TECHNOLOGIES FOR DESIGNING EDUCATIONAL OBJECTIVES

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Abstract: *This study examines contemporary technologies for designing educational objectives within the framework of competence-based curriculum reform in the Republic of Uzbekistan. Drawing on a mixed-methods design conducted with 72 in-service teachers enrolled in advanced professional development courses at the Abdulla Avloniy National Institute of Pedagogical Excellence during the 2024–2025 academic year, the research evaluates the impact of a structured intervention based on three design technologies: Bloom's revised taxonomy, the SMART criteria, and backward design. A control group continued with intuitive lesson planning, while the experimental group received twenty-four hours of guided instruction in objective-design technologies. Pre- and post-intervention assessments of lesson plans demonstrate a statistically meaningful improvement of 28.6% in the experimental group, accompanied by stronger alignment between stated objectives, classroom activities, and assessment instruments. Qualitative data from teacher reflections confirm increased confidence, clearer planning logic, and a measurable shift from content-centred to outcome-centred thinking. The paper offers practical recommendations for institutes of pedagogical excellence and curriculum designers.*

Keywords: *educational objectives, instructional design, Bloom's taxonomy, SMART criteria, backward design, competence-based education, teacher professional development, Uzbekistan.*

1. Introduction

The quality of any educational process depends, before anything else, on the quality of the objectives that frame it. An objective that is vaguely formulated, disconnected from assessment, or pitched at a single cognitive level cannot guide either teaching or learning effectively. In recent years, the Republic of Uzbekistan has launched an ambitious reform of general and higher education aimed at transitioning from a content-oriented model to a competence-oriented one. Documents such as the Presidential Decree on the Development Strategy of New Uzbekistan and the National Programme for the Development of Public Education place explicit emphasis on measurable learning outcomes and on the professional capacity of teachers to design them.

Within this reform agenda, the design of educational objectives is no longer treated as a routine clerical step. It is recognised as a specialised pedagogical technology requiring theoretical grounding, procedural skill, and reflective judgement. International literature

offers a robust toolkit — Bloom's revised taxonomy, the SMART criteria, backward design, and competence matrices — yet empirical evidence on how Uzbek teachers internalise and apply these tools remains scarce.

The present study addresses this gap. It investigates the following research questions:

(1) To what extent does a structured intervention in objective-design technologies improve the quality of lesson objectives produced by in-service teachers?

(2) How does such an intervention affect the alignment between objectives, learning activities, and assessment within teachers' lesson plans?

(3) How do participants themselves perceive the practical value of the technologies introduced?

The aim of the paper is therefore to provide both quantitative evidence of effectiveness and a qualitative account of how Uzbek teachers experience the transition from intuitive to technology-based objective design.

2. Methods

2.1 Participants and Setting

The investigation was carried out at the Abdulla Avloniy National Institute of Pedagogical Excellence between October 2024 and March 2025. A total of 72 in-service teachers from secondary schools across five regions of Uzbekistan, with five to fifteen years of experience, participated in the study. Participants were randomly assigned to either the control group (n = 36) or the experimental group (n = 36). Background variables — subject specialism, years of service, and prior exposure to instructional design — were checked for equivalence and no significant differences were detected.

2.2 Research Design

A quasi-experimental mixed-methods design was adopted. The quantitative strand relied on pre- and post-intervention evaluation of lesson plans, each scored on a 100-point rubric measuring three dimensions: the quality of the objectives, alignment between objectives and activities, and alignment between objectives and assessment. The qualitative strand drew on reflective journals kept by experimental participants and on a semi-structured end-of-course questionnaire. The control group continued with intuition-based planning, while the experimental group received twenty-four hours of guided instruction in objective-design technologies.

2.3 The Intervention

The experimental group's instruction was organised around three interlocking technologies. First, Bloom's revised taxonomy was introduced as a vertical framework helping teachers move beyond remembering and understanding toward analysing, evaluating, and creating. Second, the SMART criteria — specific, measurable, achievable, relevant, time-bound — were applied as a horizontal quality filter for every objective. Third, backward design served as the macro-procedure, requiring teachers to specify desired outcomes first,

assessment evidence next, and instructional activities last. Each technology was modelled by the trainer, practised in small groups using authentic subject content, and applied individually to a full lesson plan submitted for feedback.

