Quantifying Career Preferences and Perceptions of Software Testing Among Filipino IT Students: A Mixed-Method Analysis

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***Abstract*—Software testing (ST) careers have consistently demonstrated low appeal among IT students globally, creating significant workforce gaps in this essential field of information technology. This study investigates the extent to which Filipino IT students share this disinterest in software testing careers as observed in previous international studies, while examining the unique cultural, economic, and curricular realities that influence their career decision-making processes. Utilizing a mixed-methods approach, the research analyzes quantitative survey responses and qualitative focus group discussions to determine student perceptions and attitudes toward the software testing profession. The study employs a multidimensional framework to explore local factors that shape career preferences among Filipino IT students. Findings confirm that software testing is not the first career choice for most respondents, paralleling previous international research findings. However, qualitative data reveal that students demonstrate significantly greater interest when opportunities offer competitive salaries, clear career growth trajectories, meaningful professional development opportunities, and comprehensive academic training in software testing methodologies. The research identifies unique local factors, including economic pressures, cultural perceptions of professional prestige, and significant curriculum gaps that systematically influence students' career decisions. These results highlight critical needs for effective reforms within current IT curricula and enhanced career guidance programs to address the systematic undervaluation of the software testing profession. The study's implications suggest that targeted educational interventions and improved industry-academia collaboration could better prepare students for the fast-evolving demands of the IT industry while addressing the persistent shortage of qualified software testing professionals in both local and global markets.**

***Keywords*—Software testing; career preferences; Filipino IT students; mixed methods; education reform**

I. Introduction

The global demand for software testing professionals continues to grow amid increasing digital transformation and technological complexity. The Philippines has established itself as a significant player in the global IT-Business Process Outsourcing sector, producing thousands of IT professionals annually [5]. However, a concerning trend has emerged: students worldwide, including those in the Philippines, consistently demonstrate a declining interest in pursuing testing careers. This divide between industry needs and student preferences poses significant implications for economic competitiveness. The shortage of skilled testers compromises the country's ability to meet international quality standards and maintain competitiveness in the global market [14]. Understanding this gap requires examining the unique Filipino context, where cultural values around recognition and achievement, socio-economic factors influencing career decision-making, and an educational system that inadequately represents software testing opportunities converge to shape IT students' career perceptions and priorities.

This study addresses the gap in Filipino IT students' career preferences by establishing specific objectives that target both the identification and understanding of barriers within the Philippine cultural, educational, and economic context. The research seeks to explore how specific local cultural values, such as collectivism and familial obligation, economic considerations within the Philippine job market, and curricular structures in Philippine educational institutions contribute to declining interest in software testing careers. By examining these factors, this research aims to provide a comprehensive understanding of influences on IT students' career decision-making processes, ultimately informing educational reforms and policy interventions that can bridge the gap between industry demand and student interest.

This study seeks to answer several research questions. First, to what extent do Filipino IT students demonstrate reluctance toward software testing careers compared to international trends, specifically examining alignment with patterns observed in Brazil, Norway, Pakistan, Canada, India, and China? Second, how do cultural, economic, and educational factors uniquely combine to shape Filipino students' interest in software testing

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careers within the distinctive Philippine context? Third, what are Filipino IT students' perspectives regarding the advantages and disadvantages associated with software testing careers? Finally, what culturally appropriate strategies can be implemented to enhance the appeal of software testing careers for Filipino IT students?

Given the complexity of cultural, educational, and economic factors influencing Filipino IT students' career preferences, this study employs a mixed methods research (MMR) approach to provide a comprehensive understanding of the phenomenon [11]. The quantitative component enables systematic comparison of Filipino students' attitudes toward software testing careers with international trends, providing measurable data on preference patterns and demographic influences. The qualitative component captures nuanced cultural values, personal experiences, and contextual factors that statistical data alone cannot fully explain. This MMR design ensures both breadth (through quantitative analysis) and depth of understanding (through qualitative insights), particularly important when examining culturally embedded career decision-making processes that require both empirical validation and rich contextual interpretation.

This study employs a systematic approach to examine the complex dynamics of career preferences in software testing, guided by research questions that examine perceptual and motivational factors within the Philippine context. The primary research focus examines the extent to which Filipino IT students demonstrate reluctance toward software testing careers compared to other countries, placing the Philippine experience within a broader global framework of student career preferences. The unique intersection of cultural, economic, and educational factors shaping Filipino students' interest in software testing examines how deeply embedded Filipino cultural values, such as collectivism, close family ties, and *utang na loob* (debt of gratitude), influence career decision-making processes. This analysis simultaneously examines how coding-focused structures in Philippine IT education programs shape perceptions of and knowledge of software testing as a viable career path. Understanding Filipino IT students' perspectives on software testing careers investigates how they conceptualize the advantages and disadvantages associated with testing roles. Finally, exploring culturally appropriate strategies to enhance software testing career appeal ensures proposed interventions align with Filipino cultural values, educational structures, and economic realities while addressing identified gaps in student interest.

The following section reviews existing literature on global trends in software testing careers, cultural influences on career choices, and curriculum-industry alignment to contextualize this study within the broader academic discourse.

II. Literature Review

A. Global Trends in Software Testing Careers

The decline in student interest in software testing careers is a well-documented global phenomenon. In [20], the authors conducted foundational research in Norway, revealing that students consider software testing less intellectually stimulating than software development roles. Their study found that limited coverage of testing in programming courses and a lack of specialization [4] actively discourage students from pursuing testing careers.

Building on this perspective, [7] and [8] examined similar trends in Pakistan, confirming that students view software testing as less appealing due to its perceived lack of challenge and learning opportunities. Capretz's study highlighted psychological factors contributing to this disinterest, particularly the influence of social perceptions and status considerations on career decision-making.

In [20], the authors documented similar findings in Brazil, where students consistently underestimate the profession's value due to minimal practical exposure and outdated curriculum materials. Their research emphasized the importance of hands-on training and integration of modern tools in shaping positive career perceptions.

