**Education Analysis: Course Grades and Student Choice**

Surendar N. Reddy

DeVos Graduate School, Northwood University

MTH 650: Introduction to Data Analytics

Dr. Itauma Itauma

March 2nd, 2025

**Abstract**  
  
With the growth in distance learning, course grading has become a crucial measure of student and course preference. This study aims to investigate difficulty levels and certificate types and their effects on student rating. The result shows that straightforward courses are highly rated, in contrast to specialist certifications. Adjustments on design and interaction are suggested to improve course design.  
  
**Introduction**  
  
The application of online learning platforms has generated more focus on course ratings as a measure of quality and student interaction. Better course materials demand understanding how course difficulty and certification category influence ratings. This study aims to explore whether more accessible courses are rated higher and how these differ with alternative certificate types.  
  
**Problem Statement**  
  
Online course sites look to maximize student satisfaction, which is a key factor in deciding enrollment and completion rates. Having knowledge on how course difficulty and certificate types affect student ratings can enable the site to modulate course design such that it would be preferable for students.  
  
**Methodology**  
  
**Dataset Description**  
  
The dataset consists of student ratings of online courses categorized by:  
  
Course Difficulty Levels: Advanced, Beginner, Intermediate, Mixed  
Certificate Types: Course, Professional Certificate, Specialization  
Rating Scale: 1 to 5 (most preferred)  
  
**Data Collection & Preprocessing**  
  
The data were collected from an online course platform, including ratings, difficulty levels, and certificate types. The data was cleaned to ensure accuracy, and missing values were dealt with appropriately.

**Exploratory Data Analysis (EDA)**  
  
Summary statistics were calculated to compare ratings based on difficulty levels and certificate types.  
Visualizations, i.e., histograms and boxplots, were employed to analyze rating distributions.  
Results  
**Course Difficulty vs. Ratings**  
  
Mixed and Beginner courses had the best average ratings (~4.7).  
Intermediate courses received marginally lower ratings (~4.65).  
Advanced courses showed the largest variance, which suggests uneven ratings.  
Interpretation: The finding is that learners like less advanced courses and thus rate beginner content higher.  
  
**Certificate Type vs. Ratings**  
  
Standalone Courses received the highest average rating (~4.71).  
Professional Certificates followed closely (~4.7) but with fewer data points.  
Specializations received the lowest ratings (~4.62).  
Explanation: More general and brief courses are more likely to have higher ratings, perhaps because there is less workload and complexity involved.

**Visual Insights**  
  
Histograms indicate that Mixed and Beginner courses group around the top ratings.  
Boxplots indicate that Course-type certificates have less consistent ratings with some low-scoring outliers.  
Discussion & Recommendations  
As there are more students enrolled in brief courses, more advanced courses must be supported with extra resources so that students are better equipped to succeed.  
Lower scores for Specialization courses reflect the need for improved course design and interaction strategies.  
Advanced courses must include more interactive and facilitative learning strategies to improve student experience.  
Conclusion  
This study identifies that students have a tendency for opting for simpler and shorter courses. Online learning sites can achieve the benefit from such observations by maximizing the course delivery through a balance between access and learning intensity. Later research can further explore demographic tendencies to further specialize in course design strategies.

**References**  
  
Allen, I. E., & Seaman, J. (2017). Digital learning compass: Distance education enrollment report 2017. Babson Survey Research Group. https://www.onlinelearningsurvey.com/reports/digtiallearningcompassenrollment2017.pdf  
  
Kizilcec, R. F., Pérez-Sanagustín, M., & Maldonado, J. J. (2017). Self-regulated learning strategies predict learner behavior and goal attainment in Massive Open Online Courses. Computers & Education, 104, 18-33. https://doi.org/10.1016/j.compedu.2016.10.001  
  
Wang, Y., Huang, L., Schunn, C., & Matsumura, L. C. (2021). Course difficulty and student satisfaction in online learning: An empirical study. Journal of Educational Computing Research, 59(3), 545-562. https://doi.org/10.1177/0735633121997624  
  
Sun, J. C.-Y., & Rueda, R. (2012). Situational interest, computer self-efficacy, and self-regulation: Their impact on student engagement in distance education. Learning and Individual Differences, 22(2), 118-125. https://doi.org/10.1016/j.lindif.2011.08.002  
  
Moore, M. G., & Kearsley, G. (2011). Distance education: A systems view of online learning (3rd ed.). Wadsworth Cengage Learning.