

Research Methodology

(ENG518)

Lesson-01**WHAT IS RESEARCH?****Topic-001: What is Research?**

The course provides in-depth understanding of research methodologies. The focus is emphasize each step involved in research methodology starting from locating the research problem to designing and developing a complete research. The course will equip the students with the awareness of the distinctive concepts of research process and their varied implementation.

The course aims to:

- understand and have an overview of the fundamentals of research methods used in the field of English Language Teaching (ELT)
- critically evaluate a research problem and formulate research questions and objectives for a study to address the issue.
- formulate (in a particular context) the major components of a research study (e.g., title, abstract, introduction, research design, discussion and conclusion)
- present a research proposal and critically argue to defend the research design

Research is a systematic inquiry that investigates hypotheses, suggests new interpretations of data or texts, and poses new questions for future research to explore (Jolla, 2015).

Research consists of:

- Asking a question that nobody has asked before;
- Doing the necessary work to find the answer; and
- Communicating the knowledge you have acquired to a larger audience.

In practice, research methods vary widely, depending upon the academic discipline's accepted standards, the individual researcher's preferences, or a particular study's needs. Research in science and engineering often involves conducting experiments in the lab or in the field. Research in the arts, humanities, and social sciences may include archival work in the library or on the internet, conducting surveys or in-depth interviews, and a wide range of creative and artistic projects- from costume design to playwriting to curating a fine arts exhibit.

Topic-002: Definitions of research

In the broadest sense of the word, research includes any formal gathering of data, information and facts for the advancement of knowledge.

Research is conducted according to the researcher's intention, their purpose, and the paradigm they are operating from within. While many people use the word "research" to loosely mean "gathering information" scientists use this word in a more specific way. The term "research" in a scientific context usually refers to the entire scientific method from start to finish.

Research adds to the scientific knowledge of the subject. According to Francis G. Cornell, it is a reliable

verifiable and exhaustive process. Research is a careful inquiry or examination in seeking facts or principles (Clifford Woody Uof Michigan), it urges for the discovery of truth (critical thinking), defining and redefining problems, formulating hypotheses (or suggesting solutions) collecting, organizing and evaluating data, making deductions and reaching conclusions.

CC Crawford says that research is simply a systematic and refined technique of thinking, employing specialized tools, instruments, and procedures; we opt for research to obtain a more adequate solution of a problem than would be possible under ordinary means. Encyclopedia of Social Science defines it as the manipulation of things concepts or symbols-generalizing to extend, correct or verify knowledge. V. Redman and A.V.H. Mory state that research is a systematized effort to gain new knowledge. Francies Rummel discussed about research as an endeavor to discover, develop and verify knowledge, an intellectual process which is developed over hundreds of years, ever changing in purpose and form and always searching for truth. According to P.M. Cook, research is an honest exhaustive, intelligent searching for facts and their meanings or implications with reference to a given problem. The product or findings of a given piece of research should be an authentic, verifiable contribution to knowledge in the field studied.

Topic-003: General Characteristics of Research

The characteristics of research are:

- The nature of research is systematic-logical- empirical-reductive-replicable.
- It gathers new knowledge or data from primary or first-hand sources.
- Emphasis upon the discovery of general principles
- Exact systematic and accurate investigation involved
- Uses certain valid data gathering devices
- Logical and objective
- Resists the temptation to seek only the data that support his hypotheses
- Eliminates personal feelings and preferences
- Patient and unhurried activity
- Carefully recorded and reported
- Conclusions and generalizations are arrived at carefully and cautiously

Topic-004: Functions of Research

Research is the name of seeking new knowledge for continuous improvement.

- Through research refinement and extension of knowledge happens, it provides baseline data or simply a picture of how things are.
- Research makes decision-making easier, concerning the acquisition of knowledge in a specific field
- It improves learning and teaching processes
- It improves various aspects of human life

Topic-005: Specific Characteristics of ELT Research

There are 50 + research journals (TESOL website) available to take guidance regarding ELT research.

Why such a huge research is there in ELT? It provides a sound philosophy, deep insight and imaginative.

It offers problem solving techniques. ELT research is both theoretical and applied. ELT research desires to make things better, improving teaching and learning. It is not as exact as physical sciences, also involves subjectivity. There is no restriction for ELT research to be held by specialists only. It is an interdisciplinary research. It can bridge Psychology [e.g., motivation and anxiety] and Sociology [e.g., cultural assimilation and social varieties].

Lesson-02**RESEARCH IN ENGLISH LANGUAGE TEACHING (ELT) [APPLIED LINGUISTICS]****Topic-006: Identifying Important Questions in ELT**

First of all, identify that for whom this research is going to be? Who will be the beneficiary of the research? The following areas would be the matter of concern in ELT research:

- Understanding of language issues
- Students
- Teachers (ES/FL)
- Admin
- Parents
- Stakeholders

Massive number of questions and answers have been asked and investigated in the field of English language teaching. Anything related to language and society, learning, teaching, management, decision making and researchers can be a topic of concern in ELT research.

Topic-007: What is ELT Research About?

ELT research has vast domains of topics. There are massive questions and answers. Anything related to language, practical issues, problems related to second or foreign language, language policy are involved in the paradigm of ELT research. Applied Linguistics topics such as bilingualism, multilingualism, language education, the preservation and revival of endangered languages, assessment and evaluation, treatment of language, professional communities and cross-cultural communication are also part of ELT research.

Topic-008: Why is Research in ELT (AL) Important?

Is language important? English language teaching has major challenges regarding quality of learning and teaching to study. Consumers of ELT research are also emphasized while conducting research in ELT. Usually, there is not a single way of teaching; method of teaching varies on the basis of cultures, norms, policies, countries, languages, subjects etc. ELT research looks into all these ways of teaching. Researchers study the use of many different sets of materials to teach distinctively. The ways of conveying information are also different leads to the questions of what to teach and how to teach? Similarly, we have different methods of assessment and evaluation and different uses of technology in classrooms. Then, researchers are also keen to know learners and teachers perspectives regarding all the issues in education at (L) Linguistic levels and also (T) Identity – tech incorporation.

Topic-009: Demythologizing Research

Research has some particular elements attached to it that are for instance, searching articles and writing papers, working in labs, performing artificial experiments, experimented only by experts. There

are many more also.