In [15], the authors contributed to understanding the gap between industry and academia by highlighting the growing importance of Continuous Integration and Continuous Deployment (CI/CD) practices. Their study revealed significant misalignments between educational content and professional requirements.

Additional studies from India, Japan, and Finland confirmed these global trends while identifying successful interventions, particularly regarding test automation education and industry collaboration models. The consistency of findings across diverse educational systems and cultural contexts [21] [22] suggests that barriers to interest in software testing careers extend beyond national boundaries, reflecting deeper systemic issues within global IT education that position software testing as secondary to software development roles.

B. Cultural and Educational Factors in Career Choices

While global studies have identified common career preference patterns, research examining cultural influences on IT career choices remains limited. Studies focusing on collectivist cultural contexts show that deeply rooted cultural values significantly influence career choices. Family expectations, economic pressures, and the need for social harmony play crucial roles in career selection.

Research on Filipino culture highlights concepts such as *hiya* (shame/embarrassment), *pakikisama* (harmony), and *utang na loob* (debt of gratitude) [16], which create specific dynamics influencing professional choices. These cultural norms are particularly relevant to software testing roles, where maintaining workplace harmony may lead to anxiety about critiquing colleagues' work.

Studies on economic considerations reveal that students from working-class families often base career choices on financial capacity [17], [19] and potential for overseas employment. Cultural obligations may intensify pressure to pursue higher-paying development roles rather than testing careers, creating barriers not as pronounced in Western contexts.

These cultural factors have significant implications for the Philippine IT industry, especially given its status as a global outsourcing hub. There is a need to reframe software testing as

a collaborative and essential part of the development process rather than as a conflict-focused role.

C. Curriculum Analysis and Industry Alignment Studies

Based on the comparative analysis of international studies, significant curriculum gaps in software testing education exist across multiple countries, with the Philippines exhibiting similar deficiencies to other nations.

As indicated in Table I, Pakistan, Norway, and Brazil do not include dedicated software testing courses in their IT curricula, a trend that is reflected in the Philippine educational system. The situation in the Philippines closely mirrors these international observations, as institutions such as De La Salle University prioritize programming and mobile development without offering a specific emphasis on testing. Meanwhile, Batangas State University's software testing elements are often overshadowed by its general software design courses.

TABLE I. CURRICULA COMPARISON BETWEEN COUNTRIES

Study	Country/Region	Curriculum Emphasis on Software Testing	Proposed Curriculum Reforms	Impact on Students' Perception and Barriers
Capretz (2020)	Pakistan	✗ (No dedicated testing subject).	• Introduce software testing principles and standards.	Testing is not seen as a viable career.[1]
Deak et al. (2013)	Norway	✗ (No dedicated testing subject).	• In-depth lectures. • Increase industry collaboration.	Testing is undervalued.[2]
Souza et al. (2022)	Brazil	✗ (No dedicated testing subject).	• Increase hands-on training. • Introduce modern tools.	Limited focus and interest for students.[3]

[1] No dedicated testing courses lead to low student interest and career consideration, a pattern also seen in the Philippines.

[2] Brief coverage in curricula and a lack of specialization discourage students from pursuing testing.

[3] Minimal practical exposure and outdated curriculum cause students to underestimate the profession's value.

To address these gaps, Table II illustrates the potential solutions:

However, Table III projects the expected impact.

The proposed reforms for the Philippine IT curriculum, developed per CHED guidelines shown in Table II, systematically address identified gaps by integrating real-world testing scenarios, establishing software quality assurance laboratories, implementing CI/CD pipelines, and introducing specialized testing modules in AI, cybersecurity, and IoT domains. The anticipated outcomes, as detailed in Table III, suggest significant improvements across various metrics: a 10% increase in course enrollment, a 15% enhancement in graduate employability, and a 25% growth in internship placements. These projections highlight the substantial potential impact of addressing systematic deficiencies within the curriculum.

TABLE II. ALIGNMENT OF CHED CURRICULUM GUIDELINES WITH PROPOSED REFORMS

CHED Reference [10]	Current Curriculum Focus	Proposed Reform
8.1: General Description	• Program design, debugging, and implementation.	• Real-world testing scenarios.
8.2: Specific Description	• OOP • Software engineering principles.	• Include SQA labs, tools, and CI/CD pipelines.
8.2: Specialized Areas	• AI/ML. • Cybersecurity. • Data Science. • IoT.	• Testing modules for each domain.
8.3: Internship/Practicum	• Classroom knowledge to real-life application.	• Align with industry standards. • Provide career guidance.

TABLE III. ANTICIPATED OUTCOMES OF THE PROPOSED REFORMS

Reform Reference	Summary of Reform	Expected Outcome
8.1	Real-world testing practices and CI/CD integration.	+10% course enrolment in 3 years.
8.2	Lab-based SQA instruction and test automation exposure.	+15% graduate employability via industry-ready skills.
8.2	Specialized training in AI, cybersecurity.	+20% placement in specialized training roles within 2 years.
8.3	Stronger internships and industry ties.	+25% internship placements over 3 years.

Incorporating industry-standard tools such as Selenium and CI/CD practices into Philippine curricula serves two primary objectives: aligning with global industry standards and meeting the needs of local technological startups [13] for cost-effective yet efficient testing solutions. These curriculum reforms represent a critical advancement in elevating both the academic and professional recognition of software testing, while also preparing students to meet the evolving demands of the Philippine IT sector.

The educational landscape in the Philippines reflects a broader international trend regarding deficiencies in software testing curricula. Institutions like De La Salle University emphasize programming and mobile development while often neglecting dedicated testing components, while Batangas State University relegates its software testing curriculum to subordinate roles within general software design courses. This situation exemplifies a global disconnect, as illustrated in Table IV, which reveals prevalent software testing gaps across countries such as India, Pakistan, Brazil, Norway, and the Philippines, despite the industry's growing demand for these competencies.

