The Preparedness of Software Engineering Graduates: Perspectives from Academia and Industry

I. APPENDIX A: COURSE ASSESSMENT REPORTS

After the filtering process, the finalized dataset comprised 42,800 individual student feedback entries and 4,978 distinct faculty comments. Table I provides representative examples extracted from the course assessment reports. The examples illustrate the depth of insights collected from both student and faculty perspectives, highlighting key issues in curriculum delivery, skill acquisition, and course alignment with professional practice.

TABLE I: Representative Examples from Course Assessment Reports

Course	Detailed Feedback Examples	Level
Software Requirements Engineering	*The course provided thorough theoretical knowledge, but there was insufficient focus on practical techniques such as eliciting requirements directly from clients or using modern tools like Jira or Trello.* (Student, China)	Bachelor
Object-Oriented Programming	*Students generally grasped programming concepts well, but several students indicated difficulty in applying object-oriented principles in real-world project contexts, suggesting the need for more hands-on workshops or project-driven teaching approaches.* (Faculty, Australia)	Bachelor
	The Agile methodology was taught comprehensively, but students indicated that the absence of authentic collaboration experiences diminished the course's practical effectiveness. (Faculty, China)	Master
	Students repeatedly emphasized lectures were overly theoretical and requested additional industry-relevant architectural design assignments and exercises. (Faculty, Australia)	Master
Software Testing and Quality Assurance	*Laboratory exercises in testing automation and continuous integration were highly beneficial, but I requested more exposure to industry-standard tools like Selenium and Jenkins.* (Student, USA)	Master
Web Application Development	*The curriculum was updated effectively to cover recent JavaScript frameworks such as React and Angular, but the challenge of covering too many frameworks superficially rather than focusing deeply on one or two.* (Student, China)	Bachelor
Software Project Management	*Students highlighted the effectiveness of case studies, but there was notable feedback requesting more emphasis on actual project planning and risk management scenarios reflecting industry complexity.* (Faculty, USA)	Ph.D.
	The theoretical aspects were robust, but I struggled with practical application due to limited opportunities to implement design solutions in realistic projects. (Student, Australia)	Master
Cloud Computing	*The theoretical knowledge about cloud infrastructure is extensive, but I suggest that practical experience with specific cloud platforms (e.g., AWS, Azure) is lacking and needs more integration.* (Student, USA)	Master
Database Systems	*SQL training is solid; however, students feel inadequately prepared for NoSQL and cloud-based database systems, which are increasingly required in the industry.* (Faculty, Australia)	Bachelor
DevOps Practices	*The course effectively covered core concepts, but my classmates and I recommended increased exposure to containerization technologies (Docker, Kubernetes) to align closely with current industry practices.* (Student, China)	Ph.D.

II. APPENDIX B: SKILLS GAP (RQ1)

We conducted in-depth interviews lasting approximately 20 to 40 minutes. The semi-structured format allowed participants to elaborate on key points identified in their questionnaire responses, facilitating a deeper exploration of underlying issues, gaps, and expectations from educational programs. The interview questions for both graduates and senior engineers were carefully categorized into five thematic dimensions, each containing 4–6 detailed questions to facilitate a structured and comprehensive analysis. These categories and representative interview questions are presented in Tables II and III.

TABLE II: Categories and Sample Interview Questions for Graduates

Category	Sample Questions
Curriculum Relevance	• How relevant do you find your coursework to your current job? • Which courses do you believe were most beneficial in your career preparation? • Which specific skills do you think were underrepresented in your coursework? • How well did your program prepare you for actual industry tasks?
Practical Experience	• Did your curriculum provide sufficient practical experiences? • What challenges did you encounter when applying academic knowledge in practical settings? • Can you recall specific instances where lack of practical experience hindered your performance? • What additional practical exercises would you suggest for the curriculum?
Use of Industry Tools	• Which industry-standard tools were you exposed to during your studies? • Did you feel proficient in using these tools upon graduation? • Were there any tools or technologies you encountered at work that were absent in your education? • How could your program better integrate industry-standard tools?
Soft Skills Development	• Were teamwork and communication skills sufficiently emphasized in your program? • How prepared did you feel to collaborate effectively in a professional team environment? • Can you provide examples of soft skills that you found lacking upon entering the workforce? • What improvements would you suggest regarding soft skills training?
Suggestions and Improvements	• If you could modify your curriculum, what key changes would you recommend? • What advice would you give to educators to enhance industry readiness? • Were there specific teaching methods or content areas you felt needed improvement? • How can industry partnerships enhance the learning experience for future students?

TABLE III: Categories and Sample Interview Questions for Senior Engineers

Category	Sample Questions
Technical Competency	• How would you rate the technical competency of recent graduates you supervised? • Which technical skills are most frequently lacking among new graduates? • Are there fundamental areas where recent graduates consistently struggle? • Can you give examples where graduates were unprepared for specific technical tasks?
Practical Skills	• Do graduates possess adequate practical coding skills upon joining your team? • How quickly do recent graduates adapt to practical development processes? • Are graduates sufficiently experienced in using key industry-standard software tools? • What specific practical exercises would you recommend universities include?
Professional Soft Skills	• How effective are recent graduates in professional communication and teamwork? • What soft skills do you find consistently deficient among new graduates? • Can you share examples of how insufficient soft skills have impacted workplace outcomes? • How can universities better address these gaps?
Curriculum and Industry Alignment	• Do you see a clear alignment between university curricula and actual industry requirements? • What specific academic content or practices are currently misaligned with industry demands? • How closely do course contents reflect real-world software development tasks? • Are there skills currently taught that are less relevant or outdated?
Recommendations	• What specific suggestions would you give academic institutions to improve graduate readiness? • How can closer collaboration between industry and academia benefit both parties? • Are there exemplary practices from industry training programs universities should adopt? • What changes in academic assessments would help better prepare graduates?