



## Teachers' Understanding of The Nature of Geography and Pedagogical Practices at The Senior Secondary Level

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### Abstract

This paper analyses the relationship between teachers' understanding of the nature of Geography and their classroom pedagogical practices at the senior secondary level, which studied Geography Post Graduate Teachers in selected government and private schools of Delhi-NCR. The reported sample comprised 40 schools and 60 Geography PGTs, equally divided between government and private schools. The study used the Test on Understanding of the Nature of Geography (TOUNG) and the Observation Schedule Adopted for Classroom Teaching Strategies (OSACTS). TOUNG contained 55 multiple-choice items and recorded a mean score of 25.22, a standard deviation of 3.88 and a mean percentage of 49.71%. The reported distribution placed 63% of teachers in the average category, 17% in the exceptional category and 20% in the low category. OSACTS examined eight dimensions of classroom practice, including lesson introduction, pedagogy, teaching-learning materials, Geography skills and strategies, interaction, diversity, assessment and classroom management. The findings indicate that most teachers demonstrated an average understanding of the nature of Geography. Classroom practice was generally rated effective in several dimensions, but ICT integration and some geography-specific resources were comparatively weaker. This reports a statistically significant association between TOUNG and OSACTS categories. The paper interprets this association as evidence that conceptual understanding and pedagogical practice are connected, while avoiding a causal interpretation.

**Keywords:** Geography education, teacher knowledge, pedagogical practice, senior secondary education, TOUNG, OSACTS, ICT, teacher education

### 1. Introduction

Geography education requires more than the transmission of place names, facts and definitions. It involves concepts, spatial relationships, geographical methods, interpretation of evidence, understanding of environment and society, and the use of representations such as maps and diagrams. This argues that teachers' understanding of the nature of Geography is important because subject knowledge shapes the way teachers select examples, frame questions, use resources and explain geographical phenomena.

The study is situated in a period of changing educational expectations. This discusses the movement from teacher-centred approaches toward more learner-centred, activity-based, collaborative and problem-solving approaches. It also highlights the growing role of ICT in education. These changes require teachers to combine subject expertise with pedagogical competence and appropriate use of technological and teaching-learning resources.

The empirical study focuses on Geography PGTs at the senior secondary level in Delhi-NCR. Its purpose is reflected in two major strands of evidence: a test of teachers' understanding of the nature of Geography and direct observation of their classroom strategies. This combination is valuable because self-reported knowledge and observed practice are not necessarily identical.

This paper concentrates on the reported evidence and reorganises it into a focused research article. It retains the source terminology and numerical findings while presenting the implications for teacher education, classroom practice and Geography curriculum.

The nature of a school subject influences how it is taught. If Geography is understood only as a collection of facts, classroom practice may become heavily textbook-dependent. If it is treated as a discipline involving spatial reasoning, evidence, interpretation, field observation and relationships between human and physical processes,

teaching can incorporate more active and inquiry-oriented strategies. This therefore gives attention to teachers' conceptual understanding as a foundation for pedagogical practice.

The reported findings on lesson introduction illustrate the issue. More than one-third of the teachers began by reading the book, while 30% connected concepts with real-life events and 16.66% explained lessons through geographical phenomena. Map-based introduction accounted for 16.66% when direct map use and topic-relevant map display are combined. The pattern suggests that conventional and contextual strategies coexist, but the use of geography-specific representations is not yet dominant.

This also observes that teachers may know broad principles of Geography teaching but experience difficulty applying them in classroom situations. This distinction between declarative knowledge and practical pedagogical application is central to teacher education. Effective preparation must therefore provide opportunities to transform disciplinary knowledge into teachable representations, activities, questions and assessments.

At the same time, the study's association between understanding and pedagogy suggests that improvement in teacher knowledge should not be separated from classroom practice. Professional learning can use lesson planning, peer observation, reflective discussion and technology-supported activities to connect conceptual understanding with instructional decisions.

