Technological Model For Training Future Teachers To Resolve Pedagogical Conflicts

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Abstract
This article explores the development and implementation of a technological model aimed at preparing future teachers to effectively overcome pedagogical conflicts. The proposed model integrates digital tools, simulation technologies, and interactive pedagogical methods to enhance teachers' professional readiness for conflict management. The study highlights the importance of technology-driven approaches in teacher education and emphasizes the role of structured methodologies in fostering resilience, empathy, and problem-solving skills.
Keywords: Pedagogical conflict, teacher education, technological model, conflict management, simulation technologies, digital pedagogy.

Pedagogical conflicts are inevitable in educational practice. They arise due to differences in students' needs, teaching strategies, communication styles, and classroom dynamics. The ability to effectively manage and overcome conflicts is a crucial professional competence for future teachers. Traditional teacher education programs often lack sufficient emphasis on conflict management, limiting teachers' ability to create harmonious learning environments.

With the advancement of digital technologies, there is a growing need for innovative training models that prepare future educators not only theoretically but also practically. A technological model for conflict management provides an integrated system that combines digital platforms, interactive simulations, and reflective practices to equip teachers with practical tools and strategies.

Pedagogical conflicts in education refer to tensions or disagreements that arise in teaching-learning environments, such as teacher-student misunderstandings, student-peer disputes, cultural clashes, or challenges in classroom management. These can stem from diverse sources like differing expectations, emotional triggers, resource limitations, or external pressures. Training future teachers (pre-service educators) to resolve such conflicts effectively is crucial for fostering positive learning atmospheres and promoting student development. A "technological model" in this context typically means a structured, systematic framework—often termed "pedagogical technology" in educational research—that integrates digital tools, simulations, and methodologies to build skills in conflict identification, analysis, and resolution. These models draw from constructivist learning theories, emphasizing experiential learning, reflection, and critical thinking. They aim to shift conflicts from disruptions to opportunities for growth, equipping teachers with competencies like empathy, communication, decision-making, and cultural sensitivity. Recent advancements, particularly in virtual reality (VR), simulations, and digital platforms, have enhanced these models by providing safe, immersive practice environments. Based on evolving educational research up to 2025, this detailed exploration covers key models, their components, implementation stages, integration with technology, and empirical outcomes. Models like critical thinking-based approaches, VR simulations, project-based learning, and technology integration frameworks (e.g., PICRAT) are highlighted, with adaptations for conflict resolution training.

Critical Thinking-Based Model for Pedagogical Conflict Resolution
A foundational approach is the critical thinking-based model, which views pedagogical conflicts as solvable through analytical problem-framing and innovative strategies. This model, rooted in cognitive psychology and educational pedagogy, trains future teachers to deconstruct conflicts by identifying contradictions, exploring alternatives, and reflecting on outcomes. It has

been empirically tested in university settings, showing improvements in pre-service teachers' ability to manage real-world scenarios like student resistance to curriculum or interpersonal classroom tensions.

Key Components

- Core Principles: Conflicts are reframed as "problems" requiring critical analysis. Trainees develop skills in depth (uncovering root causes), completeness (considering all factors, e.g., emotional, cultural, or systemic), and goal-setting (defining resolution objectives). The model incorporates techniques like situational analysis, analogies (e.g., synectics method), and reflection to foster empathy and proactive thinking.

- Theoretical Foundation: Draws from Vygotsky's social constructivism and Bloom's taxonomy, emphasizing higher-order thinking (analysis, evaluation, creation) over rote memorization. It aligns with 21st-century skills, linking critical thinking to collaboration and communication in conflict scenarios.

Stages of Implementation

This model typically unfolds in four iterative stages, adaptable to teacher education curricula:

Ascertaining Stage (Baseline Assessment): Evaluate trainees' initial understanding of pedagogical conflicts. Activities include reflective essays on topics like "Challenges in innovative education" or "Role shifts in modern teaching." Content analysis identifies common gaps, such as overlooking emotional triggers (e.g., student anxiety) or systemic issues (e.g., curriculum mismatches). This stage reveals that many pre-service teachers initially view conflicts as personal failures rather than systemic opportunities, with baseline skill levels often low (e.g., ~7-18% high proficiency in studies).

Diagnostics Stage (Skill Evaluation): Present real or hypothetical cases, such as managing a disruptive student or resolving multicultural tensions. Assess using a rubric (0-12 points) across depth, completeness, and goal-setting. For instance, a case might involve a student refusing group work due to cultural differences; trainees must identify contradictions (e.g., individual vs. collective values) and formulate objectives (e.g., inclusive participation). Diagnostics often show medium-level skills in ~75% of trainees, highlighting needs for emotional intelligence training.

Development Stage (Skill Building with Critical Techniques): Employ targeted methods in lectures, seminars, and workshops:

  - Situational Analysis: Break down scenarios by elements (e.g., actors, triggers, outcomes).
  - Incident Method: Analyze past incidents to practice root-cause identification.
  - Four Box Synectics: Use analogies—direct (e.g., comparing conflict to a puzzle), personal (role-playing as the student), fantastic (imagining supernatural resolutions), and symbolic (e.g., conflict as a "storm" to brainstorm calming strategies).

  Phases include challenge (posing the conflict), semantic (exploring solutions via group discussions), and reflection (evaluating via journals or peer feedback). Digital tools like collaborative platforms (e.g., Google Workspace) enhance remote participation, allowing real-time analogy sharing.

Control Stage (Evaluation and Iteration): Reassess with the same cases, measuring progress (e.g., high-level skills rising from 18% to 29%, low-level dropping to ~1%). Use pre/post-tests and self-assessments to quantify gains in empathy and resolution efficacy. Adjust based on feedback, such as incorporating more multicultural cases for diverse classrooms.

