

RP LEARNING PORTAL – MASTER PROJECT SPECIFICATION DOCUMENT (FINAL V2.1)

1. Executive Project Overview

Project Vision: To build a premier, enterprise-grade academic learning SaaS platform designed for high-performance online and in-person education. RP Learning Portal bridges the gap between dynamic teaching methodologies, rigorous academic performance tracking, and transparent parent engagement.

Business Objectives:

- Launch Version 1 as a **Single-School Architecture** dedicated exclusively to RP Learning Academy, ensuring rapid deployment, reduced complexity, and streamlined management.
- **SaaS Readiness Mandate:** All primary operational tables must be designed with future tenant_id compatibility in mind to allow migration to a multi-tenant SaaS architecture in Version 2 without requiring structural redesign.
- Automate financial workflows, parent invoicing, and a sophisticated **Teacher Payroll & Dynamic Administration Fee** system.
- Provide seamless support for flexible academic models: 1:1 tutoring, 1:Many class teaching, Many:1 multi-disciplinary teaching, and Many:Many cohort teaching.

Educational Objectives:

- Implement an Overall Performance Score (OPS) that evaluates students holistically on exams, assignments, attendance, participation, and academic behavior.
- Foster student growth through Student Goals, Improvement Plans, and Gamified Milestones (streaks, reward tiers).
- **Strict Academic Focus:** The platform is exclusively for academic teaching and learning. It does not support clinical, therapeutic, or counseling operations.

Success Criteria:

- 100% automated OPS calculation leveraging high-speed caching and dashboard snapshots.
- Flawless historical integrity during Teacher Reassignments and Payroll rate changes.
- Frictionless parent engagement via the Parent Command Center and Action Items.
- Resilient Backup & Disaster Recovery protocols ensuring zero data loss.

2. Complete Functional Requirements

Super Admin / Executive:

- Access Executive Dashboards covering revenue growth, operational KPIs, teacher utilization, and enrollment trends.
- Manage high-level system configurations and prepare for future multi-school expansion.

School Admin:

- Full CRUD operations for users (Teachers, Students, Parents).
- Manage academic structures (Years, Terms, Classes, Subjects, **Timetables**).
- Configure OPS weights, financial fee structures, and Teacher Compensation Settings (Dynamic Admin Fees).
- Access platform-wide analytics, comprehensive Audit Logs, Payroll reporting, and BI dashboards.
- Customize school-specific branding (logos, colors, report cards, invoices).

Teachers:

- Manage assigned students and classes across flexible teaching models (1:1, group, multi-teacher).
- Upload academic resources to the categorized Resource Library.
- Create, schedule, and grade assignments, quizzes, and exams.
- Manage **Class Sessions** (schedule online/in-person meetings) and log detailed attendance.
- Submit academic progress reports and manage Student Goals & Intervention Plans.
- Award points, track streaks, and issue achievement badges.
- Monitor personal workload, **Performance Metrics**, and view historical Payroll & Net Earnings reports.
- Communicate with students and parents via direct messaging and announcements.

Students:

- Access learning materials, submit assignments, and take quizzes/exams.
- View personal dashboard featuring OPS, current rank, streaks, and goal progress.
- Track gamification progress across Achievement Levels (Bronze to Diamond).
- View subject-specific, class, and school-wide leaderboards.

Parents:

- Access the Parent Command Center with a "Child Switcher" for multiple dependents.
- View transparent OPS breakdowns ("Why is my child ranked #X?").
- Track student goals, attendance, and receive Parent Action Items (recommended follow-ups from teachers).

- View invoices, execute online payments, and download **Payment Receipts**.
- Communicate with teachers via direct messages.

