

**INTEGRATIVE APPROACH–BASED TECHNOLOGY FOR DEVELOPING THE  
METACOMPETENCE OF PROSPECTIVE PRIMARY SCHOOL TEACHERS**

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**Annotation:** This article explores the development of metacompetence among prospective primary school teachers through an integrative approach. Metacompetence encompasses the ability to regulate learning, integrate interdisciplinary knowledge, reflect on professional actions, and apply flexible pedagogical strategies. A mixed-method study was conducted with prospective teachers to evaluate the effectiveness of an integrative pedagogical technology consisting of interdisciplinary modules, reflective tasks, collaborative activities, and practice-based learning. Findings show that integrative teaching environments significantly enhance students' metacognitive skills, professional adaptability, and problem-solving capacity. Recommendations for teacher education programs are provided.

**Keywords:** metacompetence, integrative approach, pedagogical technology, teacher education, primary school, reflective learning

## **INTRODUCTION**

Contemporary education requires teachers who can think critically, integrate knowledge from diverse disciplines, and adapt their strategies to dynamic classroom environments. This demand has intensified the importance of metacompetence, a high-level professional capacity that enables educators to plan, regulate, evaluate, and flexibly organize their pedagogical actions.

For prospective primary school teachers, metacompetence holds particular significance. They are required to teach multiple subject areas, communicate with young learners, cooperate with parents, and respond to children's developmental needs. However, many teacher training programs still present knowledge in isolated subject blocks, limiting learners' ability to integrate knowledge and apply it in practice.

The integrative approach—which unifies concepts, methods, and learning experiences—has emerged as a powerful tool for competence development. It encourages holistic thinking and supports the transfer of learning across contexts. Despite its recognized potential, practical technologies for developing metacompetence through integration remain insufficiently explored.

This article proposes and analyzes a pedagogical technology based on the integrative approach aimed at fostering metacompetence among prospective primary school teachers.

## **METHODOLOGY**

### **Research Design**

A mixed-method research design was used to obtain comprehensive insights into the effectiveness of the proposed technology. Methods included:

- Pedagogical observation
- Diagnostic testing of metacompetence
- Content analysis of learning outcomes

- Experimental intervention
- Qualitative analysis of reflective journals

## Participants

The study involved 104 prospective primary school teachers enrolled in a pedagogical university. They were assigned to:

- Experimental group: 54 students
- Control group: 50 students

## Research Stages

### Preliminary Stage

- Review of theoretical literature
- Identification of metacompetence components

### Design Stage

- Creation of integrative modules
- Development of assessment tools

### Experimental Stage

- Implementation of the technology in the experimental group
- Traditional instruction in the control group

### Evaluation Stage

- Comparative analysis of pre- and post-results
- Interpretation of qualitative data

## Metacompetence Assessment Indicators

Five core indicators were assessed:

- Cognitive-integrative competence
- Metacognitive regulation
- Reflexive competence
- Communicative competence
- Practical-application competence

## RESULTS

### Initial Diagnostic Results

Both groups demonstrated similar initial weaknesses:

- Fragmented disciplinary knowledge
- Limited metacognitive awareness
- Difficulty connecting theory to practice
- Ineffective self-regulation skills

These results justified the need for integrative development strategies.

#### Structure of the Integrative Technology

The technology comprised four interconnected modules:

##### Interdisciplinary Cognitive Integration

Students engaged in:

- Integrative lectures combining pedagogy, psychology, and methodology
- Thematic tasks linking multiple subject areas
- Concept-mapping activities

Outcome: Students developed more holistic views of pedagogical processes.

##### Metacognitive and Reflective Development

Activities included:

- Learning diaries
- Self-assessment checklists
- Structured reflection prompts

Outcome: Increased awareness of learning strategies and improved self-regulation.

##### Practice-Based Integration

Students participated in:

- Micro-teaching
- Lesson simulation activities
- School-based practice

Outcome: Greater ability to apply theoretical knowledge in teaching situations.

##### Collaborative-Communicative Integration

This module involved:

- Group analysis of pedagogical cases
- Collaborative project work
- Peer-feedback sessions

Outcome: Strengthened communication, teamwork, and problem-solving skills.

## Post-Test Results

In the experimental group, significant improvement was recorded:

- Cognitive-integrative competence increased by 44%
- Metacognitive regulation increased by 49%
- Practical-application competence increased by 41%
- Communicative competence increased by 37%
- Reflective competence increased by 51%

The control group showed only minor changes (7–14%). Qualitative data from journals confirmed that integrative tasks facilitated deeper understanding and confidence.

## DISCUSSION

The findings highlight several key insights:

### Integration Strengthens Holistic Thinking

Students learned to connect pedagogical theory with psychological concepts, subject content, and real-life teaching contexts. This improved their readiness for primary school teaching, where multidimensional knowledge is essential.

### Metacognitive Tools Improve Self-Regulation

Reflective journals and self-assessment forms helped students identify their learning strategies, weaknesses, and progress. This supports the argument that metacognitive training is vital in teacher education.

### Practice-Based Integration Enhances Professional Adaptability

Micro-teaching and school practice allowed students to test integrated knowledge in realistic settings. This promoted adaptability and strengthened professional identity formation.

### Collaborative Learning Enriches Professional Dialogue

Group work fostered communication skills that are crucial for collaboration with colleagues, pupils, and parents.

Overall, the integrative approach proved effective for developing metacompetence in teacher training.

## CONCLUSION

The research demonstrates that an integrative approach is a powerful means of developing metacompetence among prospective primary school teachers. The proposed technology:

- Promotes interdisciplinary thinking
- Enhances metacognitive and reflective abilities
- Strengthens practical teaching competence
- Develops communication and collaboration
- Contributes to competence-based teacher education reforms

Given its effectiveness, the integrative technology can be recommended for wider implementation in teacher training programs. Future research may explore longitudinal effects and expand its application to other educational fields.

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