A true research has following characteristics:

- Provides clear understanding of meaning
- An earnest activity
- Helps solving problems
- Carried out by skillful practitioners
- Follows a systematic research process
- Answers of 'What/why' questions
- Creates more questions
- Data is gathered, analyzed and conclusion is drawn out of it

Topic-010: Identifying Important Questions in ELT

How would we create research questions in ELT? There are some most common motivating forces like practical problems (Ferris, 1995 and Arva & Medgyes, 2000), questions in secondary sources (Textbooks/theoretical papers), primary research (sampling/design/discussions/recommendations) that lead us to locate issues and form important research questions.

Questions for research

Identify a question you have in the area of teaching or learning, the question can be identified through following sources:

- Having an experience
- Use of secondary sources (Textbooks/theoretical papers)
- Reading discussion sections of related researches
- How is that important for others?

Lesson-03**CLASSIFICATION OF RESEARCH****Topic-011: Classification of Research****Levels of research**

There are two basic levels of research

- Basic
- Applied

Basic and applied research

Characteristics of Basic research

- Theoretical
- Contributing to subject knowledge
- No immediate value
- Used for broader studies

Characteristics of Applied research

- Action research
- Solving problems
- Specifying a problem

Topic-012: Major Types of Research

Types of research on the basis of research objectives

- Fundamental
- Action

Types of research on the basis of Nature of research

- Exploratory
- Confirmatory

Types of research on the basis of Data collection procedures

- Qualitative
- Quantitative

Types of research on the basis of Application of research

- Longitudinal
- Cross-sectional
- Conceptual
- Empirical

Other types of research

- Educational research
- Historical research

Topic-013: Educational Research

In educational research, the issues of influencing educational theories and practices are emphasized.

Educational problems are focused in:

- Library
- Field

Educational philosophy is studied and investigated. Educational curriculum development is achieved. Educational research also concerns regarding learning and teaching methods. It focuses on teacher education.

Influencing educational theory and practices

There are some key issues that are taken in to consideration during educational researches:

- Teacher behavior
- Educational administration and supervision
- Educational technology
- Research having educational implication
- Educational significance

Topic-014: Scientific Ways to Solve Problems

Non-scientific ways may solve your issues, but one needs to have the characteristics of tenacity, intuition, authority, rationalistic approach and experience to successfully incorporate a non-scientific research in ELT.

Scientific ways to solve problems

Scientific ways may solve your issues, by following a systematic process that consists of following steps:

- Developing the problem
- Forming the hypothesis
- Gathering the data
- Analyzing and interpreting data
- Conclusion

Topic-015: Characteristics of an Investigator**Effective investigator**

The characteristics of an effective investigator/researcher are as follows:

- Full understanding of functions and activities
- Reflective thinking
- Sensitive towards job

- Creative and imaginative
- Knowledge of action research
- Insightfulness
- Scientific attitude towards studying (observing problem)
- Objectivity in thinking
- Democratic behavior
- Patience
- Knowledge of measuring tools
- Open-minded
- Excellence in job
- Frugal

Lesson-04**ASSORTMENT OF A PROBLEM****Topic-016: Assortment of a Problem**

First step in research is the selection of a problem. A problem is selected through reflective thinking towards a target issue; a careful ordered thinking is required. After selecting a problem the keen understanding and evaluation of the research problem is required.

Reflective and scientific thinking

Reflective thinking involves:

- Occurrence of a problem
- Definition
- Explanation
- Elaboration
- Collection
- Conclusion

Scientific thinking involves:

- Inductive-deductive reasoning
- Cause and effect
- Assumption/hypothesis/objective/data driven

Topic-017: Identification of a Problem**First and most crucial step**

To identify a problem, a researcher needs to know about the following things:

- Exact nature and dimensions of the problem
- Research field
- Mastery of the area
- Basis for literary survey
- Priority field of study
- Definitions/analogies
- Pinpoint specific aspects

Sources of a problem

A researcher can find research problem through various resources like:

- Personal experience
- Studying available literature
- Innovation (technological changes)
- Discussions in professional circles
- Secondary sources; publications/reports

Topic-018: Criteria for the Selection of a Problem

Before selecting specific research problem, it is crucial to follow a criterion. Points to be kept in mind for selection of a problem are:

- Novelty (avoid unnecessary duplication)
- Importance for the field
- Interest intellectual curiosity
- Training and personal qualification
- Availability of data
- Special equipment and working conditions
- Approachability of the sample
- Sponsorship and admin cooperation
- Cost and return
- Time factor

Topic-019: Defining a Problem

Reaching to the core of a problem

- Need to define a research problem
While defining a research problem, keep in mind that a research problem:
 - Sets the directions for the research
 - Reveals the methodology
 - Controls subjectivity
 - Specifies variables
 - Makes research work practicable
- Precautions to be taken in defining a research problem
 - Specific words
 - Brief but comprehensive
 - Assumptions recognized
 - Practical importance
 - Certain rationale
- Steps involved in making a research problem
 - Define the problem
 - Set the conceptual framework
 - Delimit the elements
 - Specify the elements
 - Key points

Topic-020: Statement of a Problem

A problem statement is the description of an issue currently existing which needs to be addressed. It provides the context for the research study and generates the questions which the research aims to answer.

Delimiting the task and isolating specific problem

Three criteria for a good problem statement

- Concerned with variables involved
- Clear and unambiguous
- Amenable to empirical testing

Lesson-05**FOUNDATION OF A HYPOTHESIS****Topic-021: Foundation of a Hypothesis****Formulation of a hypothesis**

Second step in research

- After the development of research problem a tentative solution of a problem is devised.
- This tentative solution is formulated in the beginning.
- We can call it a presumptive statement of a proposition.
- It is a brilliant guess about the solution and temporarily accepted as true.

Topic-022: Assumption, Postulate and Hypothesis

There are specific terms in research literature that are important to know for a researcher.

- Assumptions
 - An assumption is a realistic expectation which is something that we believe to be true. However, no adequate evidence exists to support this belief. In other words, an assumption is an act of faith which does not have empirical evidence to support. Assumption provides a basis to develop theories & research instrument & therefore, influence the development & implementation of research process.
- Postulates
 - The scientific research method is based on certain basic postulates.
- Hypotheses
 - A hypothesis is a tentative statement about the relationship between two or more variables. It is a specific, testable prediction about what you expect to happen in a study.