Analysis of curriculum-industry misalignment uncovers significant disparities in educational coverage. While countries like Japan and Finland integrate test automation instruction, the Philippines lacks comprehensive education on essential tools such as Selenium, and CI/CD practices identified by [15] as emerging industry standards exhibit medium-level coverage

gaps. The comparative analysis highlights agile development, software testing, and test automation as highest-priority gaps requiring immediate attention through mandatory modules and standalone courses with hands-on training.

TABLE IV. CURRICULUM-INDUSTRY MISALIGNMENT

Curriculum Topic	Taught in (Country)	Required by Industry	Gap Level (High/Medium /Low)	Recommendation
Agile Development	Philippines, India	Yes (Global)	High	Mandatory module in the senior year.
Software Testing	India, Pakistan, Brazil, Norway, Philippines	Yes (Global)	High	Standalone courses with hands-on training.
CI/CD	Finland	Yes (Global)	Medium	Practical modules on CI/CD.
Test Automation	Japan, Finland	Yes (Global)	High	Cover tools like Selenium.
Security Testing	Australia	Yes (Global)	Medium	Specialized training in Cybersecurity.
Software Quality Assurance	Japan	Yes (Global)	Medium	Embed in software engineering subjects.

The systematic nature of these deficiencies points to curriculum inadequacies transcending national borders, representing a global challenge necessitating coordinated reform efforts. International evidence indicates that software testing curriculum gaps create structural barriers to career development, highlighting the urgent need for comprehensive educational realignment with industry requirements. These findings advocate for immediate curriculum reform through dedicated courses, hands-on training, and stronger industry partnerships to elevate software testing from an undervalued discipline to a recognized career pathway. Countries failing to address these gaps will continue producing graduates inadequately prepared for contemporary software development practices.

Philippine Context and Research Gap: Despite global declining interest in software testing careers, the Philippine context presents unique characteristics requiring specialized investigation. As a major IT outsourcing hub, the Philippines faces distinct challenges in software testing education and career development. Analysis of Philippine IT curricula reveals patterns consistent with international findings: major institutions primarily emphasize programming and development while offering limited comprehensive testing education, with CHED curriculum guidelines showing significant gaps in testing-focused content across all program levels.

Four critical gaps justify this study: First, while previous research by [7], [12], and [20] examined cultural, economic, and curricular factors, these studies analyzed them in isolation rather than exploring their interconnected influences on career preferences, leaving us without a holistic understanding of how these factors interact. Second, international studies inadequately address how Filipino collectivist values shape career attitudes toward software testing, with the unique dynamics of Filipino cultural decision-making in IT career contexts remaining unexplored. Third, despite the Philippines' prominent role in global IT outsourcing, no comprehensive studies examine Filipino IT students' career motivations within their unique cultural, economic, and educational contexts—a significant oversight given the country's strategic importance in the global IT industry. Finally, existing literature has not investigated how local cultural constructs, family dynamics, social prestige concerns, and economic necessities collectively impact students' reluctance to pursue software testing careers, making understanding this complex interplay essential for developing effective educational interventions.

This research addresses these gaps through comprehensive factor analysis examining how cultural, economic, and curricular factors interact to influence software testing career preferences in the Philippine context. The study incorporates insights from key international research while developing culturally sensitive approaches for Filipino participants, offering valuable insights for educational institutions, industry stakeholders, and policymakers working to enhance the Philippine IT sector's testing capabilities.

III. METHODOLOGY

This section outlines the comprehensive research methodology employed to investigate Filipino IT students' perceptions and career preferences toward software testing (see Fig. 1). The methodology encompasses the convergent parallel mixed-methods research design that integrates quantitative and qualitative approaches, participant selection criteria and sampling strategies, instrumentation development and validation procedures, data collection protocols across multiple Philippine regions, analytical techniques for both statistical and thematic analysis, and the synthesis strategy for integrating findings from both methodological streams to provide a holistic understanding of the factors shaping software testing career decisions among Filipino IT students.

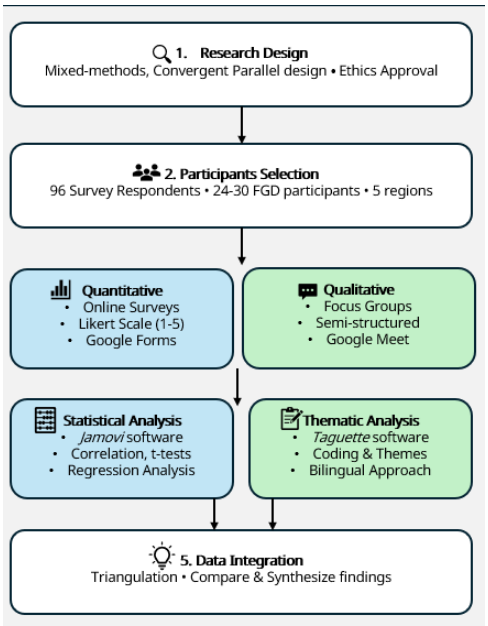

Fig. 1. Framework of the research methodology of the study quantifying career preferences and perceptions of software testing among Filipino IT students: A mixed-method analysis.

A. Research Design

This study employed a convergent parallel mixed-methods research design to comprehensively examine IT students' perceptions and attitudes toward software testing careers in the Philippines. The methodology integrated both quantitative and qualitative approaches to provide a holistic understanding of cultural, educational, and socioeconomic factors influencing career decisions in software testing. A systematic narrative review was conducted following established guidelines to contextualize the research within existing international literature. The review examined studies published between 2013 and 2024, focusing on software testing career perceptions, cultural influences on IT career choices, and educational factors affecting professional preferences in technology fields.

This study adhered to ethical standards outlined by the Education Centre of Australia and was approved by the Institute's ethics board. Before data collection, participants were informed about the purpose of the research, the voluntary nature of participation, and the confidentiality of their responses. Written informed consent was obtained from all participants, ensuring that they understood their rights and the study's procedures.

