

**BE-SELF: Мултиплатформен дигитален инструментариум
за оценяване и професионално развитие
на практиките за социално и емоционално учене (СЕУ) на учителите**
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**BE-SELF: A Cross-platform Digital Toolkit
for the Assessment and Professional Development
of Teachers' Social and Emotional Learning (SEL) Practices**
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Abstract:

Social and emotional learning (SEL) is a critical component of modern education, fostering students' self-awareness, self-management and interpersonal skills. Despite its importance, many educators experience a lack of specialized tools to integrate SEL into curricula. This paper presents the BE-SELF platform, a cross-platform application developed using the Flutter framework designed to support the professional development of elementary school teachers. Unlike generic tools, BE-SELF implements a sequential, four-module learning pathway integrated with robust accessibility features, including dyslexia-friendly typography (Lexend) and dynamic font scaling. We detail the platform's repository-based architecture, its multi-modal content delivery (text, video, PDF, and web links), and its integrated assessment system that tracks teacher progress from initial evaluation to multi-lingual certification.

Keywords: Social and emotional learning (SEL), teacher competency development, digital educational tools, Flutter, Firebase.

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INTRODUCTION

The integration of social and emotional learning (SEL) in the classroom is increasingly linked to improved mental health and academic success for students [4]. However, the transition from theoretical SEL concepts to classroom practice remains a challenge for many educators. Current professional development often lacks the scalability and personalization required to meet diverse teacher needs.

To address this gap, the BE-SELF project offers an innovative digital solution. This paper details the development of a toolkit that facilitates the assessment, monitoring, and enhancement of SEL practices, following established criteria for evidence-based programs [3]. The project's primary contribution is the digital operationalization of a multi-dimensional SEL framework, provided through a highly accessible, cross-platform interface.

The platform features a user-friendly interface for teachers to engage with educational content, track their progress against defined competencies, and perform self-assessments. On the administrative side, BE-SELF offers a robust set of tools for educators to create and manage courses, learning resources, and assessment criteria, allowing for a high degree of customization and adaptability to various curricula. By focusing on usability, inclusion, and cultural sensitivity, BE-SELF aims to advance open education practices and create more effective learning environments in schools.

1. Platform architecture and technical implementation

The BE-SELF platform is engineered as a cross-platform application to ensure broad accessibility across web, Android, and iOS devices [1]. It offers actionable, self-assessment and scenario-based feedback, enabling teachers to make informed adjustments to their strategies and better support their students' diverse needs. The architecture prioritizes scalability and a consistent user experience (UX) through modern, open-source technologies [2].

1.1. Backend infrastructure and data management

The application is built using *Flutter*, Google's UI toolkit, enabling a unified codebase for multiple platforms [7]. This significantly reduces maintenance overhead while ensuring native-level performance.

The platform's data persistence and security are managed through a deep integration with *Firebase* [5]. *Cloud Firestore* serves as the primary NoSQL database, enabling real-time synchronization of teacher progress and assessment data across all active clients. Secure user access is facilitated via *Firebase Authentication*, supporting both traditional email/password credentials and Google Sign-In [8], while *Firebase Storage* handles the management of high-capacity assets such as educational PDFs. This serverless architecture eliminates the need for manual server maintenance, allowing the project to scale seamlessly as the number of users grows.

1.2. Inclusive UI/UX and accessibility standards

The interface utilizes the *Material 3* design system, enhanced with the *Lexend* font family, which is specifically designed to reduce visual stress and improve reading performance for users with dyslexia. A minimum font size of 18 pixels is maintained to ensure legibility. As shown in Figure 1, the platform empowers users with agency over their viewing experience through a dynamic scaling system that can increase text size up to 1.5 times without breaking the layout.

All interactive elements (icons, buttons) include semantic labels for compatibility with screen readers. A responsive "hamburger" menu and dynamic app bar ensure the interface remains intuitive on devices ranging from mobile phones to high-resolution monitors. Furthermore, the integration of *flutter_localizations* and *intl* packages provides native-level support for English, Bulgarian, Hungarian, and Portuguese, while comprehensive semantic labeling ensures the platform is fully navigable for visually impaired educators using screen readers.

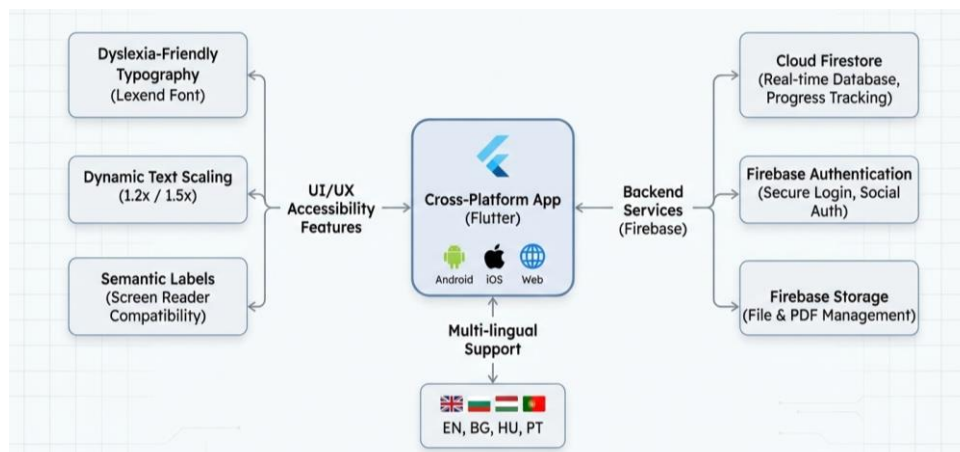


Fig. 1. The BE-SELF platform technical and accessibility ecosystem.