All the above terms need to be distinguished in research process. There should be appropriate examples and analogies given in the research study and further elaborated in the work.

Characteristics of Assumptions

- Taking things for granted
- Restrictive conditions
- On logical insight
- Truthfulness observed

Characteristics of Postulates

- Working beliefs of most scientific activity
- Not proven – simply accepted at face value
- For starting working
- Discovery of other things

Characteristics of Hypothesis

- Differs from both assumption and postulates
- Presumptive statement of a proposition
- Suggested solution
- Subject to verification
- Basis for research study to be proved or otherwise
- Hypothesis testing -as an activity

Topic-023: Functions and Importance of a Hypothesis**Functions of a hypothesis**

- Temporary solution
- Offers a basis for study
- May lead to formulate more hypotheses
- Preliminary and final
- Maybe objectively tested
- Delimiting the field-sensitizing the researcher
- Means for collecting data

Importance of a hypothesis

- Eyes of investigator
- Focused research
- Clear and specific goals
- Linking together
- Guiding light
- Direction to research
- Greater clarity
- Stimulating further research

Topic-024: Kinds of a Hypothesis**Hypotheses vary in form and function**

Basically of two types:

- Relational
- Causal

Further types:

- Directional
- Null (ND)
- With different names (simple/complex/alternative/statistical/logical)
- Declarative
- Question

Null (ND) Zero Hypothesis

- Assertion that NO relation exists

- Statistical (testable)
- Probability framework
- More in education and psychology
- Significance (accept/reject)

Directional Hypothesis

- Expected direction
- Specific direction

Declarative Hypothesis

- Anticipated relationship
- Existing evidence examined

Question Hypothesis

- NO general consensus
- Simplest level of empirical evidence
- Question may or may not qualify as a hypothesis

Topic-025: Characteristics of a Good Hypothesis

In agreement with the observed facts, a good hypothesis should contain following characteristics:

- No conflict with universal laws
- Simplest possible form
- Permits deductive reasoning
- Clear verbalization
- Effective use of tools/tech
- Controls for verification
- Ensuring approachable sample
- Indicating clear roles for variables
- Keeping distinction among:
 - Theory
 - Law
 - Facts
 - Assumption
 - postulate

Lesson-06**RESEARCH VARIABLES****Topic-026: Variables in a Hypothesis**

A variable is anything that has a quantity or quality that varies. A hypothesis is made testable by operational definitions of variables and terms.

Characteristics of Variables

- Variable – takes diff value
- Increase/decrease over time

Types of variables

- Independent
- Dependent
- Moderator – control – intervening

Variables in a hypothesis

- Operational definitions of the terms involved in a hypothesis
- Any misleading thing present in the hypothesis is defined
- Enabling to limit the meaning according to the area discussed in the hypothesis
- Specific definitions are mentioned
- Ensuring clarity of the statement
- Stick to it

Topic-027: Types of Variables

- Independent Variable
 - Provides a stimulus or gives an input
 - Measured/manipulated/selected
 - The cause of change
 - Always interested in affecting others
- Dependent Variable
 - Responsible for the response/output
 - Observed to effect
- Moderator
 - Special type of independent variable
 - Secondary independent variable
 - Modifying the relation
- Control Variable
 - A control variable in scientific experimentation is an experimental element which is constant and unchanged throughout the course of the investigation.

- Neutralized
- Factors controlled
- Intervening Variable
 - An intervening variable is a hypothetical variable used to explain causal links between other variables. Intervening variables cannot be observed in an experiment (that's why they are hypothetical).
 - All Vs can't be seen/measured/manipulated

Example:

Among students of the same age and intelligence, skill performance is directly related to the number of practice traits particularly among boys but less directly among girls.

IV: Number of practice traits

DV: Skill performance

MD: Sex

CV: Age, intelligence

IntV: Learning

Topic-028: Research Variables Combined

Variables interact among themselves. Independent, moderator and control variables interact with each other. It is in researcher's control; at least one independent variable and dependent variable in a hypothesis do interact. Intervening, extraneous and contaminating variables may interact also (Extraneous variables – These are all variables, which are not the independent variable, but could affect the results of the experiment.)

Example:

Among students of the same age and intelligence, skill performance is directly related to the number of practice traits particularly among boys but less directly among girls.

IV: Number of practice traits

DV: Skill performance

MD: Sex

CV: Age, intelligence

IntV: Learning (not stated)

Lesson-07**HOW TO LOCATE RESEARCH?****Topic-029: (HTLR) How to Locate Research?****Generating Research Questions and answers**

To create research questions and answers we need to find research studies and then provide potential answers to research questions. For this purpose, a researcher can look for published primary research. There are different sources to find primary research such as;

- Educational index
- MLA/APA
- ERIC

Preliminary sources are:

- Educational Index
- MLA/APA
- CIJE
- SSI (Social Sci. Index)
- ERIC/RIE

Secondary sources can be:

- Literature reviews/position papers/books
- Tables of references/bibliographies

Topic-030: Searching Answers for Your Questions**Looking for your questions**

If you are looking for answering research questions, there are some distinct search techniques in which firstly we delimit the area, and then search for it by doing advanced search. One can use delimiter (a character that marks the beginning or end of a unit of data) for advanced search. Use of specific keywords would be essential in searching for research questions. Also, read the input and results of the works for locating issues in them.

- ERIC
 - ERIC is an online library of education research and information, sponsored by the Institute of Education Sciences (IES) of the U.S. Department of Education.
 - Website to visit ERIC: www.eric.ed.gov
 - What you're interested in? On ERIC, you need to mention your area of interest and then search for it to get your desired results.
 - Keywords: Before starting searching, one should know the keywords. For instance, the question in your mind is, "What is the relationship between anxiety and language learning?"
 - Keywords for it will be: Anxiety and language learning
 - Jstor and google scholar are also useful resources to search

Topic-031: HTLR: Where to Look and What to Look For?**Main goal of primary research**

Primary research Primary research is new research, carried out to answer specific issues or questions. It can involve questionnaires, surveys or interviews with individuals or small groups. It is a way to test proposed answers to research questions. There are overwhelming publications, PCs and internet that can help in conducting primary research. We can easily find what and where to look for? Now one can perform the work of hours and days work in minutes.