B. Participants

Participants were selected based on specific inclusion and exclusion criteria to ensure the relevance and reliability of findings. The inclusion criteria required participants to be currently enrolled undergraduate students in Philippine universities, preferably third or fourth-year students (with selective inclusion of first and second-year students meeting other criteria), majoring in Computer Science, Information Technology, or Computer Engineering, and fluent in English or Filipino. Exclusion criteria eliminated students enrolled in non-IT related programs, individuals with professional software testing experience, students unable to complete surveys in English or Filipino, and first or second-year students not meeting additional inclusion criteria. A multi-stage sampling approach was implemented, utilizing random sampling as the initial sampling strategy and stratified sampling for the quantitative phase to ensure representativeness across university types (public/private), academic levels, and geographical regions, while purposive sampling was employed for focus group discussions to capture diverse perspectives and experiences. The target sample size is a minimum of 384 students for surveys and was deduced to 98 after data cleaning, and 24-30 students distributed across 4-5 focus groups with 6 participants per group. Participants were recruited from five regions across the Philippines, representing both urban and rural contexts, with two universities (one public, one private) selected from provinces identified in the 2022 Philippine Statistics Office's [18] top urban and rural cities list.

C. Instrumentation

The research instruments comprised a structured questionnaire and focus group discussion guide, both designed to capture comprehensive data on students' perceptions of software testing careers. The survey instrument incorporated both closed-ended and open-ended questions to measure interest levels in software testing careers using a 5-point Likert scale, while exploring cultural perceptions and values influencing career decisions, economic considerations and job market awareness, educational experiences and curriculum exposure, and social and familial influences. The dependent variable focused on interest in pursuing software testing careers, while independent variables included cultural perceptions, career awareness, economic factors, educational influence, and social/familial influence, with control variables encompassing age, gender, year level, degree program, and institution type. Semi-structured focus group discussion guides were developed to explore cultural influences on career choices (*utang na loob, bayanihan, pakikisama*), family expectations and social pressures, perceptions of software testing prestige and career prospects, educational experiences and curriculum adequacy, and suggestions for improving software testing career appeal. A pilot study involving 20 participants was conducted to refine instrument clarity, reliability, and effectiveness, resulting in key improvements including standardization of Likert scale response options (1=lowest, 5=highest), revision of binary yes/no questions to more engaging formats, and enhanced question sequencing and wording clarity.

D. Data Collection

Data collection employed a dual-phase approach utilizing both online surveys and focus group discussions to ensure comprehensive data gathering from geographically dispersed participants. Online surveys were administered using Google Forms to ensure accessibility, anonymity, and convenience for participants across multiple regions. Participants were contacted through department heads and student organizations, with weekly follow-ups implemented to maintain adequate response rates and ensure representative participation from diverse institutional contexts. Focus group discussions were conducted online via Google Meet, with sessions recorded for subsequent analysis, while trained facilitators moderated discussions to ensure balanced participation and maintain research focus on key themes. Given the Philippines' bilingual context, participants were encouraged to express themselves in either Filipino or English based on their comfort level to facilitate authentic and nuanced responses. Multilingual responses were systematically handled through verbatim transcription of all focus group discussions, translation by trained bilingual research assistants maintaining cultural sensitivity, retention of original Filipino expressions alongside translations to preserve contextual meaning, and verification of translation accuracy through comprehensive audio review to ensure analytical integrity.

E. Data Analysis

Data analysis employed a comprehensive mixed-methods approach utilizing both quantitative statistical techniques and qualitative thematic analysis to examine students' perceptions of software testing careers. Statistical analysis was conducted using *jamovi* software, employing descriptive statistics including frequencies, percentages, means, and standard deviations to characterize participant responses and demographics. Inferential statistics included correlation analysis to examine relationships between software testing interest and influencing factors such as curriculum exposure, peer influence, and cultural elements, t-tests to compare group differences between male versus female students and public versus private institutions, and regression analysis to identify predictors of

software testing career interest. All statistical tests were conducted at 95% confidence level with significance threshold of $\alpha = 0.05$ to ensure statistical rigor. Qualitative data analysis employed systematic thematic analysis using *Taguette* software, beginning with verbatim transcription of all focus group discussions while maintaining bilingual considerations. The coding process involved multiple coders with established intercoder reliability exceeding 70% agreement and Cohen's kappa greater than 0.61, a clear coding framework defined prior to analysis, regular coder training and discussion sessions, and comprehensive documentation of disagreements and resolution processes. Thematic analysis followed a systematic six-step process, including data familiarization through repeated reading and audio review, initial code generation capturing significant data features, theme identification by grouping codes into broader categories, theme review and refinement for accuracy, final theme definition and naming, and report production with supporting quotations to illustrate key findings.

F. Synthesis Strategy

The data integration and triangulation process employed a convergent parallel design that facilitated systematic integration of quantitative and qualitative findings through multiple analytical approaches. Triangulation was utilized to identify convergent and divergent themes across methodological approaches, while sequential explanation used survey data to guide focus group discussion exploration of key findings. Joint displays systematically compared quantitative results with qualitative insights to reveal complementary and contradictory patterns, and methodological validation was achieved through cross-method comparison to enhance overall research credibility. The data synthesis employed convergence, expansion, and divergence approaches to maximize analytical depth, with convergence comparing measured interest levels with participants' lived experiences, expansion using qualitative data to elaborate on quantitative findings and provide contextual understanding, and divergence exploring contradictions between methods to enhance a comprehensive understanding of complex phenomena. The integration process followed established mixed-methods protocols to ensure comprehensive analysis that addressed research questions from multiple methodological perspectives while maintaining rigor and validity throughout the investigation, ultimately providing a holistic understanding of factors influencing Filipino IT students' perceptions of software testing careers.

IV. Results

This section presents the comprehensive findings from both quantitative and qualitative data collection phases that examined Filipino IT students' perceptions and career preferences toward software testing. The results are organized into quantitative survey findings that reveal statistical patterns in career preferences, perceived advantages and disadvantages of testing software roles, and the influence of cultural, economic, and curricular factors on career decisions, followed by qualitative insights from focus group discussions that provide deeper contextual understanding of students' perspectives and experiences. The findings are further synthesized through convergence and divergence analysis that integrates both methodological approaches to illuminate how cultural values such as *utang na loob, pakikisama*, and *bayanihan* intersect with economic considerations and educational exposure to shape career decision-making processes among Filipino IT students, ultimately revealing both similarities with and distinctions from global trends in software testing career perceptions.

