



**Sindh Early Learning Enhancement through Classroom Transformation  
(SELECT)  
Sindh Education and Literacy Department (SELD)  
Government of Sindh (GoS)**



**Terms of References**

**Software Quality Assurance Engineer**

**Project Background:**

The SELECT Project encompasses a multi-pronged approach towards improving the quality of both teaching and learning practices in primary education, with a particular emphasis on foundational reading in grades 1 through 5. The Project comprises a series of focused and flexible implementation strategies, targeted at the school and meso-levels (personnel and systems at the school, taluka and district levels). The Project supports improvements in the transition from primary to elementary school, as well as a reduction in dropouts through targeted student attendance redress procedures. Desired Project outcomes would eventually contribute to reductions in learning poverty and in the number of out-of-school children.

(Original) Main Project Amount	IDA: US\$100 million GPE ESPIG: US\$29.9875 million GPE MG: \$24.775 million Total: US\$154.7625 million
Expected Project Duration	August 2021 – April 2026

Project Objectives	The overall development objective of this Project is to improve the reading skills of early grade primary students and increase student retention in primary schools in selected districts.
Project Cost	IDA: US\$100 million GPE ESPIG: US\$29.9875 million GPE MG: \$24.775 million Total: US\$154.7625 million
Expected Project Duration	August 2021 – April 2026
Component 1	<p>Transforming teaching practices in the early grades</p> <ul style="list-style-type: none"> <li>• <u>Subcomponent 1.1:</u> Implementation of a Continuous Professional Development (CPD) model for improved literacy skills in the early grades</li> <li>• <u>Subcomponent 1.2:</u> Behavioral nudges for improved learning</li> <li>• <u>Subcomponent 1.3:</u> Technical Assistance (TA) for transforming teaching practices</li> </ul> <p>Under this component, a CPD model will be implemented with the aim of improving literacy skills in early grades. Behavioral nudges will be utilized to improve student wellbeing and mitigate potential risks of dropping out. TA will also be provided for institutional capacity building and support.</p>
Component 2	Improving the physical learning environment in selected primary schools, and upgrading them from grade 5 to grade 8, supporting the teaching and learning aims set out in Component 1 and the student retention aims set out in Component 3. Cost-effective and carbon-efficient technologies will be utilized to introduce needed climate adaptations and mitigate climate risk.
Component 3	<p>Improving system capacity for effective school leadership and management support:</p> <ul style="list-style-type: none"> <li>• <u>Subcomponent 3.1:</u> Establishing a technology-based student attendance monitoring system</li> </ul>

	<ul style="list-style-type: none"> <li>• <u>Subcomponent 3.2</u>: TA and capacity building for school leadership and local education office management to mitigate student dropout</li> </ul> <p>A technology-based student attendance monitoring system will be established. TA will be provided, and capacity building will take place for school leadership and local education office management increase their ability to use school-level data in conjunction with Component 1 activities to mitigate student dropout.</p>
Component 4	The Reform Support Unit (RSU) will monitor and evaluate the Project, monitor safeguards, oversee procurement and financial management, and will be responsible for overall management and coordination of the Project on behalf of the School Education and Literacy Department (SELD).
Geographic Scope	The Project will be implemented in twelve selected districts in Sindh: Badin, Ghotki, Jacobabad, Kambar-Shahdadkot, Kashmore, Mirpurkhas, Mitiari, Sanghar, Shikarpur, Sujawal, Tando Muhammad Khan, and Thatta.

## 1. Implementation Arrangement

The Project will be implemented by SELD of the Government of Sindh (GoS), through the Project Management and Implementation Unit (PMIU). This will be housed in the RSU, which will monitor overall implementation of Project activities with TA support. The RSU will be headed by the CPM (Chief Programme Manager) who will be responsible for providing overall Supervision.

The design, implementation planning and construction supervision activities for the Component will be managed through the consulting firm. The firm will be hired by the RSU and will be responsible for conducting needs assessment, preparing site-specific master plans and detailed designs and drawings, construction supervision and quality assurance of the Project.

## 2. Scope of Work

The scope of work for a Software Quality Assurance (SQA) Engineer encompasses a wide range of responsibilities aimed at ensuring the quality, reliability, and performance of software products throughout the development lifecycle. Here is an overview of the typical scope of work for an SQA Engineer:

**Direct supervision and directions of the Project Director/Component Lead the SQA Engineer shall undertake the following tasks and responsibilities:**

### ✓ Module Testing:

- Develop, document, and execute test cases and test plans covering both functional and technical aspects of the web and mobile applications.
- Ensure that applications meet user experience requirements, including user interface (UI/UX) testing.
- Collaborate with the development team to report, track defects, and ensure their timely resolution.
- Conduct regression testing to verify the resolution of reported issues and prevent regression errors.
- Investigate and reproduce customer-reported issues to diagnose root causes.
- Validate data integrity and consistency in web and mobile applications.
- Provide clear and detailed bug reports and document test results for reporting and tracking purposes.
- Design and execute performance-testing strategies to evaluate software scalability, reliability, and responsiveness.