- PCs and Internet
 - Not going to libraries
 - Not writing
 - Not carrying books
 - Gigantic indexes
 - Looking for materials
 - Just clicking buttons
- Primary research
 - Preliminary sources
 - Secondary sources
 - Tables of References Bibliographies

Topic-032: HTLR: Preliminary Sources**Experts prepared sources**

The resource materials that come from experts can help us find research. Similarly, publications also lead us to primary research. Then there are electronic databases such as;

- Storehouses
- CD – Rom
- University library
- HEC/other digital resources

Keywords are also helpful as a preliminary source. Other modes to explore are:

- Educational index
- MLA/APA
- ERIC
- CIJE
- SSI (Social Sci. Index)

Topic-033: HTLR: Secondary Sources

Secondary sources are the references and summaries; at this point primary research is accessed through the eyes of someone other the actual researchers (who did it)

Valuable places to find reference to primary researches

- Literature reviews
 - Existing literature summarized
 - Viewed and reviewed
- Position papers
 - Similar to literature reviews
 - Concepts expressed
- Books
- Tables of references and bibliographies

Lesson-08**LOCATING PRIMARY RESEARCH****Topic-034: (LPR) Locating Primary Research: Exploring Databases****Experts prepare sources to find research**

Preliminary sources that experts prepare are found in bound copies in libraries furthermore, databases like educational index, MLA/APA, ERIC/RIE, CIJE/LLBA/EI and SSI (Social Sci. Index) are also available to find research.

Databases organize topics by a set of keywords and have a focus of studies. They are all available on CDs/Databases, academic search premier, PsychInfo, Sociological abstracts, JSTOR (1800s) and www.eric.ed.gov.

Topic-035: LPR II: Examples

Use the following options for locating primary research:

- ERIC
- www.eric.ed.gov
- JSTOR
- Google Scholar

Topic-036: LPR: Position Papers vs Primary Research**Position papers**

A position paper is a written report outlining someone's attitude or intentions regarding a particular matter. It is similar to literature review. Writers argue their positions on various issues. Primary research is not included. It is used for proposing answers to research questions. It helps in generating hypothesis.

- Avoid the trap of circular reasoning
 - Generating hypothesis is okay
 - Supporting and justifying is NOT
- Position papers cannot be a substitute to you for literature review, it contains:
 - Witnessing of your own eyes
 - Focused summaries

Topic-037: LPR: Tables of References and Bibliographies**Locating primary research**

To locate primary research, one should follow the following studies:

- Profitable places to find research studies
- Benchmark studies

- Studies with sparking interest of the area
- Particular issues
- Directional change regarding the area
- Use Seminal studies
- Use Tactics
 - Identify the frequency of citation
 - Important in the history of the area
 - Area of investigation
 - Go to Google scholar

Topic-038: LPR: Difference Between Primary & Secondary Sources

Primary vs secondary sources

- Primary research is the only way to find answers
- Not all primary research is equally important
- TWO criteria
 - Refereed (pass a matter to (a higher body) for a decision)
 - Blind review (This means that the reviewers of the paper won't get to know the identity of the author(s), and the author(s) won't get to know the identity of the reviewer.)

Distinguishing primary research from position papers

Primary research and position papers are different in following aspects:

- From title
- Terms and techniques
- Must be known to active researchers

Lesson-09**Exploring primary research in ELT****Topic-039: Obtaining ELT Related Research Articles****Obtaining research articles**

Research articles can be obtained from following sources:

- University library
- Interlibrary loans
- Databases for small charges
- HEC digital library
- JSTOR – Google Scholar
- TESOL specific resources

Topic-040: Journals Related to ELT Research**Applied linguistics (ELT) resources**

Many research journals are available to consult for ELT research such as:

- TESOL
- AAAL
- IATEFL
- AERA
- ESP journal

Topic-041: Exploring ELT Research Journals

- TESOL – AAAL – IATEFL
- AERA – ESP journals
- Pakistani journals
- Specific journals
- Appendix C of your course book

Lesson-10**UNDERSTANDING WHERE DATA COME FROM?****Topic-042: Sampling Terminology****Population and sample**

Population - the entire mass of observation (the universe). All the members of the group /objects are generalized as population. It is impossible to access all the population. Sample is the data drawn to test hypothesis. A sample can be a subject/informant/participant or one or more cases like case/inanimate objects (corpora/newspapers).

Examples of samples:

- Su (2001) 122 Chinese/English NSs
- Borg (1998) 1 teacher

Sample is where the data come from. It is the data source to answer research questions. Sample contains the characteristics of a specific group. Various attributes and features are studied through sample.

Topic-043: Sampling Paradigms

Basically, there are two sampling paradigms, depending upon the nature and purpose of the study.

1. Information rich paradigm
2. Representative sampling paradigm

Information rich paradigm

- Uncover the information
- It requires in-depth analysis
- Mainly in qualitative research
- Views – feelings – holistic small sample size
- Less generalizable

Representative sampling paradigm

- Replica of a larger group
- Generalizable
- Large samples (Questionnaire etc.)

Topic-044: The Information-Rich Paradigm**Qualitative sampling**

- Maximizing information
- Small sample size (1 to large)
- Emphasis on the quality of information
- NOT generalizing
- Borg (1998) took one teacher as a sample

Two guidelines

1. Very good example of the small sample
 - Borg (1998) took one teacher
2. Examples of large samples
 - Guardado (2002) six families
 - Spanish children in Canada