A. Quantitative Results

These results present the findings from the survey, including how Filipino students' perceptions of software testing were compared with global trends. Tables and charts are used to illustrate key data points such as the perceived prestige, financial rewards, and job availability of software testing careers.

Table V and Table VI are closely related to the framework's Cultural dimension, which indicates that students prefer SD over ST due to perceived career prestige. The quantitative survey analysis reveals that Filipino IT students demonstrate clear preferences for software development over software testing careers, with testing consistently ranking lower in career preference rankings, mirroring international trends documented in previous studies. These ranking patterns reflect deeply ingrained cultural perceptions that position development roles as more prestigious [2] and innovative compared to testing positions, which are often viewed as secondary or support functions within the software development lifecycle.

TABLE V. Descriptive Statistics for IT Roles Ranking

Measure/Position	Development	Testing	Network Admin	Database Management	Cyber-security	Interpretation
Mean Rank (Preference)	2.47	3.34	2.86	3.23	3.6	Lower preference than most other IT fields; close to lower-preferred roles
Median Rank	2	3	3	3	3	Middle value, indicating moderate popularity
Mode Rank	1	3	3	3	1	Most frequent rank is moderate (3); not top choice
25th-75th Percentile	2.00-4.00	3.00-4.00	2.00-4.00	2.00-4.00	2.00-4.00	Most responses are at mid-to-lower preference
Skewness	0.519	-0.114	0.0896	-0.0686	-0.411	Near zero, distribution is symmetric, no strong aversion or preference

TABLE VI. DESCRIPTIVE STATISTICS FOR LIKELIHOOD TO PURSUE A CAREER IN ST

Likelihood to Pursue	Software Testing	Interpretation
Mean	3.66	Slightly above neutral, suggesting tepid interest
Median	4	Middle response is moderately positive
Mode	3	Most common score is neutral/mildly positive
25th–75th Percentile	3.00–4.00	Most responses clustered near neutral
Skewness	-0.313	Slight negative skew; a few strongly positive

Survey data in Table VI exploring the likelihood of Filipino students pursuing careers in software testing reveals a limited interest, mirroring global research trends that highlight a general reluctance toward testing roles across various cultural contexts. The statistical distributions shown in Table VII indicate that cultural factors play a significant role in shaping career decision-making processes, leading students to favor positions perceived as having higher status, better compensation opportunities, and greater technical challenges. This pattern of preferences illustrates how cultural values concerning professional hierarchy and technical expertise influence student career aspirations, ultimately impacting the availability of qualified testing professionals within the Filipino IT industry.

The Cultural dimension analysis shown in Table VIII reveals that among all tested factors, only *utang na loob* emerged as statistically significant in predicting career pursuit likelihood, contrasting with international studies and highlighting unique Filipino cultural influences on career decisions. This finding demonstrates the powerful role of reciprocal obligations in Filipino career choices, where students may consider software testing to honor family investments in their education or repay mentors who guided their academic journey. The statistical significance of *utang na loob* suggests that Filipino career decisions are deeply embedded in relational contexts rather than purely individual preferences.

Economic pillar analysis through t-test comparison shows that public university students demonstrate a higher likelihood to pursue software testing careers compared to private university students, contrary to Canadian findings [1], where rural students with limited resources showed less interest in technology careers. This reversal indicates that Filipino students from more economically constrained backgrounds may view software testing as an accessible entry point into the IT industry, potentially due to perceived lower barriers to entry or greater emphasis on stable employment opportunities over prestigious career positioning.

Table IX illustrates how cultural perceptions of career prestige discourage students from pursuing software testing roles while highlighting the disadvantages associated with such positions. The descriptive statistics reveal that students demonstrate strong awareness of software testing's perceived limitations, including concerns about career advancement opportunities, technical complexity, and professional recognition within the IT industry. These findings suggest that negative perceptions outweigh positive aspects, reinforcing cultural biases that position testing as less desirable compared to development roles.

TABLE VII. DESCRIPTIVE STATISTICS OF FRAMEWORK COMPONENTS' INFLUENCE

Factor Category	Specific Factor	Mean Likert Score (SD)	Interpretation
Cultural	Family Expectations	3.5 (±0.8)	Moderately influential
Cultural	Peer Perceptions	2.9 (±0.9)	Slightly to moderately influential
Economic	Salary Expectations	4.2 (±0.7)	Highly influential
Economic	Job Stability	4.0 (±0.6)	Highly influential
Curriculum	Coverage in Program	3.1 (±0.8)	Moderately influential
Curriculum	Faculty Attitudes	2.7 (±0.9)	Slightly influential

TABLE VIII. DESCRIPTIVE STATISTICS FOR IMPORTANCE OF SOCIAL HARMONY (PAKIKISAMA AND BAYANIHAN) AND UTANG NA LOOB IN CAREER DECISIONS

Variable	Mean (M)	Median	Mode	Skewness	Interpretation
Colleagues' relationship	4.21	5	5	-1.28	Respondents show very strong agreement, suggesting colleagueship is highly valued and perceived uniformly.
Bayanihan and *pakikisama*	4.46	5	5	-0.67	These collectivist values are broadly affirmed; responses cluster at the 'strongly agree' end, indicating consensus.
Utang na loob	2.9	3	2	0.32	Attitudes are more moderate here, with greater variability; the value's role may be more context dependent.

Note. M = Mean. Negative skewness values indicate clustering toward higher agreement.