3. Complete Module Inventory

1. **Authentication & Identity** (Login, RBAC, User Profiles, Qualifications)
2. **Academic Hierarchy** (Years, Terms, Subjects, Classes, Enrollments)
3. **Scheduling & Timetables** (Class Timetables, Teacher Availability, Class Sessions)
4. **Flexible Teaching Assignment Engine** (Direct assignments, Class assignments, Reassignment History)
5. **LMS Core** (Assignments, Quizzes, Exams, Submissions, Grading)
6. **Live & In-Person Classroom** (Zoom API, Session Management, Mode-specific Attendance)
7. **Resource Library** (Categorized document/media storage)
8. **OPS Performance Intelligence** (Dynamic scoring, Dashboard Snapshots, Leaderboards)
9. **Gamification & Rewards Engine** (Points, Streaks, Tiers, Teacher Recognition)
10. **Goal & Intervention Tracking** (Student Goals, Intervention Plans, Action Reviews)
11. **Parent Engagement Module** (Command Center, Parent Action Items)
12. **Financial Management** (Fee categories, Invoices, Invoice Items, Payments, Receipts)
13. **Payroll & Compensation Module** (Gross/Net calcs, Dynamic Admin Fees, Payment History)
14. **Advanced Communications** (2-way chat, Broadcasts, SMS/Email Logs, Attachments)
15. **Certificate System** (Automated branded PDF certificates)
16. **Enterprise Audit & Compliance** (Strict before/after tracking for grades, financials, settings)
17. **Reporting & Analytics** (Student, Parent, Teacher KPIs, Admin, Executive levels)
18. **Business Intelligence (BI) Readiness** (Fact tables, analytics snapshots)
19. **AI & Automation Readiness** (Risk scores, predictions, recommendations)
20. **Disaster Recovery** (Automated backups, retention policies)

4. Complete Database Blueprint (Single School V1 with SaaS V2 Readiness)

A. Core Configuration & Identity

- school_settings: id, school_name, logo_path, branding_config, contact_info.
- users: id, name, email, password, phone, status, avatar.
- roles / permissions / model_has_roles: (*Spatie RBAC*).
- user_profiles: id, user_id, qualifications, bio.

- parent_student: parent_id, student_id.

B. Scheduling & Flexible Teaching Assignments

- teacher_availability: id, teacher_id, day_of_week, start_time, end_time.
- class_timetables: id, class_id, subject_id, teacher_id, day_of_week, start_time, end_time, room_location.
- teacher_subject_assignments: id, teacher_id, subject_id, class_id.
- teacher_student_assignments: id, teacher_id, student_id, subject_id, status.
- teacher_student_assignment_history: id, teacher_id, student_id, subject_id, start_date, end_date, reason.

C. Academic Structure & Class Sessions

- academic_years: id, name, start_date, end_date, is_active.
- academic_year_terms: id, academic_year_id, name, start_date, end_date, is_active.
- classes: id, name, capacity.
- subjects: id, name, code.
- student_class_enrollments: id, student_id, class_id, academic_year_id, academic_term_id, status.
- student_subject_enrollments: id, student_id, subject_id, academic_year_id, status.
- class_sessions: id, class_id, subject_id, teacher_id, session_type (online/in-person), session_date, start_time, end_time, zoom_link, location, status.

D. Payroll, Finance & Teacher Compensation

- fee_categories: id, name, description.
- fee_structures: id, fee_category_id, amount, due_date.
- student_fee_assignments: id, student_id, fee_structure_id, status.
- invoices: id, student_id, parent_id, invoice_number, total_amount, status, due_date.
- invoice_items: id, invoice_id, fee_category_id, description, amount.
- payments: id, invoice_id, parent_id, amount, payment_method, status.
- payment_receipts: id, payment_id, receipt_number, pdf_path, generated_at.
- teacher_compensation_settings: id, teacher_id, admin_fee_enabled, admin_fee_percentage.
- payroll_periods: id, name, start_date, end_date, status.
- payroll_calculations: id, teacher_id, payroll_period_id, gross_earnings, admin_fee_amount, net_earnings, applied_admin_fee_percentage.
- payroll_transactions / payroll_adjustments / payroll_audit_logs.

E. Parent Engagement & Student Goals

- parent_action_items: id, parent_id, student_id, teacher_id, action_title, description, due_date, status.
- parent_action_item_logs: id, action_item_id, status_change, notes, created_at.
- student_goals: id, student_id, teacher_id, title, target_date, status.
- goal_progress: id, goal_id, notes, progress_percentage, logged_at.
- intervention_plans: id, student_id, teacher_id, reason, start_date, status.
- intervention_actions: id, plan_id, action_taken, result, date.

F. Gamification, LMS & Assessments

- reward_levels: id, name (Bronze to Diamond), min_points.
- student_streaks: id, student_id, current_streak, longest_streak, last_activity_date.
- achievement_milestones / student_points.
- resource_categories: id, name, description.
- resources: id, teacher_id, subject_id, category_id, title, file_path, type.
- assignments / quizzes / submissions / exams / exam_results.