Topic-045: Representative Sampling Paradigm

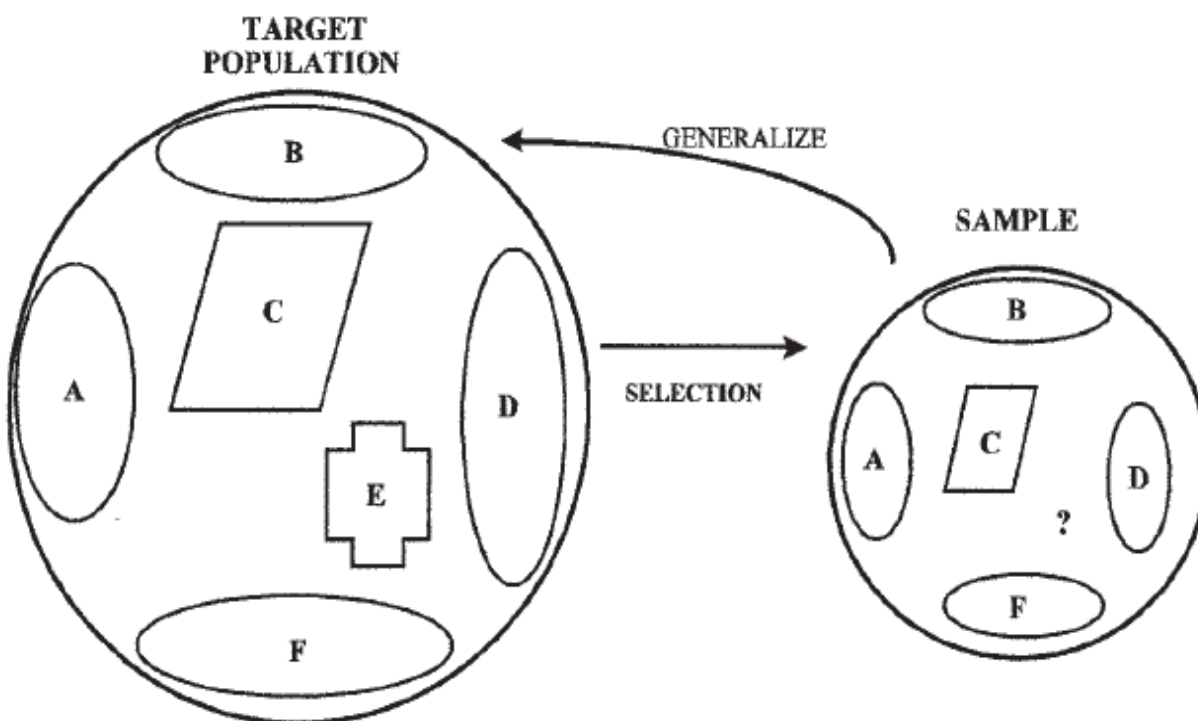
Sample as true representatives

Goal of sampling is to generalize the findings. Access to whole population is impossible.

For example

“EFL learners of English as students of English medium universities”

In the above given case, it is impossible to take the whole population to study larger populations however, the more sample size– the better it would be (the rule of game). It should highlight the important features. The attributes of the population must be found in the selected samples.



Topic-046: Ethics in Sampling of Human Participants

Several ethical issues related to human participants

Protection of the rights and privacy of human beings is a matter of serious concern in research. US commission in 1974 and Belmont Report 1979 devised ethics for taking humans as sample. Some organizations work for the regulation of human participants' protection.

Researchers should know the rights and exemptions before sampling. These type of issues can be avoided through reading and discussing, taking the informed consent with study staff, answering any questions, voluntary participation, taking all sorts of information and also knowing about the study's

procedures, risks and benefits. There can be exemptions (in some cases) like educational/public behaviour or public benefit/service.

Lesson-11**RESEARCH PLANNING AND SAMPLING****Topic-047: Research Planning and Sampling****Crucial step in social studies research**

Mapping strategy and sampling techniques are crucial step in social studies research. Sampling procedure consists of making choices while answering your research questions. The researchers need to select mandatory design components. Firstly, to select a population, secondly, go for true sampling and then choose suitable techniques and procedures. Design components are based on class of enquiry and the model to be utilized.

Following are the components and steps involved in research planning:

- Devise research objectives and sampling
- Research strategy + tools and techniques
- Analyzing data
- Reporting the results
- Selecting qualitative & quantitative procedures
- A valid and reliable research design must be selected

Topic-048: Meaning and Definition of Sampling**Sampling as an indispensable technique**

- A portion of a larger population
- Research is impossible without sampling
- Total population is impossible to be selected
- Limitations of time, energy, money are considered
- Research design is based on sampling
 - Economical
 - Accurate
- Fundamental to all statistical methods
- Sample should contain maximum information about population
- Generalizability of research data is drawn from it

Topic-049: Sampling Techniques

There are a lot of sampling techniques which are grouped into two categories as

Probability Sampling

Non- Probability Sampling

Probability Sampling

This Sampling technique uses randomization to make sure that every element of the population gets an equal chance to be part of the selected sample. It's alternatively known as random sampling.

Simple Random Sampling

Stratified sampling

Systematic sampling

Cluster Sampling

Multi stage Sampling

Non-Probability Sampling

It does not rely on randomization. This technique is more reliant on the researcher's ability to select elements for a sample. Outcome of sampling might be biased and makes difficult for all the elements of population to be part of the sample equally. This type of sampling is also known as non-random sampling.

Convenience Sampling

Purposive Sampling

Quota Sampling

Referral /Snowball Sampling

Topic-050: Sampling Designs

A sample design is made up of two elements.

Sampling method

Sampling method refers to the rules and procedures by which some elements of the population are included in the sample. Some common sampling methods are simple random sampling, stratified sampling, and cluster sampling.

Estimator

The estimation process for calculating sample statistics is called the estimator. Different sampling methods may use different estimators. For example, the formula for computing a mean score with a simple random sample is different from the formula for computing a mean score with a stratified sample. Similarly, the formula for the standard error may vary from one sampling method to the next.

The "best" sample design depends on survey objectives and on survey resources. For example, a researcher might select the most economical design that provides a desired level of precision. Or, if the budget is limited, a researcher might choose the design that provides the greatest precision without going over budget.

Topic-051: Characteristics of Good Sampling

True representative of the population

A sample should be a true representative of the population.

Characteristics of a sample:

- Free from bias
- Objective
- Maintains accuracy
- Comprehensive in nature
- Economical
- Approachable
- Sample size
- Makes work more feasible
- Practicability
- Having maximum possible features and attributes of the population
- Free from errors

Lesson-12**AVOIDING ERRORS IN SAMPLING****Topic-052: Avoiding Errors in Sampling****Sample is not always representative**

A sample is not necessarily always a true representative of population. There can be errors occurred in sampling. Two types of errors:

- Random error
- systematic error

Sampling errors and errors of measurement

- Four ways of classification (random – constant / sampling –measurement)
- Can be avoided through solid sampling design, large sample and multiple contacts

Topic-053: Avoiding Errors: Size of Sample**Sample size – crucial problem**

By carefully choosing the sample size can avoid sampling errors. Sampling size depends upon total no. of subjects/ participants present and precision of the research. Before selecting the sample size we estimate the population parameter, there is no single rule for it. The researcher should try to reach as large as a sample as possible.