TABLE IX. DESCRIPTIVE STATISTICS FOR AGREEMENT ON ST PROS/CONS

Statement Category	Perceived as Advantage	Perceived as Disadvantage	Statistical Evidence (Mean, Skewness)	Interpretation
Requires Expertise	Yes	No	Mean = 4.14, Skew = -1.16	Recognized as requiring high competence; most respondents strongly agree; viewed positively.
Social Skills	Neutral	Neutral	Mean = 3.47, Skew = -0.40	Seen as neither strong advantage nor disadvantage; less important in ST careers.
Learning Opportunities	Yes	No	Mean = 4.10, Skew = -1.35	Strong agreement that ST careers offer learning and growth; major perceived advantage.
Tedious Work	No	Yes	Mean = 4.01, Skew = -0.99	Strong perception of tedium; recognized as an international and local disadvantage.
Critics by Developers	No	Yes	Mean = 3.88, Skew = -0.83	Moderate agreement: criticism from peers is a noted disadvantage, more prominent locally.

The Curriculum pillar findings confirm significant limitations in software testing exposure within university programs, with students reporting minimal curriculum coverage and low self-assessed preparedness for testing careers, corroborating [3], [6], and [7] findings about insufficient testing education. The statistical data in Table VII indicate that educational institutions inadequately prepare students for testing careers through limited course offerings, superficial coverage of testing methodologies, and insufficient hands-on experience with industry-standard testing tools and practices. This curriculum gap perpetuates the cycle of low interest by failing to demonstrate software testing's intellectual rigor, career potential, and critical importance in software quality assurance processes

The regression analysis shown in Table X reveals a strong explanatory power, with an R-value of 0.710 and an explanation of 50.5% of the variance. Notably, only *utang na loob* and the university curriculum, both nearly significant, emerged as statistically significant predictors of the likelihood of pursuing a career.

TABLE X. REGRESSION TEST RESULT OF LIKELIHOOD TO PURSUE VS. INFLUENCING COMPONENTS

Framework Component	F-value	p-value	Interpretation	Significance
Personal interest	0.29	0.883	No meaningful effect	Not significant
Salary expectations	1.191	0.323	No meaningful effect	Not significant
Job market demand	0.567	0.639	No meaningful effect	Not significant
Utang na loob	2.621	0.042	Statistically meaningful effect	Significant
Peer influence	1.984	0.107	No meaningful effect	Not significant
University curriculum	2.413	0.057	Marginal effect	Not significant
Overseas employment	1.686	0.163	No meaningful effect	Not significant

The perceived disadvantages of software testing careers among Filipino students align with international findings, also evidenced in Table IX, reflecting concerns about monotony, limited creativity, insufficient professional recognition, and lower prestige compared to development roles. The framework's Cultural dimension is validated through findings indicating that Filipino collectivist values, such as *pakikisama* and *bayanihan*, moderately influence career decisions, offering a local context that differentiates these results from Western career choice models.

In contrast to the studies of Chinese students [9] and [23], which highlighted a strong influence of parental obligation, Filipino students placed a greater emphasis on personal interests while still being notably affected by cultural debt obligations. These findings demonstrate that although Filipino students share common hesitations about testing careers with their international peers, unique cultural factors such as *utang na loob* and distinct economic motivations create different patterns in their career decision-making processes.

B. Qualitative Insights

This section discusses the insights from focus group discussions, highlighting how cultural factors like *utang na loob* and *pakikisama* influence students' decisions. This integrates narratives from students that explain why software testing is less appealing in the local context.

The theme of cultural values, particularly *pakikisama* (harmonious relationships) and *bayanihan* (communal unity), emerged as moderately influential in shaping workplace satisfaction and interpersonal dynamics rather than direct career choice, as discussed in Table XI. Approximately 60% of participants acknowledged these values' importance in professional settings. One participant emphasized the necessity of *pakikisama* in conflict resolution: "You'd still need *pakikisama*, because there are times you could clash. Like, when I want to report the issue, but the developer might prefer to let it slide…But as a tester, it's your responsibility…so I think *pakikisama* is important for both the tester and developer" (JG). Another participant highlighted bayanihan's role in collaborative work environments: "*…it applies po dito kagaya po sa previous na nabanggit hindi ka naman po talaga magsosolo sa corporate dadating yung point na makikipagcollab ka rin magkakaron kayo ng issues arguments pero itatake mo yon as a constructive*

criticism…" (ADD). However, this cultural influence was not universally prioritized, as evidenced by participants who viewed personal goals as paramount over cultural expectations.

A significant counter-theme emerged where approximately 40% of participants prioritized individual autonomy and personal goals over traditional cultural obligations, particularly regarding *utang na loob*. This perspective challenges conventional assumptions about Filipino cultural influence on career decisions. One participant clearly articulated this stance: "…it's not my priority when it comes to choosing a career given the fact that their satisfaction or other people's satisfaction towards my success, wouldn't feed me or wouldn't pay my bills so what matters the most is my own sanity and me being able to commit and to achieve the things that I want to achieve in the future…" (P1). Another participant reinforced this theme of personal choice over family pressure: "*Para po sakin hindi ako pinipilit ng magulang na piliin yung gusto nila ang choice ko po na mag IT so I think nakadepende na po yun sa tao yung sa utang na loob, I think as a Filipino hindi po mawawala sa atin yung pagiging family oriented parang kusang bigay po satin kahit hindi sabihin…"* (KH). This theme suggests a generational shift where cultural obligations remain acknowledged but are no longer primary drivers of career decisions.

Table XII reiterates that economic considerations play a predominant role in career decision-making, with students prioritizing financial stability over traditional cultural expectations. As one participant candidly noted, "…since we are in a third-world country, who would choose a career that does not meet their needs? That's why many are seeking careers that offer higher pay". Limited exposure in the curriculum poses significant barriers to interest in software testing, with students expressing frustration regarding their inadequate preparation: "I have an interest, but I am held back by the lack of exposure I have. Because we did not study it, I don't have the knowledge of how it works. So, I feel limited in that sense".

