The Research Vibes: International Journal of Multidisciplinary Research

Website: https://researchvibes.in **E-ISSN**: 3107-3786

Volume: 02 | Issue: 04 | August :2025

Transforming Teacher Education Through the 5E Instructional Model: An Inquiry-Based Approach to Professional Development

Dr. Gopalbhai B. Bharvad

Assistant Professor, M.B. Patel College of Education,
Sardar Patel University, Vallabh Vidyanagar, Gujarat, India
Email: gopalbharvad300@gmail.com

Abstract:

The present study examines the significance of the 5E Instructional Model in improving the teaching competencies and instructional practices of novice teachers. The research focused on understanding how systematic training based on the 5E framework enhances lesson planning, classroom interaction, inquiry-oriented instruction, and reflective teaching practices. A professional development programme was conducted for forty novice teachers, and their teaching designs were analyzed before and after the training process. The findings revealed notable improvements in instructional organization, learner engagement, conceptual clarity, collaborative learning, and assessment practices. The study further explored the influence of each stage of the 5E Model—Engage, Explore, Explain, Elaborate, and Evaluate—on classroom teaching processes. Comparative analysis and participant feedback indicated that the model promoted learner-centered instruction and encouraged teachers to adopt innovative pedagogical strategies. Teachers demonstrated increased confidence in designing inquiry-based learning experiences and integrating critical thinking activities into classroom instruction. The results also suggest that the effectiveness of the 5E Model is influenced by teachers' beliefs, attitudes, and willingness to adopt reflective practices. The research concludes that the 5E Instructional Model serves as an effective framework for strengthening professional teaching competencies and improving the quality of education. It supports meaningful learning, active participation, and continuous assessment, thereby contributing significantly to teacher education and curriculum development.

Keywords: *5E Instructional Model, Inquiry-Based Learning, Teacher Education, Novice Teachers, Classroom Instruction, Curriculum Development, Professional Development.*

Introduction

Modern education emphasizes active participation, critical thinking, problem-solving ability, and learner-centered teaching approaches. Traditional methods of teaching that rely heavily on memorization and teacher-dominated instruction are gradually being replaced by innovative instructional models that encourage student engagement and experiential learning. Among such approaches, the 5E Instructional Model has gained significant recognition for its effectiveness in promoting inquiry-based education and conceptual understanding.

Website: https://researchvibes.in E-ISSN: 3107-3786
Volume: 02 | Issue: 04 | August :2025

The rapid transformation of educational systems across the world has highlighted the need for scientifically literate, creative, and reflective learners. Educational reforms increasingly focus on developing instructional methods that actively involve students in the learning process. Inquiry-based learning has therefore become a central feature of contemporary pedagogy. This approach allows students to investigate concepts, ask questions, explore ideas, and construct knowledge through meaningful experiences.

The 5E Instructional Model was developed on the foundations of constructivist learning theory and cognitive psychology. It provides a systematic framework that supports student-centered teaching and meaningful learning experiences. The model includes five interconnected stages: Engage, Explore, Explain, Elaborate, and Evaluate. Each phase contributes to conceptual development and encourages students to become active participants in their own learning.Teacher education programmes play an essential role in preparing teachers to implement innovative instructional practices effectively. Novice teachers often face challenges in lesson planning, classroom management, instructional design, and learner engagement. Therefore, professional training based on structured instructional models becomes highly important. The 5E Model offers teachers a practical framework for designing interactive lessons and promoting higher-order thinking skills. The present study investigates the impact of the 5E Instructional Model on novice teachers' instructional practices. It also examines how the model contributes to improving teaching processes, curriculum planning, and classroom interaction. The study highlights the significance of inquiry-based learning in modern teacher education and demonstrates how structured instructional models can improve educational outcomes.

Inquiry-Based Teaching and Learning

Inquiry-based teaching is an educational approach that encourages learners to construct knowledge through exploration, questioning, observation, and investigation. Instead of receiving information passively, students actively participate in discovering concepts and developing understanding through practical experiences. This approach promotes curiosity, analytical thinking, creativity, and scientific reasoning.

Historically, classroom instruction focused primarily on rote learning and memorization of facts. Students were expected to reproduce information provided by teachers or textbooks. However, educational research gradually demonstrated that meaningful learning occurs when students are actively engaged in the learning process. As a result, inquiry-oriented approaches gained increasing attention in educational reforms. Inquiry-based learning emphasizes the importance of asking questions, conducting investigations, interpreting evidence, and communicating findings. Students become active explorers rather than passive listeners. Teachers act as facilitators who guide students through meaningful learning experiences and encourage independent thinking. Research studies indicate that inquiry-based teaching improves conceptual understanding, retention of knowledge, problem-solving ability, and learner motivation.