G. Communications (Advanced)

- conversations / conversation_participants / messages / message_attachments.
- announcements: id, title, body, target_role, created_by.
- announcement_reads / email_logs / sms_logs / notification_preferences.

H. Performance Intelligence & KPIs

- attendance: id, student_id, teacher_id, class_session_id, class_id, subject_id, attendance_date, status, mode (online/in-person), remarks.
- teacher_reports: id, teacher_id, student_id, type, academic_notes, behavior_notes.
- student_ops_scores: student_id, total_score, current_rank, performance_trend.
- student_dashboard_snapshots: id, student_id, ops_score, rank, attendance_rate, current_streak, cached_data_json, generated_at.
- teacher_performance_metrics: id, teacher_id, period_start, period_end, assignments_graded, reports_submitted, attendance_records_logged, student_average_growth, calculated_score.
- teacher_rewards / teacher_recognition.

I. Enterprise Audit, BI & AI Readiness

- audit_logs: id, user_id, action, module, ip_address, created_at.
- audit_log_details: id, audit_log_id, record_id, field_name, before_value, after_value, reason.
- analytics_snapshots / dashboard_cache / fact_student_performance / fact_attendance / fact_finance.
- student_risk_scores / student_recommendations / ai_predictions.

J. Settings & System

- settings: id, key, value, group.
- calendar_events / certificates.

5. ERD and SaaS Multi-Tenant Readiness

- **Flexible Teaching Logic:** The architecture effortlessly supports 1:1, 1:M, M:1, and M:M through sophisticated pivot tables (class_timetables, teacher_student_assignments).
- **Historical Integrity:** When a teacher is reassigned, active records are closed and moved to teacher_student_assignment_history. Payroll records, attendance, and grades remain immutable and linked to the original teacher.
- **SaaS V2 Readiness:** While V1 is single-school, **every primary operational table is designed with the foresight for a tenant_id injection**. Foreign keys and indexes are structured so that Version 2 can migrate to a multi-tenant environment without a structural overhaul.

6. Parent Portal Specification

- **Command Center:** A centralized dashboard displaying a unified view of the household driven by the student_dashboard_snapshots table for lightning-fast loading.
- **Child Switching:** A dropdown allowing seamless state-switching between enrolled dependents.
- **Academic & Goal Monitoring:** Track goal progress, attendance, and view transparent OPS breakdowns.
- **Parent Action Items:** A dedicated widget showing teacher-assigned follow-up tasks (e.g., "Review Math Homework").
- **Financial Oversight:** View generated invoices (invoice_items breakdown), make payments online, and download payment_receipts.
- **Communication:** Direct messaging with attachments and school-wide announcements.

7. Teacher Workspace Specification

- **Class & Schedule Management:** View teacher_availability, manage class_timetables, and launch class_sessions (online or in-person).
- **Assessment Management:** Create and grade assignments/exams. Upload to resource_categories.
- **Holistic Evaluation:** Log attendance with delivery mode flags. Submit behavioral reports and update intervention_plans.
- **Gamification:** Award points, track student streaks, and monitor own teacher_performance_metrics and recognition awards.

- **Payroll Dashboard:** View Gross Earnings, Dynamic Administration Fee deductions, and Net Earnings historically.

8. Student Portal Specification

- **Performance Dashboard:** Visually engaging interface fed by student_dashboard_snapshots highlighting current OPS, class rank, streaks, and gamification tiers.
- **Learning Hub:** Access scheduled class_sessions (Zoom links or room locations), assignments, and the Resource Library.
- **Gamification Display:** A digital trophy case for earned certificates, badges, and progress toward goals.
- **Leaderboards:** Real-time peer-comparative rankings.

9. Finance & Payroll Module Specification

- **Student Billing:** Dynamic generation of invoices with granular invoice_items based on assigned fee_structures. Generates secure payment_receipts.
- **Teacher Payroll System:**
 - Calculates Gross Earnings from logged class_sessions and 1:1 assignments.
 - Applies **Dynamic Administration Fee** (customizable per teacher, e.g., 5%, 8.75%) captured exactly at payroll execution to preserve historical math.
 - Calculates Net Earnings.
 - Generates payroll_transactions and maintains a strict audit_log_details history for any percentage changes.