TABLE XI. EMERGENT CULTURAL THEMES

Key Theme	Number of highlights	Notes	Data source	Framework Component
ST is a high-pressure job.	61	Most frequently cited disadvantage.	Survey	Career Prestige Perception
ST is seen as tedious.	37	Work is seen as repetitive or monotonous.	Survey	Career Prestige Perception
There are limited opportunities.	30	Concerns about career advancement.	Survey	Career Prestige Perception
ST receives limited recognition.	30	Seen as undervalued compared to developers.	Survey	Career Prestige Perception
ST is seen being prone to workplace conflict.	27	Notable issues with interpersonal dynamics.	Survey	Collectivist Cultural Value
Less Creativity; Need for technical skills.	8	Views as less innovative; requires technical skills.	Survey	Career Prestige Perception
Belief of ST negatively impacting workplace relationships.	39	The majority feel ST does not affect workplace dynamics.	Survey	Collectivist Cultural Value
ST impact workplace dynamics due to the nature of the role.	12	Stress and role-specific challenges.	Survey	Collectivist Cultural Value
Bayanihan affects career choices as teamwork is important.	25	Teamwork is important in choosing a workplace.	Survey	Collectivist Cultural Value
Preference for coding.	13	Simply stated "coding" or expressed passion for coding.	Survey	Career Prestige Perception
ST is seen as fun, interesting, has lighter workload, and easier than development.	-	Perceived pros of ST.	FGD	Career Prestige Perception
ST is seen as inferior to coding, repetitive, and has high learning curve.	-	Perceived cons of ST.	FGD	Career Prestige Perception
Pakikisama helps resolve issues easily between the tester and the developer.	-	Unique cultural value integrated in ST and SD dynamics.	FGD	Collectivist Cultural Value
Collaboration and teamwork are rooted in *bayanihan.*	-	Importance of local value in a workplace.	FGD	Collectivist Cultural Value
Utang na loob is there, but not a priority; personal interest is important.	-	Shift in traditional mindset.	FGD	Collectivist Cultural Value
Personal interest matters more than friends' opinions.	-	Personal interest as top motivator.	FGD	Collectivist Cultural Value
Work-life balance and environment matters.	-	Workplace dynamics is an important factor.	FGD	Collectivist Cultural Value

TABLE XII. EMERGENT ECONOMIC THEMES

Key Theme	Number of highlights	Notes	Data source	Framework Component
There is slow career progression in the role.	14	Perceived disadvantage.	Survey	Job Stability Expectations
ST is seen to provide less salary.	2	Concern on taking ST as a career.	Survey	Financial Necessity
ST provides limited career growth adding up to hesitation.	5	Concerns about long-term career growth and advancement prospects.	Survey	Job Stability Expectations
Salary, job-demand, and opportunities for growth are top priorities.	-	Top factors in choosing a career.	FGD	Financial Necessity
Gaining experience and building a strong portfolio are valued over simply following others.	-	Factor in choosing a career.	FGD	Job Stability Expectations
Job demand and economic needs are key factors.	-	When opportunities for this factor are present, a career is considered.	FGD	Job Stability Expectations
Opportunities for overseas work are an option.	-	Overseas work is not the priority, but when chances arise, it will be grabbed.	FGD	Financial Necessity
Careers with the promise of high salary are considered.	-	With reservations of the fact that fresh grad students earn minimum.	FGD	Financial Necessity

TABLE XIII. CONVERGENCE AND DIVERGENCE RESULTS MAP

Topic/Theme	Subtopic	Survey Findings	FGD Findings	Convergence/Divergence /Expansion
Interest Level	Likelihood to pursue	Median: likely to pursue.	Likely to pursue but with reservations.	Convergence
	IT Careers ranking	ST rank among other IT jobs: 3rd out of 5.	Software development is prioritized.	Divergence
Career Motivation	Job opportunities	Salary expectations: 0.323*	Salary is most prioritized.	Convergence
	Overseas work	0.163*	Overseas work is greatly considered.	Convergence
	Job market demand	0.639*	Whatever job/career is available, they will take.	Expansion
	Personal interest	0.883*	Driven by personal wants and needs.	Convergence
Curriculum Exposure	University preparedness	Unsure of how university prepares students.	Feels students are not well equipped for the profession.	Expansion
	Frequency of discussion	Much less frequent than any other IT jobs.	Agree, only shallow introductions.	Convergence
	Curriculum inclusion	Limited exposure.	Agree, not given highlight in course.	Convergence
	Testing education	0.057*	Less exposed = less interest.	Convergence/Expansion
Testing perceptions	Perceived pros	Easier than development	Testers only "test" that's why it's easier.	Convergence
		Necessary in development.	Agrees that it is necessary in development.	Convergence
	Perceived cons	Tedious work: Agree.	Agrees it is repetitive, manual work.	Convergence
		Requires expertise: Agree.	Agree, needs to keep up with learning curve.	Convergence
		Critics of developers: Agree.	Agree, it is the nature of the role.	Convergence
		Limited learning opportunities: Agree.	Disagree, there is always something to learn in the field.	Divergence
		Limited recognition: ranks #4.	Agree, developers are seen as superior.	Convergence
		Prone to workplace conflict ranks #7.	Agree, due to nature of the role.	Convergence
Social and cultural influences	*Utang na loob*	Median: neutral effect on ST choices.	Agree, leaning towards fulfillment of self.	Convergence
	Bayanihan	No impact on career choice but greatly impacts job satisfaction if present in workplace.	Would choose a career that values teamwork.	Expansion
	Pakikisama	No impact on career choices but it is very important to maintain good relationships with colleagues.	Wants a job that maintains workplace harmony.	Expansion
	Familial obligations	*Utang na loob*: Mean of influence: Unimportant.	Still thinks of giving back but not does not feel the pressure to do so.	Convergence
	Peer influence	0.107*	Would consider but to an extent.	Convergence/Expansion

*Note. *p-level of interest level to likelihood in pursuing a career in ST.*

However, students are open to pursuing careers in software testing when provided with proper education and exposure, challenging the assumptions about fixed preferences and suggesting that curriculum reform could greatly influence their career choices. An emerging theme among approximately 70% of participants indicated that economic factors, particularly salary expectations and job availability, have become primary determinants in their career selection, especially considering the current economic landscape in the Philippines. This pragmatic approach implies that if software testing careers align with financial stability and market demand, they become attractive options regardless of traditional cultural considerations. Focus group discussions consistently highlighted this economic prioritization, signaling a shift toward practical career decision-making over cultural or solely academic influences.