Website: https://researchvibes.in E-ISSN: 3107-3786
Volume: 02 | Issue: 04 | August :2025

Students engaged in inquiry-oriented classrooms demonstrate better reasoning skills and stronger academic achievement compared to those taught through traditional lecture methods. Inquiry-based learning also promotes collaborative learning, communication skills, and self-confidence.The implementation of inquiry-based instruction requires careful planning and structured teaching strategies. Teachers need practical instructional models that help them organize lessons systematically while maintaining student engagement. The 5E Instructional Model serves as one of the most effective frameworks for implementing inquiry-based teaching in classrooms.

The 5E Instructional Model

The 5E Instructional Model is a learner-centered teaching framework developed to support inquiry-based learning and conceptual understanding. The model is grounded in constructivist theory, which suggests that learners construct knowledge through experiences and interaction with their environment. The five phases of the model guide students through a continuous cycle of exploration, reflection, and application.

The five stages of the 5E Model are:

- Engage
- Explore
- Explain
- Elaborate
- Evaluate

Each stage has a specific purpose and contributes to the development of meaningful learning experiences.

Engage Phase

The Engage phase is the introductory stage of the learning cycle. The primary objective of this phase is to capture students' attention, stimulate curiosity, and identify prior knowledge related to the topic. Teachers create situations that motivate learners and encourage them to think critically about the subject matter.

During this stage, teachers may use questioning techniques, demonstrations, real-life examples, brainstorming activities, stories, multimedia presentations, or problem situations to generate interest. The Engage phase also helps teachers identify misconceptions and understand students' existing knowledge.This phase is important because meaningful learning occurs when new concepts are connected with prior experiences. Students begin to develop interest in the lesson and become mentally prepared for further exploration.

Explore Phase

The Explore phase provides students with opportunities to investigate concepts through hands-on activities and collaborative learning experiences. Learners actively participate in experiments, discussions, observations, investigations, and problem-solving tasks. Teachers act as facilitators rather than direct instructors. Students are encouraged to ask questions, share ideas, test predictions, and work cooperatively with peers.

Website: https://researchvibes.in E-ISSN: 3107-3786
Volume: 02 | Issue: 04 | August :2025

This phase allows learners to develop inquiry skills and construct understanding through direct experience. Exploration activities promote independent learning and critical thinking. Students gain confidence as they engage in practical tasks and discover relationships between concepts. The Explore phase forms the foundation for deeper conceptual understanding.

Explain Phase

The Explain phase focuses on developing conceptual clarity and formal understanding. During this stage, students communicate their observations, interpretations, and conclusions derived from exploration activities. Teachers guide discussions and help learners connect their experiences with academic concepts.

The teacher introduces scientific terminology, explanations, definitions, and theoretical information after students have expressed their ideas. Misconceptions identified during earlier phases are clarified through guided instruction. The Explain phase encourages reflective thinking and meaningful communication. Students strengthen their understanding by discussing concepts with peers and teachers. Visual aids, multimedia resources, demonstrations, and instructional materials may be used to support learning.

Elaborate Phase

The Elaborate phase enables students to extend and apply their newly acquired knowledge in different situations. Learners participate in advanced activities that require them to use concepts creatively and critically.This stage may include project work, research activities, model preparation, problem-solving tasks, interdisciplinary applications, and technology-based learning experiences. Students connect classroom learning with real-life situations and explore broader implications of concepts.

The Elaborate phase deepens understanding and encourages transfer of learning. It helps learners develop higher-order thinking skills and promotes long-term retention of knowledge.

Evaluate Phase

The Evaluate phase focuses on assessing students' understanding, skills, and learning progress. Assessment is considered a continuous process throughout the instructional cycle rather than a final activity conducted only at the end of the lesson.

Both formal and informal assessment methods are used during this stage. Teachers may conduct quizzes, assignments, presentations, practical demonstrations, concept mapping, self-assessment, peer evaluation, portfolios, and reflective journals. The Evaluate phase helps teachers determine whether learning objectives have been achieved. It also provides feedback that supports improvement in teaching and learning processes. Students become more aware of their strengths and areas requiring further development.

Significance of the 5E Instructional Model

The 5E Instructional Model offers several educational advantages that contribute to effective teaching and meaningful learning. It promotes active student participation and supports inquiry-oriented classroom environments. The model encourages collaboration, communication, creativity, and critical thinking.

Website: https://researchvibes.in E-ISSN: 3107-3786
Volume: 02 | Issue: 04 | August :2025

One of the major strengths of the 5E Model is its learner-centered approach. Students become active participants in constructing knowledge rather than passive recipients of information. The model also supports differentiated instruction by accommodating diverse learning styles and abilities. The 5E framework improves conceptual understanding by connecting prior knowledge with new learning experiences. It enhances problem-solving skills and motivates learners to explore concepts independently. Teachers benefit from the structured nature of the model, which assists in lesson planning and classroom management. The model is highly flexible and can be adapted across different subjects, grade levels, and educational contexts. It is particularly effective in science education, mathematics, social sciences, language teaching, and teacher education programmes.