1.3. Content authoring and resource management

The BE-SELF platform (<https://beself.nbu.bg>) is designed to move beyond static text by providing a robust, multi-modal authoring environment. At the core of its content creation suite is the *flutter_quill* rich text editor, which provides educators with an intuitive interface for formatting instructional materials, managing lists, and applying inline styling similar to a standard word processor [6]. This allows for the creation of high-quality, structured textual resources that are directly integrated into the application's sequential modules.

To support diverse learning preferences and complex subject matter, the platform facilitates the integration of various media types. Educators can embed external web resources and hyperlinked materials, ensuring that training content remains connected to broader academic and professional networks. Furthermore, the system leverages *Firebase Cloud Storage* to host and serve high-capacity assets such as PDF worksheets and research papers [5], which users can access and download natively within the app. Video content, specifically from platforms like YouTube, is also supported through direct embedding into lesson pages.

This high degree of technical customization ensures that the learning environment is not only dynamic and engaging but also easily adaptable to a wide range of curricula and specific teacher requirements.

1.4. State management and application structure

To handle application state in a clean and predictable way, the platform employs a combination of *flutter_bloc* and *provider* packages for state management [1]. A prime example is the *AppLanguageProvider*, a *ChangeNotifier* that manages the application's locale and text scaling factor globally. This state is then consumed by widgets throughout the application, allowing them to rebuild automatically when the language or accessibility settings change.

The project follows a well-defined structure, separating concerns into distinct directories for views (screens), widgets (reusable UI components), services (business logic), and repository layers [6]. This modular approach enhances code readability and maintainability.

2. The structured learning journey

The pedagogical core of the platform is organized into a sequential, multi-stage workflow designed to ensure mastery of SEL concepts while maintaining educational integrity. As illustrated in Figure 2, the curriculum follows a linear progression system that begins with informed consent and a baseline assessment (Evaluation 1). To ensure that foundational knowledge is solidified before advancing, the platform implements a sequential unlocking mechanism; modules 2 through 4 remain inaccessible until the user successfully completes the preceding sections. Throughout this journey, the system provides real-time progress tracking, allowing educators to monitor their completion percentages dynamically.

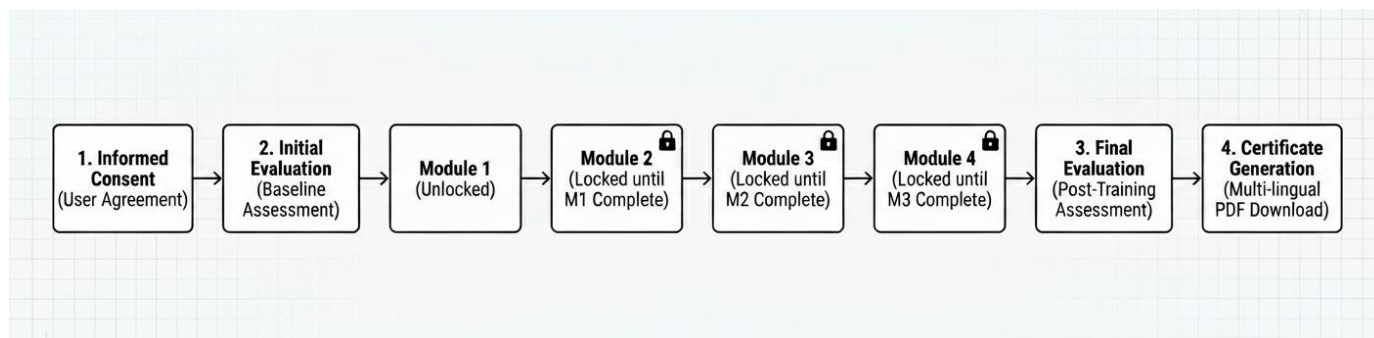


Fig. 2. The sequential user workflow.

To accommodate diverse learning preferences and enhance engagement, each module utilizes multi-modal content delivery. This includes formatted rich text powered by the *flutter_quill* editor, integrated media such as YouTube videos and PDF documents, and curated external web resources. Interactivity is further reinforced through self-assessment quizzes and practical self-learning scenarios. Each module has integrated self-assessment tests, the successful completion of which automatically contributes to increasing the overall progress of the module.

3. Administrative oversight and evaluation

The BE-SELF platform employs a dual-interface system that facilitates robust data collection and granular user management. The evaluation framework is central to measuring the platform's impact, utilizing initial and final assessments composed of six distinct question types—ranging from Likert-style ratings to open-ended text fields. This comprehensive data structure allows researchers to quantify changes in teacher attitudes and SEL knowledge effectively.

The administrative dashboard provides coordinators with high-level control over the ecosystem, including the ability to manage user access, monitor individual progress, and dynamically update module content. A critical feature for research efficiency is the automated data export functionality, which generates Excel (.xlsx) reports for both user demographics and evaluation results, enabling immediate statistical analysis. The professional development cycle concludes with the generation of a personalized, multi-lingual PDF certificate. Supporting English, Bulgarian, Hungarian, and Portuguese, the system automatically pre-fills certification data from the secure cloud database, providing educators with formal recognition of their completed training.

CONCLUSION

The BE-SELF project represents a significant step in leveraging digital innovation for teacher education. By combining a robust technical stack with a structured pedagogical framework, the platform provides a scalable, personalized solution for SEL development. Future validation will contribute not only to the platform's refinement but also to the broader scientific understanding of how digital tools can foster emotionally aware learning environments.

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