The integration of quantitative and qualitative findings reveals convergent patterns confirming salary expectations and overseas work considerations as primary career motivators, while diverging on the perceived value of learning opportunities in software testing. Table XIII identifies that cultural evolution among Filipino families demonstrates a shift from traditional authoritative practices toward supportive approaches that encourage individual autonomy, fundamentally transforming contemporary career decision-making processes. These insights establish that software testing's limited appeal stems from systemic issues, including inadequate curriculum exposure, economic pressures, and prestige perceptions, rather than inherent cultural resistance, suggesting these barriers could be addressed through coordinated educational and industry interventions. The interconnected nature of cultural, economic, and curricular factors creates a complex decision-making environment where students must balance personal interests, family obligations, financial necessities, and available opportunities when evaluating software testing career paths.

V. Discussion

Filipino IT students align with global trends favoring software development over testing, but show distinct cultural adaptations. Traditional values like *utang na loob* have evolved from primary to secondary motivators, with students asserting personal autonomy: "For me, my parents never forced me to choose what they wanted." Unlike international studies showing strong parental influence, Filipino students demonstrate a generational shift toward individualistic decision-making, prioritizing economic stability over family expectations: "…it's not my priority when it comes to choosing a career, given the fact their satisfaction... wouldn't feed me or wouldn't pay my bills".

Pakikisama emerges as crucial in workplace dynamics rather than career selection, particularly in software testing environments requiring diplomatic collaboration. While global studies emphasize prestige concerns, Filipino students additionally highlight economic necessities and limited curriculum exposure as decisive factors, reflecting the Philippines' developing economy, where financial stability takes precedence over career prestige. Cultural factors serve more as workplace compatibility considerations than career determinants, suggesting economic realities and educational limitations supersede traditional cultural expectations in contemporary Filipino career decision-making.

The study shows that Filipino IT curricula provide limited and superficial exposure to software testing, with participants reporting that ST is only briefly mentioned without comprehensive discussions or hands-on experience. This contrasts with more developed educational systems, where software testing is integrated throughout the software development lifecycle curriculum with practical projects and industry partnerships. The lack of structured ST education in Philippine institutions creates knowledge gaps that prevent students from recognizing software testing as a viable and attractive career path.

The primary barriers preventing Filipino IT students from pursuing software testing careers include insufficient academic exposure, limited curricular focus, and a lack of comprehensive knowledge about the field's opportunities and requirements. Economic considerations such as salary expectations and job availability take precedence over career exploration, particularly given the current Philippine economic conditions. Educational institutions fail to provide adequate career guidance and real-world exposure to software testing, leaving students with misconceptions about the field's potential and professional growth opportunities.

Filipino cultural values such as *pakikisama*, *bayanihan*, and *utang na loob* demonstrate nuanced influences on software testing career perceptions, with participants acknowledging their importance in workplace dynamics but not as primary career decision factors. While *pakikisama* facilitates harmonious tester-developer relationships and *bayanihan* promotes collaborative problem-solving in testing environments, these cultural elements contrast with Western individualistic approaches that emphasize direct communication and personal achievement. The traditional concept of *utang na loob* as a career motivator has diminished among contemporary Filipino IT students, who prioritize personal goals and economic stability over family obligations, reflecting a shift from collectivist to more individualistic career decision-making patterns.

VI. Conclusion and Recommendations

This study reveals that Filipino IT students' disinterest in software testing careers stems from limited academic exposure, superficial curricular coverage, and prioritization of economic factors over career exploration. Cultural values like *pakikisama*, *bayanihan*, and *utang na loob* primarily influence workplace dynamics rather than career choice itself. The research demonstrates a generational shift, where contemporary students prioritize personal fulfillment and economic stability over traditional familial obligations, making career decisions based on salary potential, market demand, and personal interests. This study contributes to career development literature by employing a multidimensional, culturally sensitive framework that bridges quantitative and qualitative findings, extending existing models by revealing how cultural, economic, and academic contexts interact in collectivist settings.

Based on these findings, comprehensive reforms are necessary to address the identified barriers and enhance students' interest in software testing careers. The following

recommendations are organized into three critical areas that require coordinated implementation across multiple stakeholders to effectively transform how software testing is perceived, taught, and integrated into IT education.

A. Educational Reform

- Implement comprehensive curriculum reforms, integrating hands-on software testing modules throughout IT programs
- Mandate CHED integration of software testing courses beginning in the second-year IT programs nationwide
- Develop faculty development programs to enhance testing pedagogy and industry-aligned teaching methodologies

B. Industry Partnership and Policy Development

- Establish strategic industry partnerships for internships, mentorship programs, and co-designed curricula that bridge academic learning with real-world testing practices
- Develop collaborative research initiatives where academia and industry jointly address software quality challenges, providing students with exposure to cutting-edge testing methodologies
- Implement targeted career guidance programs highlighting testing opportunities, competitive compensation, and professional growth trajectories through industry practitioner engagement

C. Future Research Directions

- Conduct longitudinal studies examining evolving student perceptions as curriculum reforms and industry partnerships are implemented.
- Validate the revised CEC-IRTC model through empirical testing in different cultural and educational contexts.
- Investigate the effectiveness of specific industry-academia collaborative models in shifting student career preferences toward software testing.

The proposed reforms require coordinated implementation across multiple stakeholders, with industry-academia collaboration serving as the critical bridge between curriculum development and workforce readiness. CHED curriculum integration provides the foundational policy framework, while sustained industry partnerships ensure that educational reforms remain responsive to market demands and provide students with authentic pathways into software testing careers. This collaborative approach transforms software testing education from an isolated academic concern into a shared responsibility between educational institutions and the IT industry, ultimately strengthening the software quality ecosystem in the Philippines.

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