BG Pulse Journal USA
ISSN:1947-2536 http://www.bgpulseusa.com/index.php/bg

SCIENTIFIC AND METHODOLOGICAL FOUNDATIONS FOR INTEGRATING THE ICAP MODEL INTO THE PREPARATION OF PRE-SERVICE PRIMARY SCHOOL TEACHERS TO TEACH THE SUBJECT "TARBIYA"

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Doi: https://doi.org/10.5281/zenodo.24269906

Abstract. This article examines the scientific and methodological foundations of integrating the ICAP (Interactive, Constructive, Active, Passive) model into the preparation of pre-service primary school teachers to teach the subject "Tarbiya". Drawing on the theoretical principles of cognitive engagement and student-centered learning, the study explores how ICAP-based instructional approaches can support the development of pedagogical competencies essential for teaching "Tarbiya". Particular emphasis is placed on aligning different modes of cognitive engagement with instructional strategies that promote critical thinking, reflective practice, collaborative learning, and moral development. The article proposes a conceptual approach to incorporating the ICAP framework into teacher education and discusses its implications for enhancing the professional readiness of future primary school teachers.

Keywords: ICAP model, Tarbiya, pre-service primary school teachers, cognitive engagement, teacher education, pedagogical competence, instructional strategies.

1. INTRODUCTION

Preparing pre-service teachers for professional practice requires establishing a meaningful connection between pedagogical theory and its application in classroom settings. Knowledge of instructional methods or educational models does not necessarily ensure their effective implementation in accordance with subject content, learning objectives, and pupils' developmental characteristics. Therefore, teacher education must facilitate the transformation of theoretical knowledge into instructional design, learning tasks, and evidence-informed pedagogical decisions. This challenge is particularly relevant to preparing prospective primary school teachers to teach "Tarbiya", a subject addressing moral values, interpersonal relationships, social responsibility, and personal development within Uzbekistan's education system.

Teaching "Tarbiya" requires more than the transmission of moral concepts and social norms. Pupils must be encouraged to analyze real-life situations, justify their opinions, consider alternative perspectives, and collaboratively develop solutions. Consequently, prospective teachers need to design learning activities that promote meaningful cognitive engagement rather than merely observable participation.

The theoretical foundations of student engagement have been extensively examined in educational research. Fredricks, Blumenfeld, and Paris (2004) conceptualized engagement through behavioral, emotional, and cognitive dimensions, emphasizing that observable participation does not necessarily reflect the depth of students' cognitive processing [1]. Building on this perspective, Chi (2009) distinguished active, constructive, and interactive learning activities [2]. Chi and Wylie (2014) subsequently formalized the ICAP framework, which identifies four modes of cognitive engagement: Passive, Active, Constructive, and Interactive [3].

The ICAP framework proposes that learning outcomes generally improve as engagement progresses from passive and active participation toward constructive and interactive knowledge-building, provided that appropriate instructional conditions are established. Constructive engagement involves generating explanations, inferences, or solutions beyond the information provided, whereas interactive engagement requires learners to build upon, challenge, and refine one another's contributions. Thus, group work or classroom discussion does not automatically constitute interactive cognitive engagement.

Empirical research has demonstrated challenges in translating ICAP principles into classroom practice. Chi et al. (2018) identified discrepancies between teachers' understanding of the framework, instructional planning, classroom implementation, and students' actual learning activities [4]. Similarly, Vosniadou et al. (2023), examining the lessons of 20 teachers through ICAP-based coding, classified only 30% of observed learning tasks as constructive or interactive [5]. These findings highlight the importance of preparing teachers to distinguish between the organizational format of learning activities and their underlying cognitive demands.

Reflective practice provides an additional foundation for connecting pedagogical knowledge with instructional decisions. Korthagen (2004) emphasized the interrelationships among teachers' professional actions, beliefs, identity, and reflection [6]. From this perspective, teacher preparation should involve not only instructional planning but also the systematic evaluation and refinement of pedagogical decisions based on evidence of student learning.

Within the context of "Tarbiya" education, Farsakhonova examined the methodological potential of innovative learning environments, interactive methods, problem-based learning, and collaborative instruction in preparing prospective teachers [7]. Related studies explored the educational value of game-based technologies in primary education [8] and the relevance of international approaches to improving educational practices related to moral and social development [9].

Although these studies provide complementary theoretical and methodological perspectives, their integration remains insufficiently specified in the literature reviewed. ICAP research offers criteria for identifying and analyzing cognitive engagement, while studies on teaching "Tarbiya" emphasize subject-specific instructional approaches. However, a coherent mechanism connecting ICAP-based cognitive engagement, instructional task design, microteaching, and reflective evaluation in the preparation of prospective primary school teachers requires further conceptual development.

