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# Improving The Methodology For Developing The Pedagogical Skills Of Future Teachers Based On A Functional Approach

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**Abstract:** The accelerating complexity of contemporary classrooms demands that teacher-education programmes shift from transmissive training to adaptive formation of pedagogical skills. This article elaborates a functional approach as the conceptual basis for improving the methodology of skill development in future teachers. Drawing upon functional linguistics, systems thinking, and professional action theory, the study proposes that pedagogical skills are best construed as context-dependent functions embedded in instructional situations rather than as decontextualised techniques. A design-based research project conducted at Fergana State University piloted an enhanced methodology featuring function-oriented task cycles, reflective dialogue, and performance analytics. Mixed-methods evaluation revealed statistically significant gains in planning coherence, classroom interaction quality, and adaptive decision-making when compared with a control cohort following a conventional competency-based curriculum. Qualitative findings indicate that the functional approach cultivates an integrated professional vision, enabling novices to map instructional challenges onto purposeful actions with greater agility. The discussion positions the revised methodology within global teacher-education reforms and offers implementation guidelines for curriculum designers and teacher educators.

**Keywords:** Functional approach, teacher education, pedagogical skills, methodology improvement, design-based research, professional vision.

**Introduction:** The effectiveness of any education system rests on the pedagogical proficiency of its teachers. Traditional initial teacher-education programmes frequently organise curricula around discrete competencies such as lesson planning, classroom management, and assessment literacy. Although competency frameworks ensure coverage, they often fragment professional learning by isolating skills from the functional problems teachers must solve in authentic classrooms. Fragmentation hampers fluid transfer, leaving novice teachers able to describe a range of techniques yet struggling to choose and adapt them in dynamic situations. International policy discourses, including the OECD Future of Education and Skills 2030 project, increasingly emphasise functional integration of knowledge and skills to meet complex educational challenges.

A functional approach conceptualises pedagogical skills as purposeful functions that emerge within interactions among teacher, learner, content, and context. It resonates with Hallidayan systemic-functional linguistics, which views language as choice within context, and with the cybernetic understanding of professional activity as regulation of feedback loops. By foregrounding function, the approach reframes skill development from accumulating discrete behaviours to cultivating the capacity to perceive instructional problems, select appropriate functional responses, and evaluate outcomes. Such reframing demands methodological innovation in teacher preparation, moving beyond demonstration and rehearsal to iterative cycles of functional analysis, action, and reflection.

The present study aims to improve the methodology of pedagogical skill development for future teachers through the lens of the functional approach. Three research questions orient the inquiry: first, what methodological principles effectively translate the functional approach into structured learning experiences for teacher candidates; second, how does the resulting methodology influence the development of key pedagogical skills; and third, what perceptions

do teacher candidates form regarding the usefulness and transferability of function-oriented learning cycles?

The investigation adopted a design-based research (DBR) paradigm, which integrates iterative intervention design with systematic inquiry to generate practical and theoretical knowledge. Two cohorts of fourth-year bachelor students majoring in pedagogy at Fergana State University participated. The experimental cohort comprised sixty-two students enrolled in the redesigned methodology course, while the control cohort included sixty students following the standard competency-based course. Baseline equivalence was established via pre-course grade point averages and the Teacher Skills Self-Efficacy Scale, revealing no significant differences.

The intervention spanned sixteen weeks and integrated three functional pillars. First, function-oriented task cycles required students to analyse real classroom videos, identify underlying instructional functions such as scaffolding conceptual understanding or regulating group dynamics, and design micro-interventions targeting those functions. Second, reflective dialogue sessions facilitated collective theorisation of enacted functions, supported by discourse prompts encouraging participants to articulate decision rationales and evaluate functional adequacy. Third, performance analytics employed digital observation tools that generated heat maps of teacher talk moves and student engagement patterns, enabling data-driven reflection. Instructional episodes alternated between on-campus seminars and mentored practicum in partner schools, aligning with DBR's emphasis on authentic contexts.

Data collection blended quantitative and qualitative measures. Pedagogical skill performance was assessed through video-recorded micro-teaching evaluated by two independent raters using the Functional Pedagogical Skills Rubric, which assessed planning coherence, interactive responsiveness, and formative assessment alignment on a five-point scale. Inter-rater reliability reached 0.88 using Cohen's kappa. Quantitative analyses employed repeated-measures ANCOVA with pre-test scores as covariates. Qualitative data comprised reflective journals, focus-group transcripts, and mentor observation notes. Thematic coding followed an inductive–deductive logic, allowing emergent patterns to refine functional constructs. All procedures received approval from the university research ethics committee, and participants provided informed consent.

