EduConnect Technical Changes Documentation

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Purpose

This document summarizes the key technical changes made to EduConnect in response to poster presentation feedback. The main goal is to strengthen measurement integrity, accessibility, communication reliability, and persistent personalization for resource-constrained higher education contexts.

Summary of Key Technical Responses

1) Timer Accuracy and Study Session Tracking (Accepted)

Issue: The timer was counting idle and preparation time, inflating study metrics and weakening engagement analytics.
Change:

- Timer starts only after explicit *Start Studying*.

- Auto-pause after 5 minutes of inactivity.

- Log only active intervals (start/stop timestamps).

- Dashboard separates *Active Study Time* vs *Session Duration*.

- Resume sessions to avoid losing progress during short breaks.

Impact: More valid analytics and stronger trust in AI-generated insights.

2) Accessibility: Support for Blind and Low-Vision Users (Accepted)

Issue: No audio prompts or screen reader optimization limited accessibility.
Change:

- Add audio navigation for major flows (login, dashboard, resources, peer matching).

- Improve screen reader support using semantic HTML5 and ARIA labels.

- Strengthen keyboard navigation (focus control, skip-to-content links).

- Integrate text-to-speech for dynamic content narration (Web Speech API).

- Conduct accessibility testing using NVDA and JAWS.

Impact: Improves equitable access and supports ethical, inclusive adoption.

3) Feedback Delivery to Authenticated Email (Accepted)

Issue: Feedback could be sent to unverified or outdated email addresses, affecting privacy and reliability.
Change:

- Enforce email verification before account activation.

- Route all feedback only to the verified email stored in the user profile.

- Add email change workflow requiring re-verification.

- Implement delivery retries (3 attempts with backoff) and maintain audit logs.

Impact: Ensures secure, traceable communication and improves user confidence.

4) User Persistence and Personalized Dashboard (Accepted)

Issue: User data did not persist across sessions, preventing true personalization and long-term learning history.
Change:

- Introduce durable storage for users, learning profiles, interaction history, and feedback signals.

- Implement JWT authentication and session hydration on login.

- Use caching for frequently accessed user data to reduce database load.

- Redirect users to a personalized dashboard showing recommendations, peer matches, and progress insights.

Impact: Enables continuous learning experience, better recommendations, and longitudinal research viability.

5) Accessibility Gap: Deaf and Hard-of-Hearing Users (Partially Accepted)

Issue: Audio enhancements may not benefit deaf users and could create new barriers if audio becomes central.
Position: The limitation is acknowledged and documented, but full implementation is scheduled for Phase 2 due to current sprint constraints.
Mitigation:

- Establish rule: *no information will be communicated only through audio.*

- Add backlog items for captions, transcripts, and visual alternatives to audio cues.

- Communicate scope clearly to stakeholders and include diverse user testing.

Conclusion

The feedback integration strengthened EduConnect by improving timer validity, expanding accessibility for blind and low-vision students, ensuring feedback is delivered only to verified authenticated emails, and enabling persistent personalization through durable user storage. One accessibility limitation (support for deaf and hard-of-hearing users) is transparently documented with a Phase 2 roadmap, ensuring ethical scope management while maintaining the system's core goal of equitable, data-driven learning support.

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