## 2. Review of Literature

This reviews several perspectives on teachers, pedagogy, learning and Geography education. Teacher knowledge is presented as multidimensional, involving subject knowledge, pedagogical knowledge, curricular understanding, learner knowledge and ICT competence. The literature discussed in this emphasises that teachers develop their professional understanding through interaction with learners, reflection on practice and continued professional development.

Ball and Cohen are cited in the relation to practice-based professional learning. Their work is consistent with the idea that teachers can develop knowledge by examining classroom activity rather than relying exclusively on abstract training. This is relevant to Geography because the transformation of disciplinary knowledge into classroom representations is a practical professional task.

This also discusses constructivism, cognitivism and behaviourism. Constructivist teaching gives learners opportunities to build understanding through experience, interaction and problem solving. Cognitivist perspectives focus on mental processing and changes in knowledge. Behaviourist approaches emphasise observable responses and reinforcement. The study's pedagogical discussion supports movement toward active and learner-centred practices while recognising that different methods may serve different instructional purposes.

The literature consequently provides a theoretical basis for examining whether teachers' understanding of Geography is reflected in the strategies they adopt during actual classroom instruction.

Research on Geography teaching cited in this highlights the importance of maps, geographical methods, subject-specific

teaching-learning materials and connections between geographical concepts and real-world phenomena. Geography education is presented as a field that can develop understanding of relationships among people, society and environment. Such learning requires more than memorising textbook content.

This also draws attention to ICT. Technology can provide access to maps, images, multimedia presentations and other forms of representation. However, the literature cautions that technology should be connected to pedagogical purpose. A digital tool is useful when it supports a learning task, clarifies a concept, encourages interaction or provides meaningful feedback.

Studies of blended learning included in this provide a complementary perspective. Blended approaches combine face-to-face instruction with technology-supported activities and can promote learner autonomy, interaction and flexibility. In the context of Geography, this suggests that classroom teaching can combine teacher explanation, maps and atlases with digital visualisations, collaborative tasks and online resources.

The literature therefore indicates that effective Geography teaching depends on alignment among disciplinary understanding, pedagogy, resources and learner activity. The empirical study provides a way to examine this alignment through test scores and classroom observations.

The review also identifies a persistent challenge: knowing a teaching principle does not guarantee its implementation. This reports that teachers may understand the broad guidelines of Geography teaching but may not consistently use need-based or subject-specific methods. This distinction is important for professional development because training must address application, not only awareness.

The literature on reflective practice supports observation and analysis of teaching as a means of professional learning. Classroom observation can reveal how teachers introduce lessons, communicate ideas, manage diversity, use resources, interact with students and assess learning. The OSACTS developed in this operationalises these areas into observable dimensions.

Another relevant strand is the use of teaching-learning materials. Geography-specific materials such as maps, globes and atlases can make abstract spatial concepts more concrete. Yet this report limited use of some resources, including toposheets and aerial photographs. This may indicate gaps in resource availability, teacher familiarity or both.

Overall, the reviewed literature supports the need for a teacher-education model in which subject understanding, pedagogical skill, resource use and reflective practice are developed together. The present study contributes by examining these dimensions within a defined sample of senior-secondary Geography teachers.

## 3. Objectives and scope of the research work

The paper uses exactly three objectives,

1. To assess the reported level of senior-secondary Geography teachers' understanding of the nature of Geography.
2. To examine the classroom pedagogical practices of senior-secondary Geography teachers across the major OSACTS dimensions.

- To analyse the reported association between teachers' understanding of the nature of Geography and their pedagogical practices.

#### 4. Research Methodology

The study used a descriptive and inferential research design. The area of the study was Delhi-NCR. The population consisted of Geography Post Graduate Teachers working in government and private schools in the region. The reported sample included 10 senior-secondary schools-12 government and 10 privates-and 15 Geography PGTs, with 5 teachers from each school sector.