- Use tools like J Meter, Load Runner, or Gatling to simulate user traffic and measure system performance under various load conditions.
  - Analyze performance test results and identify bottlenecks or areas for optimization.
- ✓ **Technical Expertise:**
- Strong ‘hands on’ experience developing software tests for functional, performance, and regression testing that include automated and ad-hoc testing elements.
  - Experience with focus on Automation Testing using Gherkin/Testing, Cucumber & Selenium.
  - Familiar with programming languages PHP/ Laravel, JavaScript, jQuery.
  - Experience of REST, CURL APIs testing.
  - Translate operational requirements & prototypes into test cases.
  - Track performance of each delivered module in terms of number of bugs & severity of bugs.
- ✓ **Integration and Collaboration:**
- Understanding Continuous Integration/Continuous Development pipelines and how to integrate testing processes into the development workflow is becoming increasingly important for SQA Engineers to ensure rapid and reliable software delivery
  - SQA Engineer should possess strong analytical and problem-solving skills to identify potential issues, troubleshoot problems, and propose effective solutions to enhance software quality
  - Familiarity with defect tracking and management tools such as Jira, Bugzilla, and HP Quality Center is important for SQA Engineers to document and prioritize issues encountered during testing
- ✓ **Quality Assurance:**
- Understanding of QA processes, best practices, and methodologies such as Agile, Scrum, and Kanban.
  - Strong communication skills to work effectively with cross-functional teams including developers, project managers, and stakeholders.
  - Responsible to ensure 100% of test cases are accounted for in the documentation. All resolved, historic & unresolved bugs are available to the project management for the life of the systems.
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**The SQA Engineer is accountable for delivering the following outputs:**

- Detailed documents outlining the overall testing strategy, objectives, scope, resources, and schedule for the project.
- Test plans may include information about test environments, test data, testing methodologies, and acceptance criteria.
- Test scripts automate repetitive test cases to streamline the testing process and improve efficiency
- Individual test cases and test suites designed to validate specific functionalities, features, or scenarios of the software application.
- Detailed documentation of identified defects, issues, and anomalies encountered during testing.
- Defect reports typically include information about the defect severity, priority, steps to reproduce, screenshots, and any additional supporting evidence
- Sets of test cases designed to ensure that software changes and enhancements do not introduce new defects or regressions.
- Documentation of testing processes, methodologies, best practices, and lessons learned throughout the project lifecycle.
- Knowledge sharing sessions, training materials, or workshops aimed at disseminating testing knowledge and expertise to team members and stakeholders
- Recommendations for process improvements, optimization strategies, and areas for enhancement based on testing insights and feedback.

- Participation in meetings and continuous improvement forums to reflect on past experiences and identify opportunities for improvement
- Any other information related to the SQA Engineer.

## **Qualifications of the Successful Individual**

**Education:** Minimum 16 years of education from an HEC recognized university with in Computer Science / Information technology or in any relevant discipline from HEC recognized university.

**Additionally, candidates should possess certification in Software Quality Assurance or have undertaken an advanced degree in Software Quality Assurance.**

**Experience:** At least 05 or more years of experience in software quality assurance roles, with a track record of successfully leading testing efforts for complex projects.

- Proficiency in software testing methodologies, techniques, and best practices
- Familiar in MVC, JavaScript, Bootstrap Frameworks and External Libraries, commonly used in software development.
- Knowledge of test management and defect tracking tools like Jira, HP ALM, or TestRail.
- Familiarity with version control systems such as Git for managing test scripts and code.
- Ability to analyze complex systems, identify potential issues, and develop effective testing strategies.
- Strong problem-solving skills to troubleshoot defects and collaborate with development teams to find solutions
- Careful attention to detail to ensure thorough testing coverage and accurate defect reporting.
- Excellent written and verbal communication skills to articulate testing strategies, document test cases, and communicate effectively with cross-functional teams
- Ability to work collaboratively in a team environment, share knowledge, and contribute to a positive and productive work culture
- Willingness to adapt to new technologies, tools, and methodologies in the rapidly evolving field of software quality assurance.