Exploring the Effectiveness of Exploratory Testing: A Case Study in Higher Education

The goal of this research study is to investigate the effectiveness of exploratory testing methodologies in the context of higher education, specifically within software engineering or computer science programs. By conducting this study, we aim to provide insights into the practical applications of exploratory testing and its impact on software quality and student learning outcomes.

Research questions:

1. In what ways does the integration of exploratory testing methodologies impact the caliber of software created by students in higher education environments?
2. What are the recognized advantages and obstacles associated with the integration of exploratory testing practices into the curricula of software engineering or computer science courses?
3. How do students' perceptions of testing and software quality evolve following their participation in exploratory testing initiatives?

The methodology of this study will employ a mixed-methods strategy, blending quantitative scrutiny of software quality indicators with qualitative insights garnered from surveys and interviews. The research will unfold in two stages:

Phase 1: Implementation of Exploratory Testing

- Forge collaborations with select software engineering or computer science courses in higher education institutions to embed exploratory testing methodologies into their syllabi.
- Provide comprehensive training and resources to instructors and students on the intricacies of exploratory testing techniques and best practices.
- Monitor and meticulously document the implementation process, meticulously noting encountered challenges and adaptations made.

Phase 2: Evaluation of Effectiveness

- Gauge the quality of software crafted by students pre- and post-incorporation of exploratory testing methodologies, utilizing metrics such as defect density, code coverage, and stakeholder satisfaction.
- Administer surveys to both students and instructors to glean insights into their encounters with exploratory testing.
- Conduct interviews with a subset of participants to delve deeper into their perceptions and attitudes towards exploratory testing.

Metrics:

Defect Density: Number of defects found per lines of code.

Code Coverage: Percentage of code exercised by test cases.

Customer Satisfaction: Feedback from stakeholders on the usability and reliability of the software.

Student Attitudes: Changes in students' perceptions of testing and software quality through pre- and post-study surveys.

Through this research study, we aim to contribute to the body of knowledge on exploratory testing and its implications for higher education. By examining both quantitative and qualitative data, we seek to provide actionable insights for educators and practitioners looking to enhance the effectiveness of software testing practices in academic and industrial settings.

Title : Levels of Exploration in Exploratory Testing: From Freestyle to Fully Scripted

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