

# Product Requirements Document: Personalized Learning Platform for Thai Grade 4 & 6 Students (Mathematics & Technology)

## Purpose & Vision

This MVP will provide Thai students in grades 4 and 6 with a personalized learning platform for mathematics and technology subjects. The system should allow students to practise skills at their own pace, receive immediate feedback, and build confidence. Parents and teachers will be able to monitor progress and generate practice exams on demand. The longer-term vision is to create a scalable platform that supports more subjects and grades while remaining aligned to Thailand's education curriculum.

## Background & Inspiration

The product draws inspiration from IXL, a leading personalized learning platform. IXL offers a comprehensive curriculum, targeted recommendations and adaptive skills. It provides instructional resources, a state-of-the-art assessment suite and actionable analytics <sup>1</sup>. Its Real-Time Diagnostic pinpoints what students know and creates personalized action plans <sup>2</sup>; students receive engaging questions and positive reinforcement <sup>3</sup>. IXL Analytics groups students with similar needs and offers reports such as Trouble Spots and Progress & Improvement <sup>4</sup>. Instructional resources include video tutorials and step-by-step explanations; students get immediate feedback and suggestions for foundational skills when they answer incorrectly <sup>5</sup> <sup>6</sup>. Additional features such as SmartScore to monitor progress, assignment suggestions, personalized skill plans, Group Jam, Live Classroom and leaderboards energize instruction <sup>7</sup> <sup>8</sup> <sup>9</sup>. IXL Quizzes let teachers build custom assessments by choosing skills and difficulty levels, with options to randomise questions and manage active quizzes <sup>10</sup> <sup>11</sup>.

## Users & Personas

Persona	Description	Goals
<b>Students</b>	Primary school pupils in Grade 4 or Grade 6 in Thailand. They access the platform via web or tablet, practise math and technology skills and want an enjoyable, adaptive learning experience.	Master grade-appropriate topics; receive immediate feedback; earn badges and track progress.
<b>Parents</b>	Caregivers who support their child's education. They may not be subject experts but want to help children practise and monitor progress.	View progress and analytics, assign practice topics, generate practice exams.

Persona	Description	Goals
<b>Teachers/ Tutors</b>	Classroom teachers or private tutors managing multiple students.	Assign skills, view class progress, identify trouble spots, generate custom practice exams and review student answers.

## Goals & Success Metrics

- **Learning outcomes:** Increase students' mastery in the covered topics. Similar to IXL's SmartScore, proficiency will be reached when a student attains a score of  $\geq 80$  <sup>7</sup>.
- **Adoption:** Both parents and teachers should find the tool easy to use. Success can be measured via the number of practice sessions and exams generated.
- **Time to MVP:** Build a functional prototype within 10 weeks (see indicative milestones).

## Scope of MVP

### Curriculum & Topics

- **Mathematics:** Align content with Thailand's Basic Education Core Curriculum 2008. The curriculum lists numbers and operations, measurement, geometry, algebra and data analysis & probability as core areas <sup>12</sup>. Grade-specific topics include:
- **Grade 4:** Multiplication and division, fractions and decimals, basic geometry (angles, triangles, quadrilaterals and circles), measurement of length, area and volume, and interpreting bar charts.
- **Grade 6:** Ratios and percentages, variable expressions and simple equations, fractions and decimals to three decimal places, area and volume of prisms and cylinders, graphing and data interpretation, and solving problems involving patterns <sup>13</sup>.
- **Technology:** Use the Occupations and Technology learning standards. Key strands are:
- **Design and Technology:** Understand technology processes, design and create objects or methodologies, and use technology beneficially <sup>14</sup>.
- **Information and Communication Technology (ICT):** Teach efficient and ethical use of information technology for searching, communication and problem-solving <sup>15</sup>.
- Optional topics: digital citizenship and safety, basic algorithms and block-based coding, introductory robotics.

### Core Functional Requirements

1. **User roles & accounts**
2. Student accounts (optionally parent-managed). Students see a dashboard summarising their practice history and proficiency by topic.
3. Parent accounts link to one or more students; parents can view detailed analytics, assign topics and create practice exams.
4. Teacher accounts allow creation of classes, enrolment of students, assignment of skills, and viewing of aggregated progress and trouble-spot reports.
5. **Adaptive practice modules**

6. Each topic consists of interactive questions that adapt in difficulty. A scoring algorithm inspired by IXL's SmartScore increases as students answer correctly and decreases after mistakes <sup>7</sup> . Proficiency (score  $\geq 80$ ) signals that the student has mastered the skill.
7. Immediate feedback shows students where they went wrong and provides step-by-step explanations <sup>5</sup> . The system suggests foundational skills when students need additional support <sup>6</sup> .
8. "Learn with an example" and "Watch a video" buttons allow students to view worked examples or short video lessons <sup>16</sup> .

