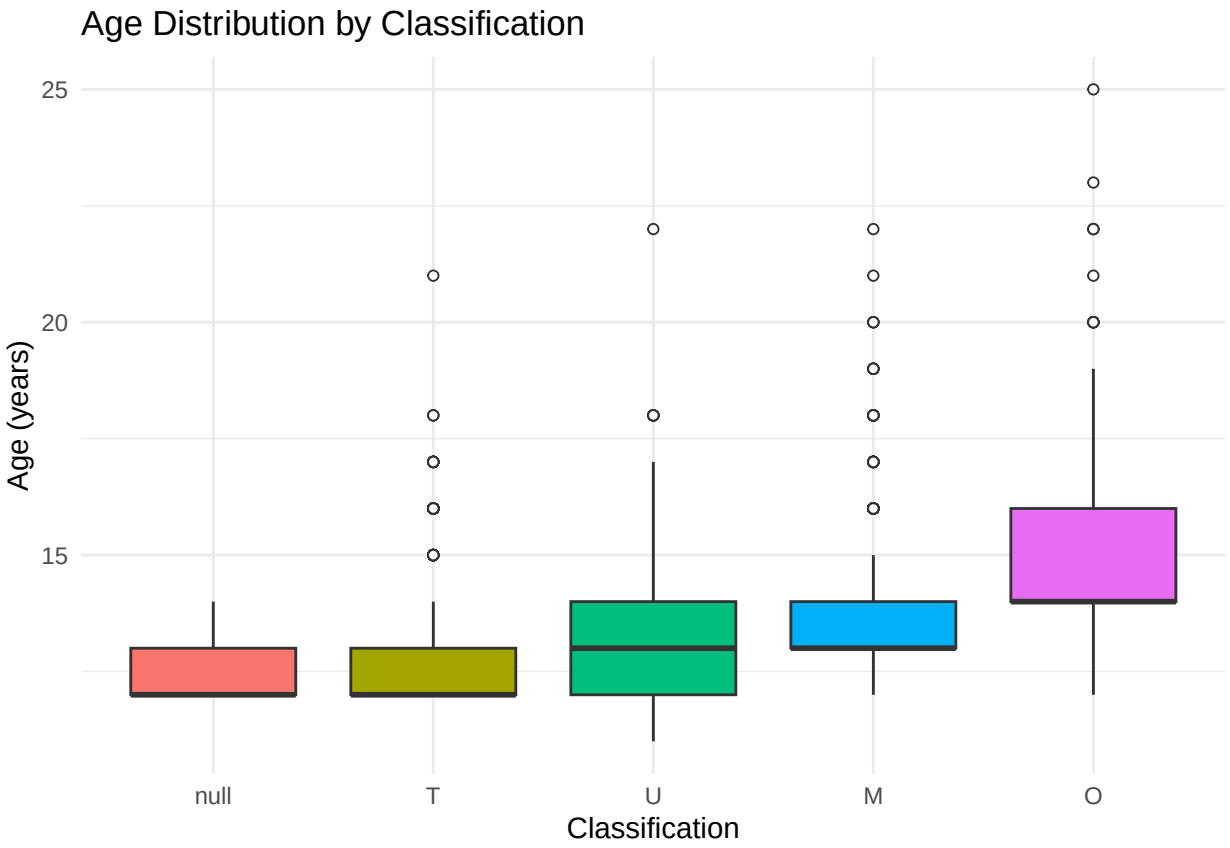

Figure 4: Boxplot of Age by Classification

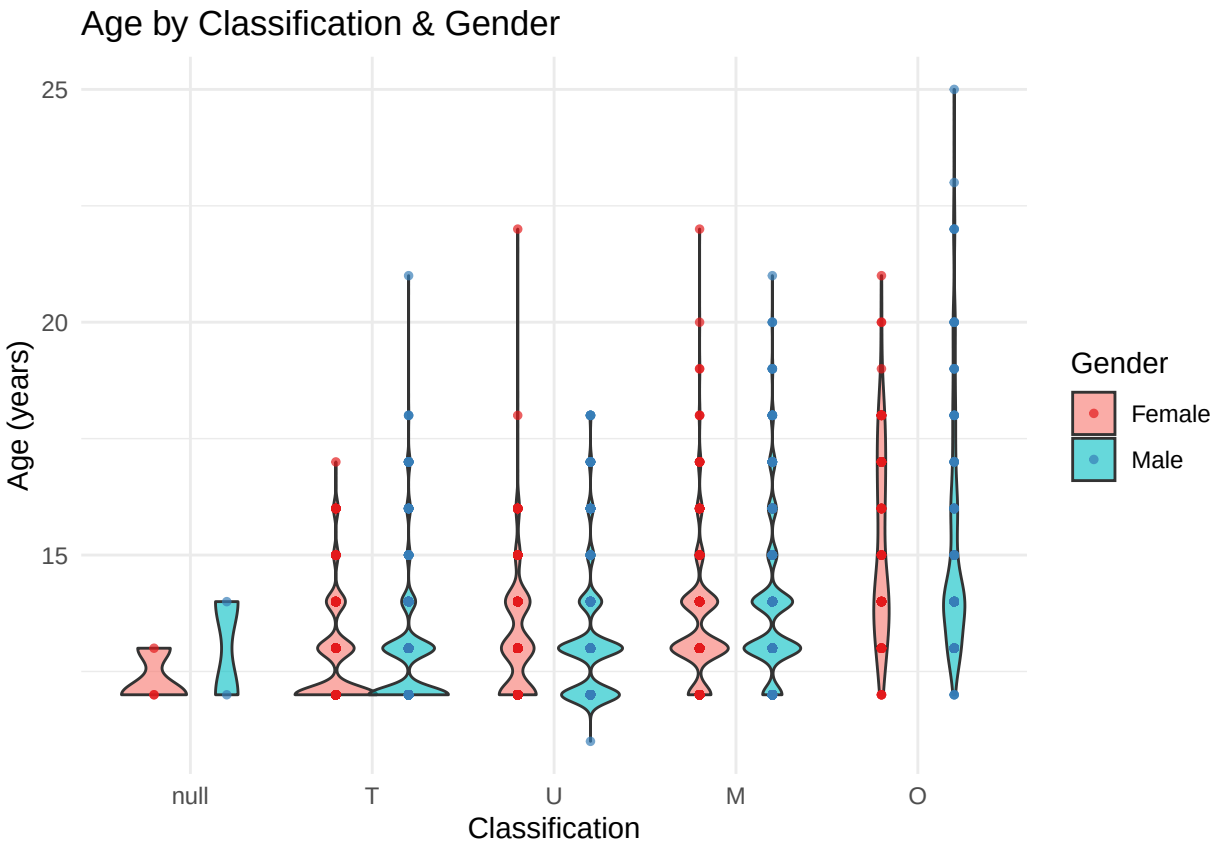

Figure 5: Violin + Jitter: Age by Classification & Gender

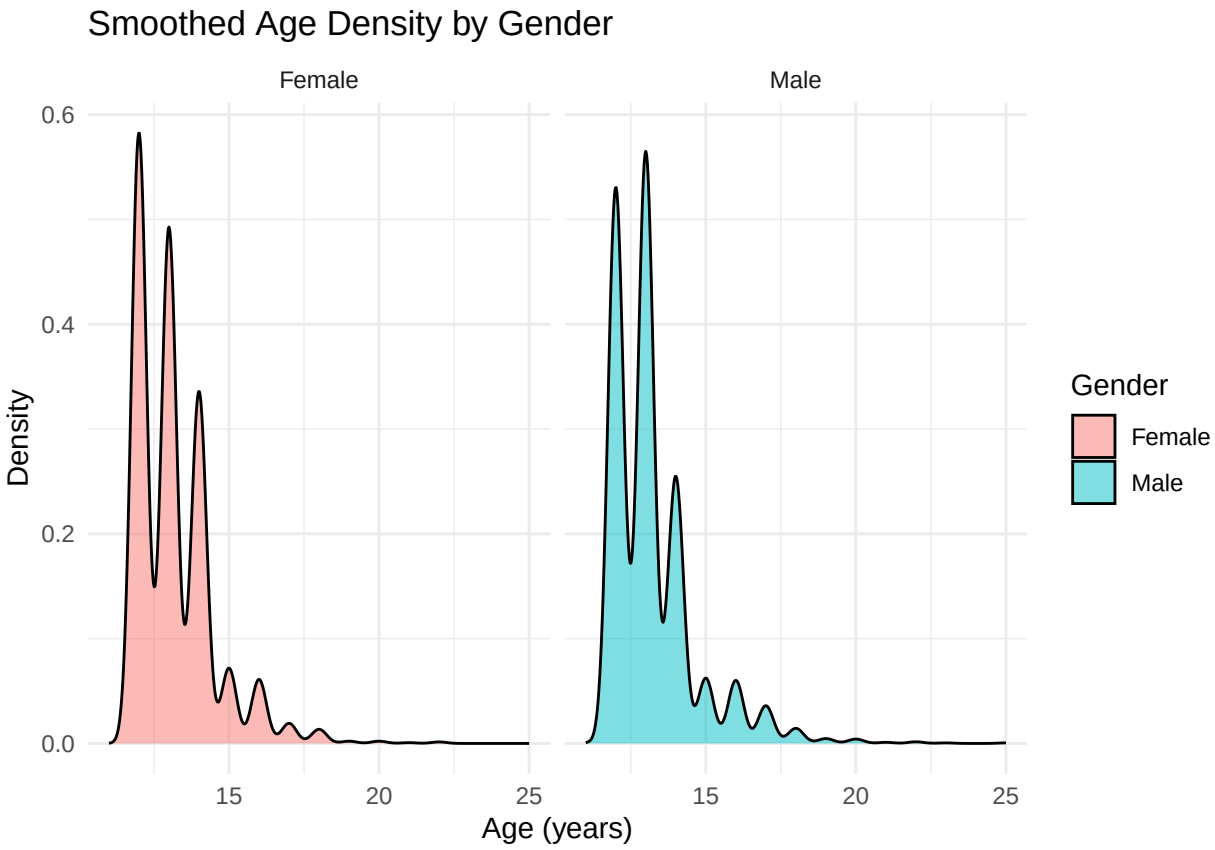

Figure 6: Age Density by Gender

A/B Test — Mean Age of T vs. U

```
##
##  Welch Two Sample t-test
##
## data:  Age by Classification
## t = -8.4633, df = 3762.7, p-value < 2.2e-16
## alternative hypothesis: true difference in means between group T and group U is not equal to 0
## 95 percent confidence interval:
##  -0.3775550 -0.2355285
## sample estimates:
## mean in group T mean in group U
##        12.76534        13.07188

## The t-test comparing mean ages of T (~12.8) vs. U (~13.1) yields p < 0.05, indicating a statistically
```