For example, 30 n= in each group of population. Larger the sample – the smaller would be the standard error. Sample should cover 10-20 % of the population. Usually in descriptive research, larger size samples are taken. In pure experimental studies, different groups of equal sizes are preferred as sample units.

Topic-054: Internal Validity**Avoiding errors in sampling: internal validity**

Internal validity refers to how well an experiment is done, especially whether it avoids confounding (more than one possible independent variables acting at the same time). The less chance for confounding in a study, the higher its internal validity is.

Therefore, internal validity refers to how well a piece of research allows you to choose among alternate explanations of something. A research study with high internal validity lets you choose one explanation over another with a lot of confidence, because it avoids (many possible) confounds.

There are two types of validity. Validity determines that how sound is your research design? Internal validity is critically very important. Internal validity is concerned with the effects observed in the dependent variables are only due to independent variables. It also defines the causal relationship between independent variables and dependent variables.

Extraneous variables affect the internal validity because they are not controlled and have lower internal validity. Very difficult/impossible to replicate the extraneous variables also, cannot check the reliability of findings.

Credibility of sampling in Qualitative research methods

- Hard to avoid selection biasness
- Maturation is required
- Sample size matters
- Careful instrumentation
- Confounding
- Testing method
- History
- Attrition

Topic-055: External Validity

Avoiding errors in sampling: external validity

External validity refers to how well data and theories from one setting apply to another. This question is usually asked about laboratory research: Does it apply in the everyday "real" world outside the lab?

External validity determines the degree of generalizability. Can the findings of the study be generalized to the whole population? External and internal are not limited of each other. It depends upon transferability to situation.

Threats to external validity

- Participant characteristics should be studied keenly
 - True representative
 - Does the sample have all the characteristics of the population
- Relating to the setting of the study
 - Relate to the real world
- Timing of the study
 - Realistic

Lesson-13**CLASSIFYING RESEARCH DESIGNS****Topic-058: Classifying Research Designs****Research design: overall plan**

Research design is the blue print of your study, there can be more than one possibilities in selecting research design for the study. The step wise study framework is given below:

Problems (Variables) → Research Questions → population → sample → Research Designs

We have to choose a specific type of research design that can be selected from the following:

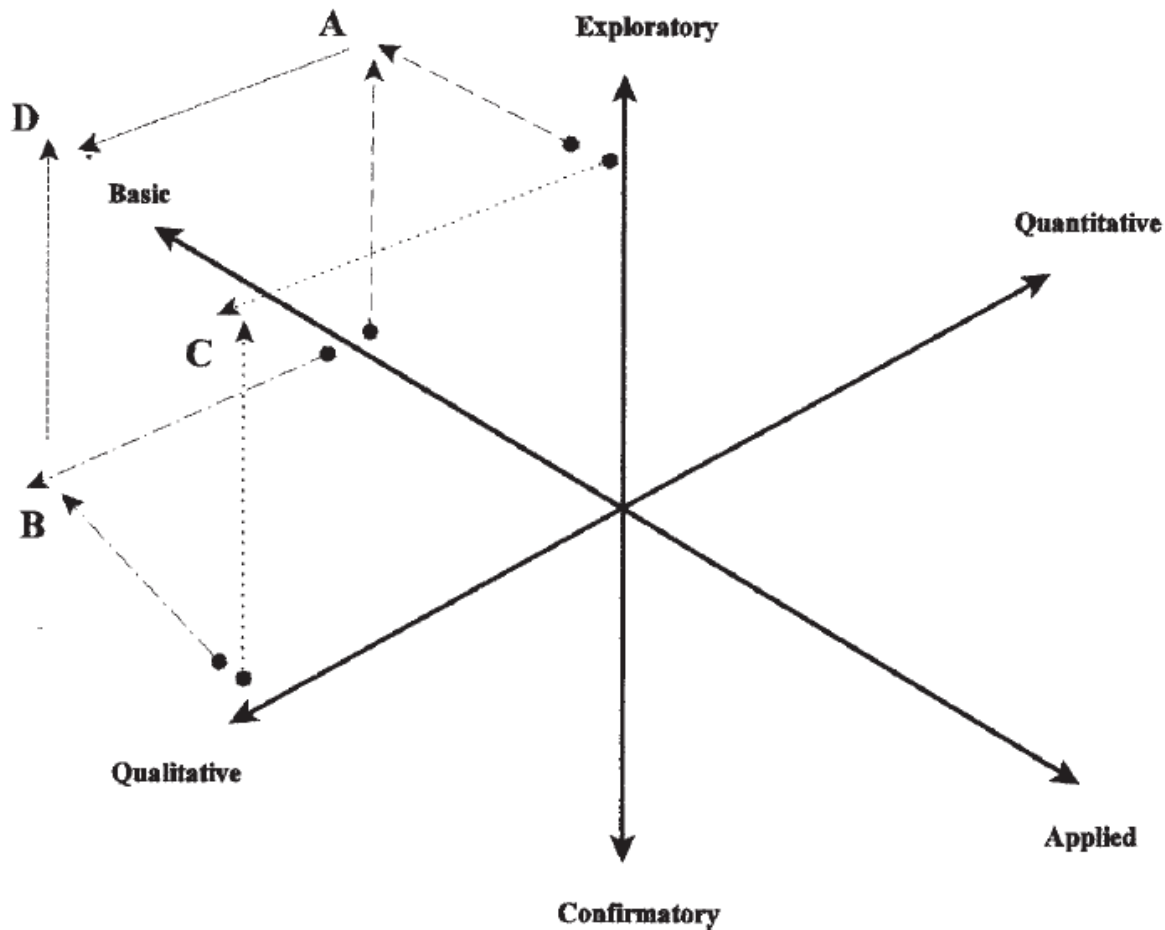
- Basic-Applied
- Qualitative – quantitative
- Exploratory – confirmatory

Characteristics of a Research Design

- Research design must be the plan that can guide the strongest plan for your research.
- Research design should be the most efficient structure to provide data for your study.
- Research designs must be the most useful plan to answer research questions.
- A poor research design is a house full of problems.
- Mapping strategy through critical planning can help for a systematic research process.