#### **9. On-demand practice exam generator**

10. Students, parents or teachers can create practice exams on the fly. Select subject (math or technology), grade level, topics, difficulty and number of questions.
11. Questions are pulled from the bank or generated algorithmically, similar to IXL Quizzes where teachers can build custom assessments quickly <sup>10</sup> .
12. Options include randomising question order and setting a time limit <sup>11</sup> . After completion, students receive a score report with explanations and recommendations.

#### **13. Progress tracking & analytics**

14. A dashboard visualises each student's proficiency across topics, time spent practising, and number of skills mastered.
15. Trouble-spot identification groups concepts where students struggle, enabling targeted intervention, similar to IXL's Trouble Spots report <sup>4</sup> .
16. Parents and teachers can drill down to view practice sessions and question-level data <sup>17</sup> .

#### **17. Recommendations & adaptive pathways**

18. The system performs a diagnostic when students first use it, estimating working grade levels and recommending appropriate starting skills <sup>2</sup> .
19. As students practise, the platform recommends next skills and foundational topics to close gaps <sup>18</sup> .

#### **20. Gamification & engagement**

21. Award badges when students reach proficiency or mastery levels.
22. Simple leaderboards display top performers among siblings or class to encourage friendly competition, inspired by IXL's leaderboards <sup>9</sup> .

#### **23. Language support & accessibility**

24. Provide user interface and content in Thai and English.
25. Offer audio read-aloud options to support younger learners and those with reading difficulties.

## 26. Administration & content management

- 27. An admin interface enables educators to create and tag questions, author explanations and manage the question bank.
- 28. Administrators can manage user accounts, classes, and review usage analytics.

## Non-Functional Requirements

- **Platform:** The MVP should be a web-based responsive application that works on desktops, tablets and mobile phones.
- **Security & privacy:** The system must comply with Thailand's Personal Data Protection Act. Use secure authentication and store minimal personal data.
- **Performance:** Aim for low-latency question loading (< 1 s) and support for a small number of concurrent users.
- **Scalability:** Design database and application architecture to accommodate additional grades and subjects.
- **Localization:** Support Thai script and date/time formats; ensure fonts render correctly.

## Out-of-Scope for MVP

- Integration with external learning management systems (Google Classroom, Schoology).
- Advanced analytics at district or national level.
- Real-time collaborative features such as Group Jam and Live Classroom.
- Full alignment with all Thai textbooks (beyond initial topic coverage).
- Native mobile applications (the MVP will be web responsive).

## Risks & Mitigations

Risk	Mitigation
<b>Content development is time-consuming</b>	Start with a limited set of topics and expand gradually. Where possible, adapt open educational resources and involve Thai educators.
<b>Adaptive algorithm may be complex to implement</b>	Begin with a simple scoring system (SmartScore-like) and basic recommendations; refine algorithms using data from initial users.
<b>User engagement might decline</b>	Incorporate badges and leaderboards; involve parents in celebrating achievements and set realistic practice goals.
<b>Language translation issues</b>	Collaborate with native Thai educators to review translations and content.
<b>Data privacy compliance</b>	Consult legal guidelines for the Personal Data Protection Act and implement secure data practices.

## Milestones (Indicative)

1. **Requirements & Design (Weeks 1–2)** – Finalise PRD, define data models, design user flows and wireframes.
  2. **Infrastructure Setup (Weeks 2–3)** – Set up hosting, database and authentication infrastructure.
  3. **Content Creation (Weeks 2–6)** – Develop question bank and explanations for selected math and technology topics.
  4. **Practice Module Development (Weeks 3–6)** – Implement question rendering, scoring algorithm and immediate feedback.
  5. **Exam Generator Development (Weeks 4–7)** – Build the interface for generating practice exams, randomising questions and recording results.
  6. **Analytics & Dashboard (Weeks 6–8)** – Create progress tracking, trouble-spot identification and reporting features.
  7. **Testing & Iteration (Weeks 7–9)** – Conduct usability testing with children, parents and teachers; refine features based on feedback.
  8. **Launch MVP (Week 10)** – Deploy the application for initial users (e.g., the requester’s children), monitor usage and gather feedback.
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This PRD outlines a minimal yet powerful platform inspired by IXL. By focusing on adaptive practice, on-demand assessment, progress tracking and Thai curriculum alignment, the MVP can deliver personalized and engaging learning experiences for Thai Grade 4 and Grade 6 students.

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### 1 IXL - How it works

<https://www.ixl.com/membership/teachers/how-it-works>

### 2 3 18 The IXL Real-Time Diagnostic

<https://www.ixl.com/diagnostic>

### 4 17 IXL - Analytics information

<https://www.ixl.com/analytics>

### 5 IXL - Instructional resources & classroom tools

<https://www.ixl.com/membership/administrators/instruction-and-engagement>

### 6 7 8 9 16 5 cool and useful IXL features you may not know about - IXL Official Blog

<https://blog.ixl.com/2019/09/25/5-cool-and-useful-ixl-features-you-may-not-know-about/>

### 10 11 IXL Quizzes: Custom assessments in a snap - IXL Official Blog

<https://blog.ixl.com/2022/10/13/ixl-quizzes-custom-assessments-in-a-snap/>

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