This study addresses the gap between pre-service teachers' theoretical understanding of ICAP engagement modes and their ability to apply these principles when designing and implementing "Tarbiya" lessons. Specifically, it focuses on adapting ICAP modes to subject-specific learning objectives, translating theoretical principles into instructional tasks, and refining lesson designs through reflection on observable evidence of learning.

The aim of this study is to develop the theoretical and methodological foundations for integrating the ICAP model into the preparation of pre-service primary school teachers to teach "Tarbiya" and to conceptually substantiate a mechanism linking theoretical knowledge, instructional design, microteaching, and reflective improvement.

The study addresses three research questions:

1. How can the cognitive engagement modes of the ICAP framework be adapted to the values-oriented and activity-based content of "Tarbiya"?

2. What stages and interrelationships constitute a methodological mechanism for translating pre-service teachers' theoretical understanding of ICAP into lesson design, microteaching, and reflective instructional improvement?
3. Which observable indicators and performance-based evidence can be used to assess pre-service teachers' readiness to design ICAP-informed lessons and evaluate the quality of their instructional plans?

2. METHODS

This study employed a theoretical–conceptual research design to examine the integration of the ICAP framework into the preparation of pre-service primary school teachers to teach "Tarbiya". The research focused on adapting ICAP principles to subject-specific instructional objectives and developing a methodological mechanism linking theoretical knowledge, lesson design, microteaching, and reflective practice. The methods included conceptual and comparative–synthetic analysis, theoretical synthesis, structural–functional modeling, and operationalization.

Relevant literature was purposively selected from three interconnected areas: the theoretical foundations of ICAP and cognitive engagement, professional teacher preparation, and the content and instructional characteristics of "Tarbiya". Sources were examined for their relevance to conceptual framework development rather than through a systematic review or meta-analysis. The analysis focused on identifying cognitive engagement modes, explaining instructional design decisions, adapting theoretical principles to values-oriented learning, and determining observable indicators of pedagogical performance. Established theoretical constructs were distinguished from the methodological components proposed in this study.

The conceptual model was developed through successive stages. First, the distinguishing characteristics of the four ICAP engagement modes were identified and analyzed. Second, these characteristics were aligned with "Tarbiya"-specific learning activities, including moral dilemma analysis, justification of personal viewpoints, comparison of alternative perspectives, and collaborative problem-solving. Third, functional relationships were established among theoretical understanding, ICAP-informed lesson design, microteaching implementation, reflective evaluation, and instructional redesign.

Operationalization involved translating the model's conceptual components into observable performance indicators. These included the ability to distinguish ICAP modes, design cognitively appropriate learning tasks, justify instructional decisions, and revise lesson plans based on microteaching evidence. Corresponding performance-based evidence was specified to support future assessment.

The model's internal conceptual coherence was examined by assessing the alignment among theoretical constructs, proposed instructional activities, and expected pedagogical outputs. As this study was limited to conceptual development, neither the model's empirical validity and effectiveness nor the reliability of the proposed assessment indicators was tested. These aspects require further empirical investigation.

3. RESULTS

The theoretical analysis and conceptual modeling resulted in a subject-specific adaptation of the ICAP framework, a definition of pre-service teachers' methodological readiness, and a proposed mechanism for developing and assessing their ability to design "Tarbiya" lessons. These interconnected outcomes are presented below.

Adapting the ICAP Framework to "Tarbiya" Education

The ICAP framework was adapted to the content and instructional objectives of "Tarbiya" to distinguish learning activities according to their cognitive demands. The four engagement modes were interpreted as follows:

- **Passive (P):** Pupils receive information by listening to moral stories, observing illustrations, or becoming familiar with descriptions of social situations. Such activities provide a foundation for subsequent learning but do not necessarily involve generating new knowledge.
- **Active (A):** Pupils manipulate provided information by identifying, selecting, organizing, or matching existing elements. Their engagement remains primarily within the boundaries of the presented material.
- **Constructive (C):** Pupils generate explanations, conclusions, or solutions that extend beyond the information provided. In "Tarbiya" lessons, this may involve explaining the causes of a moral dilemma, justifying a decision, or proposing alternative actions.
- **Interactive (I):** Pupils collaboratively develop understanding by building on, questioning, or refining one another's ideas. Meaningful interaction requires reciprocal contributions that advance shared reasoning rather than simple agreement.

The distinction between these modes depends on pupils' observable cognitive activities and the knowledge they generate, rather than the organizational format of instruction. Group work, for example, cannot automatically be classified as interactive engagement. Moreover, cognitive engagement and the moral appropriateness of pupils' judgments represent distinct but related dimensions that require separate consideration.

Conceptualizing Methodological Readiness

In this study, methodological readiness for ICAP-informed "Tarbiya" instruction is defined as the professional capacity to distinguish cognitive engagement modes, design corresponding learning tasks, interpret evidence of pupils' engagement, and improve instructional plans accordingly.