2.4 Instruments and Data Analysis

The rubric was developed with two senior methodologists of the Institute and piloted on twelve plans excluded from the main sample. Inter-rater reliability between two independent assessors was acceptable (Cohen's $\kappa = 0.84$). Mean scores, standard deviations, and a paired-samples t-test were computed in IBM SPSS 26. Qualitative data were analysed thematically following Braun and Clarke's six-phase procedure, with two coders cross-checking emerging categories until full agreement was reached.

3. Results

3.1 Quantitative Findings

The two groups began at a comparable level, with average pre-intervention scores of 54.7 (control) and 55.3 (experimental) out of 100. By the end of the intervention the gap had widened considerably. The control group improved by 6.8 points to 61.5, whereas the experimental group improved by 28.6 points to 83.9. The paired-samples t-test confirmed that the post-intervention difference was statistically significant ($t = 7.92$, $p < 0.001$). Table 1 summarises the principal outcomes.

Table 1. Pre- and post-intervention mean scores by group (max = 100)

Group	Pre-test M	Post-test M	Gain	SD
Control (n = 36)	54.7	61.5	+6.8	5.4
Experimental (n = 36)	55.3	83.9	+28.6	6.2

Disaggregating the rubric reveals an instructive pattern. The most pronounced gains in the experimental group concerned alignment between objectives and assessment (+34 points) and the cognitive range of objectives across Bloom's levels (+31 points). Activity-objective alignment improved more moderately (+21 points), suggesting that procedural changes in classroom practice require additional time to consolidate. Table 2 illustrates the distribution of objective verbs across Bloom's levels before and after the intervention.

Table 2. Distribution of objective verbs across Bloom's levels (experimental group, %)

Cognitive level	Pre	Post
Remember / Understand	68%	29%

Cognitive level	Pre	Post
Apply	21%	27%
Analyse	8%	21%
Evaluate / Create	3%	23%

3.2 Qualitative Findings

Three recurring themes emerged from the reflective journals and questionnaire responses. First, participants reported a marked shift from a content-centred to an outcome-centred mindset: many had previously begun preparation by listing topics and only later formulated an objective, but after the intervention they reversed this sequence and treated the objective as the architectural foundation of the lesson. Second, the SMART criteria were appreciated as a rapid diagnostic tool for spotting vague or unmeasurable objectives. Third, backward design was perceived as initially demanding but ultimately liberating, since it eliminated activities that did not lead anywhere measurable.

4. Discussion

The findings support the central premise of modern instructional design: the quality of educational objectives strongly predicts the quality of the entire teaching cycle. The 28.6-point gain in the experimental group is consistent with international research reporting medium-to-large effect sizes for structured interventions in teacher development. The disproportionate improvement in alignment with assessment is particularly noteworthy, as it confirms the diagnostic value of backward design for closing the gap between intended and assessed learning.

Several pedagogical implications follow. The design of educational objectives should be treated as a stand-alone competence in teacher education programmes rather than as an implicit by-product of subject-methodology courses. Moreover, the three technologies examined are not competing alternatives but complementary layers: taxonomy ensures cognitive range, SMART ensures measurability, and backward design ensures structural coherence. Institutes of pedagogical excellence are therefore well positioned to integrate the three into a single, sequenced training module.

Three limitations should be acknowledged. The sample, though drawn from five regions, was restricted to teachers enrolled in a single institute, which constrains generalisability. The intervention lasted one semester, leaving long-term retention unexamined. Finally, although inter-rater reliability was high, all assessors were familiar with the institute's training culture, which may have introduced an implicit bias. Future research could replicate the design across other regional centres and add delayed post-tests.

5. Conclusion

This study has shown that the systematic integration of three objective-design technologies — Bloom's revised taxonomy, the SMART criteria, and backward design — produces a substantial improvement in the quality of lesson objectives written by Uzbek in-service teachers, together with stronger alignment among objectives, activities, and assessment. The findings suggest that institutes of pedagogical excellence in Uzbekistan can move beyond intuitive planning traditions when the technologies are introduced in a sequenced, hands-on manner with ongoing feedback. More broadly, the study contributes to the country's competence-based reform by offering empirical evidence that the technology of designing educational objectives is both teachable and consequential, and could profitably anchor every professional development course at the Abdulla Avloniy National Institute and beyond.

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