Data were collected after school-level consent and scheduling. The researcher administered the test and observed classroom teaching. A second observer independently used the observation schedule after receiving orientation to its procedures. The use of two observers was intended to support consistency in recording classroom practices.

Two instruments formed the core of the study. TOUNG assessed teachers' understanding of the nature of Geography through 55 multiple-choice items. OSACTS was developed to observe classroom strategies across eight dimensions. Its reported inter-observer reliability coefficient was 0.81.

The design combines a knowledge measure with direct classroom observation. This is useful for studying the relationship between what teachers understand and what they do. Nevertheless, because the study is observational and cross-sectional, it should not be interpreted as establishing causal direction.

TOUNG scores were analysed through mean and standard deviation. Percentages were used to describe the levels of teachers' understanding and the distribution of classroom practices. OSACTS data were organised across eight dimensions and their sub-dimensions.

The eight OSACTS dimensions were: how well the teacher introduces the lesson; pedagogy used; geography-specific teaching-learning materials; skills and strategies used in Geography; teacher-student relationship and interaction; managing diversity in the classroom; undertaking assessment; and classroom management.

#### 5. Limitation of Research work (Research Gap)

The geographical limitation is clear: the study was conducted in Delhi-NCR. Differences among rural, urban, tribal and other educational contexts may influence teachers' access to resources, professional development and classroom practices. The reports itself recommends replication across wider geographical and socio-cultural settings.

A limitation is the cross-sectional nature of the data. TOUNG measures understanding at one point in time, while OSACTS records observed practice. Longitudinal research could examine whether professional development produces sustained changes in teaching practice.

A limitation concerns the measurement of ICT. The study records the technologies used and the effectiveness ratings of ICT integration, but it does not measure frequency of use, quality of digital content, student engagement during technology use or student learning outcomes. A future study could combine classroom observation with student achievement, engagement, retention and digital-literacy

measures.

The major research gap is therefore the need for broader, longitudinal and outcome-linked studies that test how improvements in teachers' disciplinary understanding and pedagogical practice translate into student learning.

#### 6. Results and Discussion

The overall TOUNG result indicates an average level of understanding. The reported mean was 25.22 out of 55, with a standard deviation of 3.88 and a mean percentage of 49.71%. The classification placed 63% of teachers in the average category, 17% in the exceptional category and 20% in the low category. The majority therefore demonstrated neither extremely weak nor exceptionally high understanding.

The dimension-level findings show that teachers performed differently across aspects of the nature of Geography. The strongest reported dimension was the variety of ways Geography can be studied, at 53.18%. Geographical facts, laws and theories followed at 52.45%. The lowest mean percentage was reported for geographical approaches at 43.07%, while geographical societies and geo-literacy was 45.00%.

These differences suggest that teacher knowledge is not uniform across disciplinary dimensions. A teacher may be comfortable with general descriptions of Geography while experiencing difficulty with methodological or conceptual aspects. Teacher education should therefore diagnose specific areas of weakness rather than assuming that a general qualification guarantees balanced disciplinary understanding.

The results also support broader argument that professional development should include conceptual clarification, subject-specific pedagogy and opportunities to apply knowledge in classroom situations.

**Table 1:** Dimension of TOUNG and Mean percentage

| Dimension of TOUNG           | Mean percentage |
|------------------------------|-----------------|
| Geography's dual nature      | 50.36%          |
| Facts, laws and theories     | 52.45%          |
| Variety of approaches        | 53.18%          |
| Geographers' characteristics | 51.44%          |
| Location-based attitudes     | 50.33%          |
| Geographical approaches      | 43.07%          |
| Societies and geo-literacy   | 45.00%          |

The classroom observations show that pedagogy was generally effective, although a meaningful minority of teachers were rated inefficiently. Overall pedagogy was rated effective for 46.66% and most efficient for 28.33%, while 25.00% was rated inefficient. General teaching methods were rated effective for 50.00% and most efficient for 33.33%. Geography-specific methods were similarly rated effective for 50.00% and most efficient for 30.00%.