This readiness encompasses four interrelated competencies: identifying engagement modes, designing cognitively appropriate tasks, analyzing learning activities, and revising instructional decisions. Its central principle is the alignment of instructional objectives, cognitive task demands, and pupils' actual learning activities.

A Methodological Transfer Mechanism

The principal conceptual outcome is a methodological transfer mechanism connecting two levels of teacher preparation. The first concerns university-based learning, where pre-service teachers acquire ICAP knowledge, analyze instructional examples, and design subject-specific tasks. The second involves applying these tasks in primary education, observing pupils' cognitive engagement, and evaluating instructional decisions. Microteaching serves as an intermediate practice environment, although its outcomes cannot be equated with those obtained in authentic primary school classrooms.

The proposed mechanism comprises four interconnected stages:

1. **Theoretical understanding:** Pre-service teachers examine the defining characteristics of ICAP modes and classify instructional activities using explicit evidence.
2. **Instructional design:** They develop "Tarbiya" learning tasks aligned with specific objectives, anticipated cognitive processes, and observable learning outcomes.
3. **Practical implementation:** Designed tasks are tested through microteaching and subsequently applied during teaching practice. Intended engagement modes are compared with observed learning activities.

4. **Reflective redesign:** Observation records, learner responses, and task outcomes are analyzed to identify limitations and refine instructional questions, guidance, and collaborative conditions.

These stages form a feedback-oriented process in which practical observations inform instructional revisions and, where necessary, further conceptual understanding. The essential distinction is between the engagement mode intended by the teacher and the cognitive activity actually demonstrated by learners.

Illustrative Application to "Tarbiya" Lessons

The proposed mechanism can be illustrated through the topic "Mutual Respect and Responsibility". In a hypothetical classroom situation, pupils struggle to distribute responsibilities during a group assignment, resulting in unequal participation.

Table 1. Illustrative ICAP-Based Learning Tasks for "Tarbiya"

ICAP mode	Illustrative learning task	Observable engagement
Passive	Listen to a short story or observe an illustration depicting unequal task distribution.	Receiving information about the situation.
Active	Identify actions explicitly described in the story and match prepared cards to the characters.	Selecting and organizing provided information.
Constructive	Propose a fair distribution of responsibilities and explain the reasoning behind the proposed solution.	Generating and justifying a new solution.
Interactive	Evaluate a partner's proposal, provide reasoned feedback, and collaboratively develop a revised solution.	Building shared understanding through reciprocal reasoning.

In interactive tasks, the process through which a shared solution emerges is as important as the final response. Revising an initial proposal in response to a partner's argument provides stronger evidence of interactive engagement than simply agreeing with another pupil.

These examples are illustrative instructional designs rather than empirically observed outcomes. Furthermore, the ICAP framework does not require lessons to follow a fixed Passive–Active–Constructive–Interactive sequence; engagement modes should be selected according to instructional objectives and task requirements.

Proposed Indicators for Assessing Methodological Readiness

Five assessment indicators were identified to support the future empirical evaluation of pre-service teachers' methodological readiness.

Table 2. Proposed Indicators and Evidence of ICAP-Based Methodological Readiness

Assessment indicator	Observable professional performance	Proposed evidence
Accuracy of ICAP classification	Correctly identifies engagement modes and justifies classifications using relevant characteristics.	Annotated classifications and lesson analyses.
Alignment of objectives and tasks	Connects learning objectives, pupils' developmental characteristics, and cognitive task demands.	Lesson plans and methodological justifications.
Quality of instructional task design	Develops tasks requiring independent explanation or collaborative knowledge construction.	Task descriptions, guiding questions, and anticipated responses.

Evidence-based analysis of learning activities	Compares intended engagement with observed learner behavior and supports conclusions with evidence.	Observation records and analyses of learner responses.
Justified instructional improvement	Revises lesson designs in response to identified problems and explains the rationale for modifications.	Original and revised lesson plans with reflective explanations.

These indicators connect conceptual understanding, instructional design, and reflective practice within a common assessment framework. They may subsequently be developed into an analytical rubric with explicit performance levels and scoring criteria.

At this stage, however, the indicators remain conceptual proposals. Their construct validity, inter-rater reliability, and practical applicability require empirical examination before they can be used as validated assessment instruments.

4. DISCUSSION

The proposed conceptual mechanism provides a framework for connecting ICAP principles with the subject-specific methodological preparation of pre-service primary school teachers. While Chi and Wylie (2014) developed the ICAP framework to explain differences in cognitive engagement and their implications for learning [3], the present study extends its application to designing, observing, and refining instructional activities in “Tarbiya” education.