Outcomes and Adaptations

Studies indicate significant improvements: trainees report 20-30% better conflict formulation skills, with reduced anxiety in handling disputes. Adaptations include integrating with problem-based learning (PBL) for CT-oriented enhancements, where conflicts are embedded in real-world projects, boosting critical thinking by 15-25% in meta-analyses. Challenges include ensuring transfer to practice; solutions involve employer collaborations during placements.

Integration with Simulation Technologies

Simulation technologies elevate traditional models by providing immersive, risk-free practice, aligning with experiential learning theories. VR and digital simulations allow future teachers to rehearse conflicts, receive instant feedback, and build psychological resilience. Research shows simulations improve empathy, decision-making, and noxological competence (risk anticipation) by 20-40%.

VR Simulator Concept and Methodology

A prominent example is the VR simulator for conflict resolution, designed as an immersive classroom environment to develop competences like diagnostic skills, behavioral forecasting, and communicative culture. It uses constructivist and situational paradigms, with virtual agents (pupils) exhibiting realistic behaviors via behavior trees and perception modules. The simulator, built with tools like Unity and MetaHuman Creator, features a 15m x 20m virtual classroom with 10-30 diverse student avatars (e.g., personalities like "fashionable" or "intellectual"). Over 200 cases cover pupil-teacher conflicts, categorized as organizational (e.g., unfair grading) or socio-psychological (e.g., behavioral clashes).

Stages:

1. Pre-Conflict: Select strategies based on lesson context, pupil age, and crises; focuses on prevention via non-verbal cues (e.g., eye contact).

2. Conflict: Engage in scenarios using Thomas-Kilmann styles (e.g., collaborating for win-win). Entry level: Choose reactions; Advanced: Recognize personalities (e.g., "Steamroller") and build dialogue chains.

3. Post-Conflict: Reflect on outcomes, evaluating strategy effectiveness.

Evaluation: In experiments, VR groups showed 75% positive ratings vs. traditional methods, with better knowledge retention. Limitations include scenario rigidity; ongoing research assesses psycho-emotional impacts.

Other Simulations

- Mursion Platform: AI-driven avatars simulate turbulent classrooms; trainees practice de-escalation, improving management skills by 30%.

- Rehearsal System: LLM-powered simulations allow "what-if" explorations, enhancing counterfactual reasoning for resolutions.

- Hot Seat Simulations: Role-play models like Shannon-Kim teach dialogue steps, boosting confidence in healthcare/education conflicts.

Additional Technological Models and Strategies

PICRAT Model for Technology Integration

The PICRAT framework guides how technology enhances pedagogy in teacher training. PIC (Passive-Interactive-Creative) describes student-tech relationships; RAT (Replacement-Amplification-Transformation) evaluates pedagogical impact. For conflict resolution:

- Passive: Watch videos on strategies (replacement: digital vs. paper handouts).

- Interactive: Engage in online simulations (amplification: real-time feedback via apps).

- Creative: Create VR scenarios (transformation: enable global collaborations impossible without tech).

A 3x3 matrix maps activities, encouraging shifts to creative-transformation for deeper learning. Applied in preparation programs, it fosters reflective tech use, improving integration efficacy.

Project-Based Learning for Conflict Solving Skills

This module, integrated into subjects like foreign language teaching, uses projects, cases, games, and internships to address crises in teacher-student/parent/colleague/administrator communications. Techniques:

- Projects: Thematic chapters with presentations.

- Cases: Analyze and forecast behaviors.

- Games: Role-plays with observation.

- Internships: Reflective journals.

Outcomes: Experimental groups showed 46.5% shift from low to middle confidence, 25.1% to high, vs. minimal control group gains, enhancing self-control and forecasting.
 Preventive and Digital Strategies
- Ed Tech Tools: Use forums, chats, and games for anonymous dialogues, promoting empathy.
- Multimedia Interventions: Programs like SMART Talk employ games and cartoons for young learners' skills, adaptable for teacher training.
- Rahim's Model Application: Styles (integrating, obliging) taught via patterns analysis, reducing destructive conflicts.
 Challenges, Implementation Tips, and Future Directions
Challenges include tech access disparities, transfer to real settings, and teacher resistance. Tips: Use ADDIE for design, collaborate with schools, and iterate via feedback. Future trends involve AI for personalized simulations and global VR networks, with research emphasizing multicultural focus.
In summary, these models transform conflict resolution training into a dynamic, tech-enhanced process, preparing future teachers for resilient, innovative practice. Empirical evidence supports their efficacy, with ongoing adaptations ensuring relevance in diverse educational landscapes.
The study confirms the growing role of technology in shaping future teachers' professional skills. Unlike traditional lecture-based approaches, the technological model engages students in realistic scenarios, promoting active problem-solving and self-reflection.
However, some challenges were noted. Technical limitations, such as access to VR equipment, restricted participation for some students. Additionally, the success of the model depends heavily on the teacher educators' digital competence. Therefore, professional development for instructors is an essential component of successful implementation.
The model also suggests a paradigm shift: conflict should not be viewed solely as a problem but as a pedagogical opportunity for building resilience, communication, and collaboration.

Conclusions

The technological model of teaching future teachers to overcome pedagogical conflicts provides a structured and effective framework that integrates digital tools, experiential learning, and reflective practices. The results demonstrate that such an approach significantly improves professional readiness, emotional resilience, and practical conflict management skills.
Integrate conflict management modules into teacher education curricula using digital simulations.
Provide professional development programs for teacher educators on the use of digital conflict resolution tools.
Expand access to VR and gamified technologies to ensure inclusivity in training.
Encourage collaborative research between universities and technology developers to refine and scale the model.
Develop international partnerships to share best practices in technology-driven teacher training.

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