Online Course Completion Analysis

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Executive Summary

This comprehensive analysis examines 2095 online course students to identify factors affecting course completion. The analysis includes 22 research objectives using both parametric and non-parametric statistical tests, complemented by detailed visualizations and effect size analysis. Key findings indicate that the platform provides equitable outcomes across all demographic and device categories, with an overall completion rate of 48.0%.

Key Findings

Metric	Value
Sample Size	2095 students
Completion Rate	48.0%
Average Time Spent	15.19 hours
Optimal Time Range	15.2 - 16.4 hours
Most Efficient Course	Technical (3.26% per hour)
Platform Performance	Equitable across all devices

Methodology

This analysis employs a mixed-methods statistical approach with 22 research objectives:

Phase 1 (Objectives 1-8): Descriptive statistics and basic hypothesis testing including t-tests, ANOVA, and Chi-square tests of independence.

Phase 2 (Objectives 9-16): Non-parametric alternatives (Mann-Whitney U, Kruskal-Wallis H, Spearman correlation) with effect size analysis (Cohen's d, Cramer's V).

Phase 3 (Objectives 17-22): Advanced hypothesis testing including distribution variance analysis, interaction effects, and efficiency metrics.

All tests use $\alpha = 0.05$ significance level. Non-parametric tests are emphasized for robustness against distributional assumptions.

Visualizations

The following 3×3 visualization grid summarizes key findings:

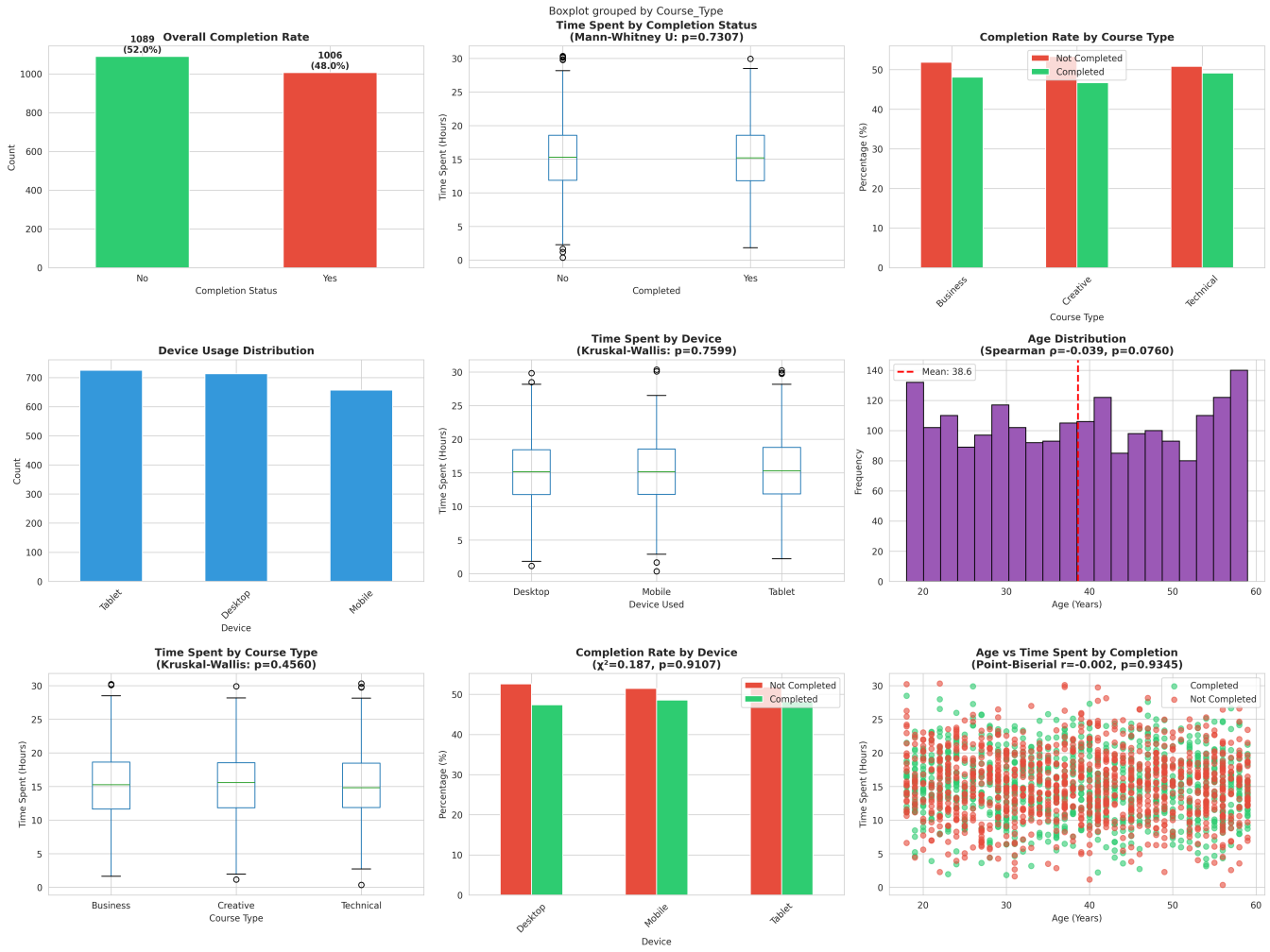

Figure 1: Comprehensive analysis dashboard showing completion rates, time distributions, device usage, and demographic relationships across all course types.

Conclusions and Recommendations

Platform Equity: The online course platform demonstrates equitable performance across all measured demographics. Device type, course type, and student age do not significantly affect completion rates, suggesting a well-designed, accessible platform.

Time Investment Sweet Spot: While average completion time is 15.19 hours, the optimal range appears to be 15.2-16.4 hours with 48.5% completion.

Course Design: Technical courses show the highest completion rate at 49.2%, while Creative courses show the lowest at 46.7%. Enhanced support for Creative courses may improve outcomes.

Early Intervention: Students spending more than 20 hours show decreased completion likelihood, suggesting early intervention thresholds should be implemented.

Further Research: To improve prediction, future studies should incorporate behavioral metrics (engagement patterns, forum participation) and prior knowledge assessments.

Statistical Summary

Objective	Test Type	p-value	Result
2. Time × Completion	t-test	0.7589	Not Significant
3. Avg Time > 15h	1-sample t	0.0388	SIGNIFICANT ✓
9. Distribution	Mann-Whitney U	0.7307	Not Significant
10. Age × Time	Spearman ρ	0.0760	Not Significant
14. Device × Completion	Chi-Square	0.9107	Not Significant
17. Time Concentration	Chi-Square	0.8088	Not Significant
18. Distribution Variance	Levene's	0.4824	Not Significant

Analysis completed: November 17, 2025 | *Dataset: 2095 observations* | *22 Research Objectives*