Topic-059: CRD: Three Continua**Three continua to classifying research designs**

- Basic - Applied
- Qualitative – quantitative
- Exploratory – confirmatory



Topic-060: CRD: Three Continua

Classifying research designs: the basic-applied continuum

Basic Research or otherwise called as pure or fundamental research, is one that focuses on advancing scientific knowledge for the complete understanding of a topic or certain natural phenomenon, primarily in natural sciences. In a nutshell, when knowledge is acquired for the sake of knowledge it is called basic research.

Basic Research is completely theoretical, that focuses on basic principles and testing theories. It tends to understand the basic law.

Basic Research deals with generalization and formulation of theory about human behaviour. It is aligned towards collecting information that has universal applicability. Therefore, basic research helps in adding new knowledge to the already existing knowledge.

Characteristics:

- Highly theoretical
- Hypothetical
- No immediate value

- Broader studies

Applied research

Applied Research can be defined as research that encompasses real life application of the natural science. It is directed towards providing a solution to the specific practical problems and develop innovative technology.

In finer terms, it is the research that can be applied to real-life situations. It studies a particular set of circumstances, so as to relate the results to its corresponding circumstances.

Applied research includes research that focuses on certain conclusions experiencing a business problem. Moreover, research that is aligned towards ascertaining social, economic or political trends are also termed as applied research.

Characteristics:

- Action research
- Solving problems
- Very practical

Comparison Chart

Basis for Comparison	Basic Research	Applied Research
Meaning	Basic Research refers to the study that is aimed at expanding the existing base of scientific knowledge.	Applied Research is the research that is designed to solve specific practical problems or answer certain questions.
Nature	Theoretical	Practical
Utility	Universal	Limited
Concerned with	Developing scientific knowledge and predictions	Development of technology and technique
Goal	To add some knowledge to the existing one.	To find out solution for the problem at hand.

Topic-061: CRD: The Qualitative - Quantitative Continuum

The qualitative - quantitative continuum is the center of focus (last 30 years). They were two schools of thoughts initially depending upon different data collection procedures. Quantitative and qualitative are two ends of a continuum having separate designs and methodologies.

Quantitative data collection

Quantitative research is a form of research that relies on the methods of natural sciences, which produces numerical data and hard facts. It aims at establishing cause and effect relationship between two variables by using mathematical, computational and statistical methods. The research is also known as empirical research as it can be accurately and precisely measured.

Characteristics:

- Psychology
- Statistics (generalize)
- To larger populations
- Large scale researches

Qualitative data collection

Qualitative research is used to gain an in-depth understanding of human behaviour, experience, attitudes, intentions, and motivations, on the basis of observation and interpretation, to find out the way people think and feel. It is a form of research in which the researcher gives more weight to the views of the participants. Case study, grounded theory, ethnography, historical and phenomenology are the types of qualitative research.

Characteristics:

- Anthropological – Sociological research
- Verbal description
- Uncover information-rich
- Natural setting
- Concentrated contact
- Patterns-comparisons-contrast

Topic-062: CRD: The Exploratory - Confirmatory Continuum

Confirmatory Research:

Confirmatory research is where researchers have a pretty good idea of what's going on. That is, researcher has a theory (or several theories), and the objective is to find out if the theory is supported by the facts.

- Confirming something
- Whether the study is going to find evidence
- Supporting a hypothesis
- To confirm

Exploratory Research:

An exploratory design is conducted about a research problem when there are few or no earlier studies to refer to or rely upon to predict an outcome. The focus is on gaining insights and familiarity for later investigation or undertaken when research problems are in a preliminary stage of investigation. Exploratory designs are often used to establish an understanding of how best to proceed in studying an issue or what methodology would effectively apply to gathering information about the issue.

Characteristics:

- Exploring a phenomenon
- Prior to developing a Ho
- Doesn't test a hypothesis
- What is happening?

Lesson-14

QUESTIONS AND RESEARCH DESIGNS**Topic-063: Questions and Research Designs****Research Questions – basic determining points**

- Research designs are based on your research questions
- Understanding your research designs in the light of your research questions
- Gathering – analyzing and concluding data
- Two generic questions are asked in the process:
 - What?
 - Why?
- Examples of ‘What questions’:
 - What phenomena are important?
 - What simple relationships exist between phenomena?
- Examples of ‘Why questions’:
 - Why do some people learn languages better than others?
 - Why do certain variables relate with one another?

Topic-064: Q&D: The WHAT Questions**Characteristics**

- Explain phenomenon
- Describe nature
- Description of philosophy
- State function(s)
- For example
 - What is important about it?
 - What relationship exists?
 - What is phonological memory
 - What is influence of bilingualism
- Information not known previously
- No hypothesis to confirm
- Studies mainly based on what questions are primarily exploratory
- Could be both quantitative and qualitative or basic and applied

Topic-065: Q&D: The WHAT Questions (Examples)

- What phenomena are important?
- What simple relationships exist between phenomena?

- About personal experiences of ethnic and language of pre-service teachers
 - It can be studied through following given research designs:
 - Qualitative
 - Exploratory
 - Applied
- What simple relationships exist between phenomena?
- The relationship among previous knowledge, topic interest and L2 reading (Carrel & Wise, 1998)
 - It can be studied through following given research designs:
 - Quantitative
 - Exploratory
 - Applied
- Influence of bilingualism on learning a third language (Sanz, 2000)
 - It can be studied through following given research designs:
 - Quantitative
 - Exploratory
 - Basic

Topic-066: Q&D: The WHY Questions

- After WHAT (Phenomenon + Relation) between variables, ‘Why questions’ asked
- Why questions show causation
- Discovering why independent variable affect dependent (at least one)
- Used in
 - Causal studies
 - Relationships and correlations
 - Causal comparative studies
 - Experimental and quasi experimental
 - Exploratory – Confirmatory
 - Could be both quantitative and qualitative
 - Basic and applied

Topic-067: Q&D: The WHY Questions (Examples)

Why Qs and their examples

- Why some variables influence others?
- Why simple relationships exist between phenomena?
- For example: Kobayashi (2002) studied;
 - Method Effects on Reading Comprehension Test Performance: Text Organization and Response Format.
- Show causation (one or more relationships)
- Other terms: impact, influence, improve, change, role of:
 - Qualitative - quantitative

-
- Exploratory - confirmatory
 - Applied - basic
 - Causal Qualitative Studies
 - (Wesche & Paribakht, 2000), Why a particular enhanced reading method works better than reading only for learning vocab?
 - Qualitative-exploratory-applied studies
 - Causal-Comparative Designs (effect, impact, influence)
 - Experimental and Quasi-Experimental Designs

Lesson-15

Q&RD: EXTRANEIOUS FACTORS TO AVOID**Topic-068: Q&RD: Extraneous Factors to Avoid****Internal and external validity**

Any variable that you are not intentionally studying in your dissertation is an extraneous variable that could threaten the internal validity of your results. We try and control these extraneous variables so that they do not become confounding variables. When an extraneous variable changes systematically along with the variables that you are studying, this is called a confounding variable.