10. OPS Performance Intelligence Engine

- **Calculation Triggers:** OPS is calculated *only* when an underlying metric changes (Exam graded, attendance logged).
- **Caching:** Results are immediately written to student_ops_scores and student_dashboard_snapshots to guarantee instantaneous loading across all portals.
- **Weight Configuration:** Stored in the settings table (e.g., Exams 30%, Assignments 20%, Attendance 10%).

11. Dashboard KPI Specifications

Executive / Super Admin Dashboard:

- **KPIs:** Monthly Recurring Revenue (MRR), Total Outstanding Balances, Teacher Utilization Rate, Overall Platform Attendance %.
- **Charts:** Revenue Growth, Enrollment Trends, BI Analytics Snapshots.

School Admin Dashboard:

- *KPIs:* Pending Invoices, Unassigned Students, Payroll Gross vs. Net (Admin Revenue), Active Interventions.
- *Actions:* Trigger Payroll, Broadcast Announcements, Audit Log Alerts.

Teacher Dashboard:

- *KPIs:* Assigned Students Count, Upcoming class_sessions, Net Earnings (MTD), Teacher KPI Score.
- *Widgets:* Timetable, At-Risk Student Alerts, Unread Messages.

Student Dashboard:

- *KPIs:* Current OPS (%), Class Rank, Current Streak (Days), Points to Next Tier.
- *Widgets:* Upcoming Deadlines, Recent Badges Earned, Subject Leaderboard.

Parent Command Center:

- *KPIs:* Current Child OPS, Attendance %, Outstanding Fees, Uncompleted parent_action_items.
- *Widgets:* Child Switcher, Teacher Remarks Feed, Goal Progress Bars, Invoice Quick-Pay.

12. Brand System

- **Colors:** * Primary #0B3A66 (Deep Academic Blue)
 - Secondary #1E5FA8 (Royal Blue)
 - Accent #D4A017 (Academic Gold)
 - Background #F5F7FA (Light Grey)
 - Text #1E293B (Dark Navy)
 - Feedback: #22C55E (Success), #F59E0B (Warning), #DC2626 (Danger)
- **Typography:** Poppins (Headings) and Inter (Body).
- **UI Style:** Modern SaaS. Clean, card-based layouts with smooth transitions, large readable KPIs, and gamification elements utilizing the Accent Gold.

13. Backup & Disaster Recovery

- **Database Backups:** Automated daily incremental backups and weekly full DB dumps.
- **Retention Policy:** 30-day rolling retention for all backups.
- **Storage Strategy:** Backups automatically pushed to secure, off-site cloud storage (AWS S3 or Google Cloud Storage) independent of the primary hosting environment.
- **Disaster Recovery:** Documented runbooks for rapid database restoration, failover protocols, and verifiable test restorations conducted quarterly.
- **Audit Integrity:** audit_logs are write-only to ensure forensic integrity in the event of system breaches or data corruption.

14. Deployment Architecture

- **Stack:** Laravel 11, PHP 8.3+, MySQL 8.0+.
- **Environment:** VPS / cPanel Deployment.
- **Cron Jobs:** Single schedule:run command executing background tasks for Email Queues, OPS recalculation cleanup, Intervention Triggers, and Payroll generation.
- **Storage:** Local storage via symlink for avatars, PDFs, and Certificates.

15. Development Roadmap

- **Milestone 1:** Foundation (Laravel, Auth, RBAC, Settings, Audits, Master UI).
- **Milestone 2:** Academic Core & Scheduling (Timetables, Enrollments, Reassignment History).
- **Milestone 3:** LMS & Sessions (Resource Library, Assignments, Exams, Class Sessions, Zoom).
- **Milestone 4:** OPS Intelligence & Gamification (Dashboard Snapshots, Goals, Streaks, Tiers).
- **Milestone 5:** Finance & Payroll (Dynamic Admin Fees, Invoicing, Receipts).
- **Milestone 6:** Parent Command Center (Action items, Child Switcher).
- **Milestone 7:** Advanced Communications (Messaging, Attachments, Announcements).
- **Milestone 8:** Analytics, KPIs, and BI/AI Structure Implementation.

16. Final Master Blueprint Declaration

This document is the definitive, consolidated source of truth for the **RP Learning Portal Enterprise Architecture (V2.1)**. It encompasses all approved business logic, the Single-School V1 deployment strategy with V2 SaaS readiness, complete Payroll and Administration Fee architectures, advanced scheduling and attendance routing, enterprise Audit and Disaster Recovery protocols, and the strict RP Learning visual brand identity. It serves as the official foundation for code generation.