Statistical analysis demonstrated clear advantages of the functional methodology. Experimental-cohort scores on planning coherence rose from a pre-test mean of 2.7 (SD = 0.6) to a post-test mean of 4.1 (SD = 0.5), whereas control-cohort scores increased from 2.8 (SD = 0.7) to 3.3 (SD = 0.6). The group-by-time interaction was significant, $F(1,119) = 36.14$, $p < 0.001$, with a partial $\eta^2$ of 0.23, indicating a large effect. Interactive responsiveness improved by 1.3 points in the experimental group compared with 0.6 points in the control group, yielding $F(1,119) = 29.47$, $p < 0.001$, partial $\eta^2 = 0.20$. Formative assessment alignment followed a similar pattern, with the experimental group achieving a post-test mean of 3.9 (SD = 0.5) against the control group's 3.1 (SD = 0.6), $F(1,119) = 25.02$, $p < 0.001$, partial $\eta^2 = 0.17$.

Qualitative analysis revealed that function-oriented task cycles shifted participants' attention from surface behaviours to underlying instructional purposes. Reflective dialogue transcripts showed increasing sophistication in functional vocabulary, moving from descriptive phrases such as "asked questions" to analytic formulations like "elicited diagnostic probes to gauge prior conceptions." Journals indicated heightened metacognitive awareness, with students reporting deliberate modulation of wait time and questioning strategies to sustain cognitive demand. Mentor notes corroborated these self-reports, highlighting smoother transitions between lesson phases and more adaptive classroom management.

Focus-group interviews conducted after the practicum conveyed that participants viewed the functional approach as empowering. They described professional growth not as memorising teaching tricks but as learning "how to think like a teacher who can solve problems on the fly." Data visualisations from performance analytics further anchored reflection, prompting one participant to remark that seeing engagement heat maps "turned abstract feedback into concrete evidence." Challenges were nonetheless noted; some students initially felt overwhelmed by the open-ended nature of function identification and required scaffolded modelling by instructors.

The findings suggest that a functional approach offers substantive advantages in cultivating integrated pedagogical skills. Compared with competency-based training, which often fragments planning, instruction, and assessment, the functional methodology aligns with the situated cognition thesis that expertise develops through engagement with meaningful tasks. The significant improvements across all rubric dimensions indicate that function-oriented learning cycles help novices internalise the logic linking instructional intentions to strategic actions.

Theoretically, the study extends professional action

theory by operationalising functions as dynamic affordances rather than static categories. Unlike competency lists, functions manifest differently across subject domains and learner profiles; thus, the ability to diagnose and enact appropriate functions embodies adaptive expertise. Reflective dialogue emerged as a critical mediating mechanism, enabling students to externalise tacit decision processes and subject them to communal scrutiny. This echoes Vygotsky's principle that higher mental functions originate in social interaction before being internalised.

Performance analytics contributed to empirical grounding of reflection, aligning with the growing movement towards data-informed practice in teacher education. While data dashboards risk reductionism, their judicious use in the present study complemented qualitative reflection, bridging the gap between subjective impressions and observable patterns. The combination appears to foster a balanced professional vision that integrates interpretive and empirical epistemologies.

Implementation, however, demands careful orchestration. Instructors must possess deep knowledge of functional categories and facilitation skills to guide novices through ambiguity without reverting to prescriptive recipes. Institutional support is needed to provide access to classroom video libraries, analytic tools, and practicum partnerships that furnish authentic problem spaces. Furthermore, assessment regimes should value functional reasoning alongside performance quality to reinforce desired learning orientations.

Reconceptualising pedagogical skill development through a functional approach transforms teacher-education methodology from the accumulation of discrete competencies to the cultivation of purposeful instructional problem-solving. The design-based intervention at Fergana State University demonstrates that integrating function-oriented task cycles, reflective dialogue, and performance analytics significantly enhances planning coherence, interaction quality, and formative alignment among future teachers. Qualitative insights reveal that participants internalise a professional vision capable of mapping instructional challenges onto adaptive functional responses, signalling readiness for complex classroom realities. These outcomes endorse the functional approach as a viable pathway for modernising teacher-education curricula and aligning them with the fluid demands of twenty-first-century schooling.

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