Extraneous factors are research minefield. Extraneous factors may contaminate your data affecting internal as well as external validity as internal and external are not mutually exclusive. If the results (in DV) are not only due to IV – it's not generalizable.

Topic-069: EFTA: History & Maturation

- The factor of history includes events taking place at different points in time.
- Longitudinal studies are more vulnerable and may be affected by such factors.
- Studies on the basis of natural changes (society) and physical changes (personality) may influence the results of the study

History as extraneous factor

- External events (pre-test/post-test) may influence the results

Maturation (internal) factor (natural process)

- Physical - emotional -cognitive structures
- For example:
 - L2 of young learners using methods
 - Independent Variable (Teaching Method) – Dependent Variable (Imp L2)

Topic-070: EFTA: Control Group Contamination**Control group in studies**

- Experimental group is treated differently
- Control group may influence the results because the treatment
- Control group may influence in four directions
 1. Control group rivalry (John Henry effect)
 - Trying to outdo the Target Group
 - When explicitly labelled as Control Group
 - Group identities secret
 2. Experimental treatment diffusion (Compromise)
 - Treatment conditions
 - In close proximity
 - Possibility to discuss the kind of treatment

3. Compensatory equalization of treatments
 - Extra material or special treatment (Control Group)
 - Difference of Control Group and Experimental Group distorted
4. Demoralization (boycott) of the control group
 - Potential contaminator
 - Special treatment of Experimental Group – lower their performance

Topic-071: EFTA: Testing

Five ways the results may be spoiled

1. Instrumentation
 - Diff instruments used
 - Pre (MCQs) Post (essay)
 - For English proficiency
 - Parallel testing
2. Measurement–treatment interaction
 - Same instrument for all types of variables
 - Teaching grammar in an EFL (MCQs – not Essay type)
3. The pretest effect
 - Awareness of material
 - Another group
4. The posttest effect
 - The click of comprehension effect
 - When oral interview
5. Time of measurement effect
 - Immediate testing
 - But results are not lasting
 - Idea about long term effects is misleading
 - To control this effect
 - Test after a week or so without warning

Topic-072: EFTA: Avoiding Various Factors

Ways in measuring DV (s) distort the study results

- Pygmalion effect
 - Researcher's effect – perception of participant's behavior
- Hawthorne effect
 - Participants behave differently
 - Being aware of their participation
- Treatment intervention
 - Novelty and disruption
- Accumulative treatment effect

- Several treatments
 - Counter balanced designs
- Treatment fidelity
 - In correct manner?
- Treatment strength–time interaction
 - Time for noticeable effect
 - Teaching methodology

Lesson-16**DATA COLLECTION PROCEDURES****Topic-073: Data Collection Procedures****Who and what is used to collect data?**

- Once research designs are decided, we need to select the data collection procedure.
- There are many ways for data collection
- The value of data collection procedure is how well it provides answers to the research questions
- Commonly used data collection procedure in applied linguistics:
 - Observational and instrumental
- Observational DGP
 - Participant observation
 - Non-participant observation
 - Sheets
 - Judges - raters
- Instrumental DGP
 - Questionnaires
 - Closed-open
 - Tests

Topic-074: DCP: Observational Procedures**Data gathering procedures based on observation**

- Many possibilities
- Self (intro-retro)
- Others – participant (full-non- partial)
- Interviewers
- Judges-raters

Data-Collection Procedures

<i>Method</i>	<i>Potential Strengths</i>	<i>Potential Weaknesses</i>
Observational procedures	Discover new phenomena, flexible	Time-consuming, observer effects
Self	Firsthand information, inner thoughts	Possible bias
Introspection	Immediate access, accesses inner states	Intrusive, difficult to validate
Retrospection	Not intrusive	Memory loss
Outside observer		
Full participant	Elicits natural behavior, not intrusive	Possible bias, deceptive, memory loss
Partial participant	Not deceptive	Possible bias
Nonparticipant	Objective	Disruptive
Interviewer	Ability to probe, monitors comprehension, 100% feedback	Needs training, standardization, handling data
Judges/raters	Expert opinion	Subjectivity, fatigue, halo effect, ambiguous rubrics

Topic-075: DCP: Observational Procedures-Examples**Data gathering procedures based on observation**

- Through visual observation
- Human observation for data gathering
- Self as observer - using participants as observers of their own behavior
- Protocol analysis (their own internal cognitive states – introspection/retrospection)
- Outside observers -others are observing
 - Full participants
 - Partial participants
 - Non-participants
 - Ethnographic studies – conversational analysis
- The interviewer
 - Observation under highly structured conditions
 - Paper-and-pencil data recording
 - Structured-semi-un-

Topic-076: DCP: Instrumental Procedures**Data gathering procedures based on instrumentation**

- Many possibilities

- Questionnaires
- Closed - form
- Open - form
- Tests
- Discrete items
- Constructed response

Instrumental procedures	Large coverage, time-efficient	Inflexible
Questionnaires		
Closed-form	Objective, broad coverage, easy to interpret	Restrictive, low returns
Open-ended	Information revealing	Subjective
Tests		
Discrete item	Objective scoring, broad coverage, easy to score	Guessing, difficult to construct
Constructed response	Allows for individuality, limits guessing	Limited coverage, subjective scoring, training of scorers

Topic-077: DCP: Instrumental Procedures -Examples

Data gathering procedures based on instrumentation

- Range of devices – questionnaire s- tests
- Maximum participants
- Very economical ways
- Surveys – open and closed
- Standardized tests
- TOEFL (ETS) – IELTS (UoC)
- Questionnaires
 - Yes-No Qs
 - Agree-disagree Qs

- Likert scale
- Examples:
 - First Certificate in English (FCE)
 - Comprehensive English Language Test (CELT)
 - McArthur Communicative Development Inventory (CDI)
 - Norm-referenced and criterion-referenced tests