UGC-NET Paper I Unit II: Research Aptitude – Notes

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1. Meaning and Characteristics of Research

Research is a systematic, objective and critical inquiry to discover new facts, verify old ones, or develop theories. Redman and Mory defined it as a 'systematised effort to gain new knowledge'. The word comes from the French *recherche*, meaning to search again.

Characteristics: systematic and logical; empirical (based on observation and evidence); objective; replicable and verifiable; controlled; critical; directed towards solving a problem; leads to generalisations or theory.

2. Types of Research

Basis	Types	Key point
Purpose	Fundamental (basic/pure)	Develops theory and knowledge for its own sake
	Applied	Solves practical, immediate problems
	Action research	Practitioners study and improve their own practice; term by Kurt Lewin, popularised in education by Stephen Corey
Objective	Descriptive	Describes 'what is' (surveys, case studies)
	Analytical	Uses existing facts to critically evaluate
	Exploratory	Explores a new or unclear problem; formulates hypotheses
	Explanatory/causal	Explains cause-effect relationships
Nature of data	Quantitative	Numbers, measurement, statistics
	Qualitative	Words, meanings, experiences
Time	Cross-sectional	Data at one point in time
	Longitudinal	Same subjects studied over time
Control	Experimental	Researcher manipulates variables
	Ex post facto	Studies causes after effects have occurred; no manipulation
Other	Conceptual vs empirical	Ideas and theory vs observation and experiment

3. Positivism and Post-positivism

Positivism	Post-positivism
Founded by Auguste Comte	Associated with Karl Popper and critical realism
Single objective reality, knowable through senses	Reality exists but is known only imperfectly
Scientific method, quantification, verification	Falsification: theories can be refuted, not finally proved
Researcher is neutral and detached	Researcher's values can influence; objectivity is an ideal
Deductive, hypothesis-testing	Uses multiple methods (triangulation)

Other paradigms: **interpretivism** (understanding meanings; Max Weber's *Verstehen*), **critical theory** (Frankfurt School; research for social change), and **pragmatism** (mixed methods).

4. Methods of Research

Experimental method

- The researcher manipulates the **independent variable** and observes its effect on the **dependent variable**, controlling **extraneous variables**.
- Uses experimental and control groups; randomisation controls bias.
- **Internal validity:** whether change in the dependent variable is really due to the independent variable. **External validity:** whether results can be generalised.
- Designs: pre-experimental, true experimental (randomised), quasi-experimental (no random assignment), factorial.

Descriptive method

- Describes existing conditions without manipulation: surveys, case studies, correlational studies, developmental studies, document analysis.

Historical method

- Studies past events using **primary sources** (original documents, eyewitness accounts) and **secondary sources** (later accounts).
- **External criticism** tests the authenticity (genuineness) of a source. **Internal criticism** tests the credibility (accuracy) of its content.

Qualitative methods

Method	Focus
Ethnography	Culture of a group, through participant observation
Phenomenology	Lived experiences of individuals
Grounded theory (Glaser and Strauss, 1967)	Theory built from data
Case study	In-depth study of one unit
Narrative research	Life stories

Quantitative methods use measurement, large samples, statistical analysis and generalisation. **Mixed methods** combine both.

5. Steps of Research

1. Identifying and formulating the research problem.
2. Review of literature.
3. Formulating objectives and hypotheses.
4. Preparing the research design.
5. Determining the sample (sampling design).
6. Collecting data (tools: questionnaire, schedule, interview, observation, tests, scales).
7. Analysing data.
8. Testing hypotheses and interpreting results.
9. Generalisation and conclusions.
10. Preparing the research report.

Hypothesis: a tentative, testable statement about the relationship between variables. A **null hypothesis (H_0)** states no relationship or difference; an **alternative hypothesis (H_1)** states that one exists.

Sampling

Probability sampling	Non-probability sampling
Simple random	Convenience (accidental)
Systematic	Purposive (judgemental)
Stratified	Quota
Cluster and multi-stage	Snowball (chain referral)

Tools: a *questionnaire* is filled in by the respondent; a *schedule* is filled in by the enumerator. The **Likert scale** (usually 5-point) measures attitudes. **Triangulation** uses several methods, sources or researchers to cross-check findings.