This approach addresses challenges identified by Chi et al. (2018), particularly the difficulties teachers encounter when designing and implementing constructive and interactive learning activities [4]. By integrating theoretical understanding, instructional design, microteaching, and reflective redesign, the proposed mechanism establishes a structured connection between pedagogical knowledge and instructional practice. However, its effectiveness in addressing these challenges remains to be empirically established.

The main conceptual contribution of this study lies in framing the transition from theoretical knowledge to evidence-informed instructional decision-making as an iterative process. Lesson plans are viewed not as final products but as instructional designs that can be refined through observation and reflection. Differences between intended cognitive engagement and learners’ actual activities therefore become important sources of evidence for improving pedagogical decisions.

Adapting ICAP to “Tarbiya” also requires distinguishing cognitive engagement from moral development. Although these dimensions may be related, they should not be treated as equivalent. A pupil’s ability to justify a moral decision, compare alternative perspectives, or collaboratively develop a solution provides evidence of reasoning but does not necessarily demonstrate corresponding behavior in everyday life. Assessing moral attitudes and behavioral development requires additional evidence gathered across contexts and over time. Consequently, conclusions about moral development cannot be inferred directly from cognitive engagement indicators.

Previous studies by Farsakhonova on preparing teachers for “Tarbiya” instruction, game-based learning, and international educational practices [7–9] provide a subject-specific foundation for this adaptation. Integrating these pedagogical approaches with ICAP criteria shifts attention from the organizational format of activities to the cognitive contributions expected from learners. For example, the educational value of a collaborative task can be examined through opportunities for generating explanations, responding to others’ arguments, and revising initial judgments.

The proposed mechanism can also be interpreted through four interconnected dimensions of methodological competence. The **motivational–value dimension** concerns respect for diverse

perspectives, opportunities for pupil participation, and responsibility for instructional decisions. The **cognitive dimension** involves understanding ICAP modes and their conditions of application. The **operational–methodological dimension** addresses instructional task design and the organization of learning activities. Finally, the **reflective–evaluative dimension** focuses on interpreting learning evidence and making justified instructional revisions.

These dimensions remain theoretical constructs rather than empirically validated components. The proposed assessment indicators primarily address cognitive, operational–methodological, and reflective–evaluative competencies. Assessing the motivational–value dimension would require additional indicators and evidence. Therefore, the existing framework should not be considered a comprehensive measure of all aspects of professional readiness.

Several limitations should be acknowledged. First, the study is theoretical and conceptual; the proposed mechanism has not been empirically tested, and no conclusions can be drawn regarding its effectiveness or causal influence on teacher preparation. Second, the purposive selection of literature supports conceptual development but does not ensure comprehensive coverage. Accordingly, claims concerning the research gap and conceptual contribution are limited to the literature examined.

Further limitations concern the interpretation of observable cognitive engagement. Speaking, writing, or participating in group activities does not necessarily indicate constructive or interactive knowledge-building. Classification requires attention to the content of learners' responses, their reasoning, and the development of ideas through interaction. Nevertheless, observable performance may not fully represent underlying cognitive processes.

The implementation of ICAP-informed instruction also depends on contextual factors, including pupils' age, language proficiency, prior knowledge, classroom interaction, and instructional support. Moreover, evidence generated through university-based microteaching cannot be directly generalized to authentic primary school settings.

Future research should initially examine the content validity of the proposed model and indicators through expert evaluation. Developing explicit performance levels and coding procedures, followed by inter-rater reliability analysis, would strengthen the assessment framework. Comparing pre-service teachers' initial and revised lesson plans, methodological justifications, and microteaching reflections could provide evidence of changes in methodological readiness. Ultimately, evaluating the mechanism's effectiveness will require empirical studies with appropriate comparison conditions and evidence from authentic primary school classrooms.

5. CONCLUSION

This study established the theoretical and methodological foundations for integrating the ICAP framework into the preparation of pre-service primary school teachers to teach "Tarbiya". Its main conceptual contribution is a methodological mechanism connecting theoretical understanding, instructional task design, practical observation, and evidence-informed instructional redesign.

The four ICAP engagement modes "Passive, Active, Constructive, and Interactive" were adapted to the subject-specific objectives of "Tarbiya". Their classification emphasizes learners' observable cognitive activities and knowledge construction rather than the organizational format of instructional tasks.

Methodological readiness was conceptualized as the ability to distinguish engagement modes, design appropriate learning activities, analyze learner performance, and refine instructional decisions. A two-level mechanism linking university-based preparation with primary school practice was proposed, with microteaching serving as an intermediate learning environment. Five assessment indicators were identified to support the future development of a diagnostic rubric.

The findings also highlight the importance of distinguishing cognitive engagement from moral development, as evidence of moral reasoning does not necessarily demonstrate corresponding behavioral change.

As the proposed mechanism remains conceptual, further empirical research is required to establish its validity, assessment reliability, and practical effectiveness in teacher education and primary school settings.

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