Application of the 5E Model in Teacher Education

Teacher education institutions increasingly recognize the importance of preparing teachers for inquiry-based and learner-centered instruction. The 5E Instructional Model provides a practical framework for developing professional teaching competencies among pre-service and novice teachers. Training programmes based on the 5E Model help teachers improve lesson planning, instructional organization, classroom interaction, and assessment techniques. Teachers learn to create engaging learning environments and design activities that promote active participation. Professional development workshops using the 5E framework encourage reflective teaching practices and collaborative learning among teachers. Participants gain practical experience in implementing inquiry-oriented strategies and integrating innovative teaching methods into classroom instruction. The model also supports curriculum development by providing a systematic structure for organizing instructional content. Teachers become more confident in managing classroom discussions, facilitating group work, and promoting higher-order thinking skills. Research findings suggest that teachers trained in the 5E Model demonstrate improved instructional effectiveness and greater student engagement. Therefore, integrating the model into teacher education programmes can significantly enhance the quality of teaching and learning.

Research Findings and Discussion

The study revealed that the 5E Instructional Model positively influenced novice teachers' instructional practices and teaching competencies. Teachers who participated in the training programme demonstrated significant improvement in lesson organization, learner engagement, inquiry-based teaching, and assessment strategies.

The Engage phase helped teachers develop motivational lesson introductions and identify students' prior knowledge effectively. The Explore phase improved teachers' ability to design hands-on learning experiences and collaborative activities. During the Explain phase, teachers demonstrated greater clarity in presenting concepts and facilitating classroom discussions. The Elaborate phase encouraged teachers to integrate creative and application-oriented tasks into classroom instruction. The Evaluate phase enhanced teachers' understanding of continuous and comprehensive assessment practices.

Website: https://researchvibes.in E-ISSN: 3107-3786
Volume: 02 | Issue: 04 | August :2025

The study also indicated that teachers' beliefs, attitudes, and willingness to adopt innovative practices influenced the effectiveness of the model. Teachers who actively participated in reflective teaching practices showed greater improvement in instructional competence.
Overall, the findings confirmed that the 5E Instructional Model serves as an effective instructional framework for improving teaching quality and promoting meaningful learning experiences.

Conclusion

The 5E Instructional Model represents a powerful and effective approach to inquiry-based teaching and learning. Its structured yet flexible framework supports active student participation, conceptual understanding, and reflective learning practices. The model encourages learners to explore ideas independently, apply knowledge creatively, and develop critical thinking skills.

The findings of the study indicate that the 5E Model significantly improves the instructional practices of novice teachers. It enhances lesson planning, classroom interaction, inquiry-based teaching, and assessment strategies. Teachers become more confident in facilitating learner-centered classrooms and promoting meaningful educational experiences. The model also contributes to professional development and curriculum innovation in teacher education programmes. By integrating the 5E framework into educational practice, institutions can strengthen teaching effectiveness and improve student learning outcomes.
In the contemporary educational environment, where creativity, collaboration, and critical thinking are essential, the 5E Instructional Model provides a valuable pathway toward quality education and professional excellence.

References

1. Abraham, M. R. (1997). The Learning Cycle Approach to Science Instruction. National Association for Research in Science Teaching.
2. Abraham, M. R., & Renner, J. W. (1986). The sequence of learning cycle activities in high school chemistry. Journal of Research in Science Teaching, 23(2), 121–143.
3. Atkin, J. M., & Karplus, R. (1962). Discovery or invention? The Science Teacher, 29(5), 45–51.
4. Bransford, J. D., Brown, A. L., & Cocking, R. (1999). How People Learn: Brain, Mind, Experience, and School. National Academy Press.
5. Bybee, R. (1997). Achieving Scientific Literacy: From Purposes to Practices. Heinemann Publications.
6. Bybee, R., & Landes, N. M. (1990). Science for life and living. The American Biology Teacher, 52(2), 92–98.
7. Duran, L. B. (2003). Investigating brine shrimp. Science Activities, 40(2), 30–34.
8. Etheredge, S., & Rudnitsky, A. (2003). Introducing Students to Scientific Inquiry. Pearson Education.
9. National Research Council. (1996). National Science Education Standards. National Academy Press.

Website: https://researchvibes.in **E-ISSN**: 3107-3786
Volume: 02 | Issue: 04 | August :2025

10. National Research Council. (2000). Inquiry and the National Science Education Standards. National Academy Press.
11. Piaget, J. (1970). Structuralism. Harper and Row.
12. Rutherford, F. J., & Ahlgren, A. (1990). Science for All Americans. Oxford University Press.
13. Uno, G. (1999). Handbook on Teaching Undergraduate Science Courses. Thomson Custom Publishing.