6. Thesis and Article Writing

Structure of a thesis

1. Preliminary pages: title page, declaration, certificate, acknowledgements, abstract, contents, list of tables and figures, abbreviations.
2. Introduction: background, problem, objectives, hypotheses, significance, scope.
3. Review of literature.
4. Research methodology.
5. Data analysis and results.
6. Discussion and interpretation.
7. Summary, conclusions, suggestions and scope for further research.
8. References/bibliography and appendices.

Research article: usually follows **IMRaD** — Introduction, Methods, Results and Discussion — preceded by title, abstract and keywords, and followed by references. The **abstract** (usually 150–300 words) briefly summarises purpose, method, findings and conclusion.

Bibliography vs References: a reference list includes only works cited in the text; a bibliography includes all sources consulted.

Referencing styles

Style	Main use	In-text format
APA (American Psychological Association), 7th ed. 2019	Social sciences, psychology, education	Author-date: (Sharma, 2020)
MLA (Modern Language Association), 9th ed. 2021	Humanities, languages, literature	Author-page: (Sharma 45)
Chicago	History, humanities	Notes-bibliography (footnotes) or author-date
Harvard	Many disciplines	Author-date

Common Latin abbreviations

Abbreviation	Meaning
Ibid. (ibidem)	Same source as the immediately preceding note
Op. cit. (opere citato)	In the work already cited (with other notes in between)
Loc. cit. (loco citato)	In the same place (same page) already cited
et al.	And others (for multiple authors)
Cf.	Compare
viz.	Namely

7. Application of ICT in Research

Purpose	Tools and resources
Literature search	Google Scholar, JSTOR, Scopus, Web of Science, ERIC, PubMed
Indian e-resources (INFLIBNET)	Shodhganga (repository of Indian PhD theses), Shodhgangotri (synopses), e-ShodhSindhu (e-journal consortium), Vidwan (expert database), IRINS
Quantitative analysis	SPSS, R, STATA, EViews, Excel, Python
Qualitative analysis	NVivo, ATLAS.ti, MAXQDA
Reference management	Mendeley, Zotero, EndNote
Plagiarism detection	DrillBit (provided to Indian universities through INFLIBNET), Turnitin, iThenticate
Data collection	Google Forms, SurveyMonkey, online interviews

Research metrics

- **Impact factor:** average citations per article in a journal over two years (Eugene Garfield; published by Clarivate in Journal Citation Reports).
- **h-index** (J.E. Hirsch, 2005): a researcher has index h if h papers have at least h citations each.
- **i10-index** (Google Scholar): number of papers with at least 10 citations.
- **DOI:** Digital Object Identifier, a permanent link to a publication. **ORCID:** a unique researcher identifier. **ISSN** for journals; **ISBN** for books.

8. Research Ethics

Core principles: honesty, objectivity, integrity, carefulness, openness, respect for intellectual property, confidentiality, responsible publication, social responsibility, and respect for participants.

Research misconduct (FFP):

- **Fabrication:** making up data or results.
- **Falsification:** manipulating data, equipment or processes so the record is inaccurate.
- **Plagiarism:** using another's ideas or words without credit. Self-plagiarism and duplicate publication are also misconduct.

Ethics with human participants: informed consent, voluntary participation, right to withdraw, privacy and confidentiality, avoidance of harm, and approval by an Institutional Ethics Committee. The **Belmont Report** (1979) lists three principles: respect for persons, beneficence and justice.

UGC (Promotion of Academic Integrity and Prevention of Plagiarism) Regulations, 2018

Level	Similarity	Consequence (for theses)
Level 0	Up to 10%	Minor; no penalty
Level 1	Above 10% to 40%	Revised script within 6 months
Level 2	Above 40% to 60%	Debarred from submitting a revised script for one year
Level 3	Above 60%	Registration for the programme cancelled

Other ethical issues: proper authorship credit, disclosure of conflicts of interest, avoiding predatory journals, and data sharing. UGC set up the **UGC-CARE** (Consortium for Academic and Research Ethics) in 2019 to promote quality research publication.