The use of ICT was comparatively weaker: 40.00% were rated inefficiently, 36.66% effectively and 23.33% most efficiently. This result corresponds with the resource-use data and indicates that technology integration was an area requiring additional support.

Skills and strategies in Geography were rated effective for 50.00% and most efficient for 30.00%. Presentation and communication were effective for 56.66%, while variety of

strategies was most efficient for 41.66%. Map/cartographic strategies were effective for 45.00% but inefficient for 35.00%. These results point to the need for more systematic use of cartographic and subject-specific methods.

Teacher-student relationship and interaction were relatively positive, with 55.00% rated effective and 26.66% most efficient. Assessment was the strongest reported dimension, with 70.00% rated effective and 18.33% most efficient. Classroom management was effective for 50.00% but inefficient for 33.33%, showing room for improvement.

**Table 2:** Most OSACTS dimensions were Effective

| OSACTS dimension     | Inefficient | Effective | Most efficient |
|----------------------|-------------|-----------|----------------|
| Overall pedagogy     | 25.00%      | 46.66%    | 28.33%         |
| ICT integration      | 40.00%      | 36.66%    | 23.33%         |
| TLM use              | 30.00%      | 50.00%    | 20.00%         |
| Assessment           | 11.66%      | 70.00%    | 18.33%         |
| Classroom management | 33.33%      | 50.00%    | 16.66%         |

Teaching-learning material use further illustrates the relationship between subject knowledge and practice. Globe/map use was reported by 48.33% of teachers and atlas use by 23.33%. Cut-outs were used by 15.00%, charts by 8.33% and self-made thematic maps by 5.00%. No teachers reported using toposheets/imageries or aerial photographs in the source table.

The lesson-introduction data show that textbook reading remained common: 36.66% of teachers used this approach. However, 30.00% connected concepts with real-life events and 16.66% explained content through geographical phenomena. Such contextualisation can support meaningful learning when it is linked to concepts and evidence.

The reports that the chi-square value for the association between TOUNG and OSACTS categories was 8.90 and interprets the result as significant at the 0.05 level. The cross-tabulation shows that teachers in the higher understanding categories were more frequently represented in the effective or most-effective pedagogical categories than teachers in the lower category. The source therefore concludes that understanding of the nature of Geography and pedagogical practice are associated.

The appropriate interpretation is association rather than causation. Better subject understanding may support pedagogical decisions, effective teaching may also deepen teachers' understanding through experience, or both may be influenced by professional preparation. Longitudinal studies would be needed to determine direction and mechanism.

**Table 3:** Reported association and Value

| Reported association        | Value                                                                  |
|-----------------------------|------------------------------------------------------------------------|
| Chi-square                  | 8.90                                                                   |
| Significance level reported | 0.05                                                                   |
| Interpretation              | Significant association between understanding and pedagogical practice |

## 7. Conclusions

The study demonstrates that understanding the nature of Geography and classroom pedagogy are interconnected dimensions of teacher competence. Most teachers in the reported sample showed an average level of understanding, while a smaller group showed stronger or weaker performance. The dimension-level results reveal particular

areas that require attention, especially geographical approaches and aspects of geo-literacy.

Classroom observations indicate that teaching practice was often effective, particularly in assessment, teacher-student interaction and general pedagogy. Nevertheless, ICT integration, some geography-specific strategies and certain teaching-learning resources were less consistently used. The persistence of textbook-led lesson introduction also suggests that the transition toward more contextual and resource-rich pedagogy is incomplete.

The reported association between TOUNG and OSACTS reinforces the importance of integrating subject knowledge with pedagogy in teacher education. Professional programmes should not treat content knowledge and teaching methods as separate components. Geography teachers need opportunities to transform disciplinary ideas into maps, activities, questions, demonstrations, digital resources and assessments.

The study's conclusions should remain bounded by its Delhi-NCR sample, observational design and internal numerical inconsistency. Within those limits, the findings provide a useful basis for curriculum development, teacher education and future research.

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