**Lesson Two: Quantitative versus Qualitative Research**

One of the most ways to classify research is by categorizing them according to the data gathered and analyzed. According to the data gathered, research can be classified into two kinds: quantitative and qualitative.

1. **Definitions**

**Qualitative research** follows the exploratory scientific method. It is used to describe what is seen locally and sometimes to come up with or generate new hypotheses and theories. It is used when little is known about a topic or phenomenon and when one wants to discover or learn more about it. It is commonly used to understand people’s experiences and to express their perspectives (Johnson & Christensen, 2014).

In the domain of languages, researchers use qualitative methods to investigate how language teaching and language learning take place in the complexity of their natural settings. They may explore the process of language teaching and language learning as these occur in the classroom, the home, or the community. Qualitative methods, by definition, feature qualitative data—the researcher's description of what participants do or say about themselves and their activities in an educational setting.

Researchers using qualitative methods not only make their own interpretation about what they see and hear, they frequently explore what the language learning and teaching activities mean to the participants as well (although researchers using quantitative methods may also examine this). They try to discover the participants' point of view, thoughts, and feelings and why they think, feel, or behave as they do.

According to Johnson and Christensen (2014), **Quantitative research** primarily follows the confirmatory scientific method because its focus is on hypothesis testing and theory testing. Quantitative researchers consider it to be of primary importance to state ones hypotheses and then test those hypotheses with empirical data to see if they are supported.

 Quantitative research can be conceptually divided into two types: associational and experimental. What is common in both types is that researchers are attempting to determine a relationship between or within variables. The goal of associational research is to determine whether a relationship exists between variables and, if so, the strength of that relationship. This is often tested statistically through correlations, which allow a researcher to determine how closely two variables (e.g., motivation and language ability) are related in a given population. Associational research is not concerned with causation, only with co-occurrence.

In experimental studies, researchers deliberately manipulate one or more variables (independent variables) to determine the effect on another variable (dependent variable). This manipulation is usually described as a treatment and the researcher's goal is to determine whether there is a causal relationship. Many types of experimental research involve a comparison of pretreatment and posttreatment performance.

1. **Differences between Qualitative and Quantitative Researches**

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|  | Qualitative research | Quantitative research |
| Purpose | **To understand a phenomenon or individuals** | **To generalize, to predict or so a causal relationship** |
| The research question | **On-going, dynamic and can be changed** | **Static: fixed, decided prior to collecting data**  |
| Participants | **Tend to be small number, even one person** | **Large number** |
| Length of study | **Long-term** | **Short-term** |
| Data display | **Participants’ words and stories** | **Using numerical figures, percentages and/or tables** |
| Language | **Descriptive**  | **Technical**  |
| Data analysis | **Interpretative analysis by categorizing data according to, for example, emerging themes** | **Statistical analysis** |

1. **Quantitative Research Methods**

**3.1 Important Concepts Relating to Research Design**

* **Dependent and independent variables:** the dependent variable is the variable that is presumed to be influenced by one or more independent variable(s). It is the outcome or change(s) brought about by introduction of an independent variable. The independent variable is a variable that is presumed to cause a change to occur in another variable. It is the cause supposed to be responsible for bringing about change(s) in a phenomenon or a situation.

**Extraneous variables:** Several factors operating in a real life situation may affect changes in the dependent variable. These factors, not measured in the study, may increase or decrease the magnitude or the strength of the relationship between the dependent and independent variables. Extraneous variables are independent variables that are not related to the purpose of the study, but may affect the dependent variable.

Whatever effect is noticed on dependent variable as a result of extraneous variable(s) is technically described as an ‘experimental error’.

* **Control:** one important characteristic of a good research design is to minimize the influence or effect of extraneous variable(s). The technical term ‘control’ is used when we design the study minimizing the effects of extraneous independent variables.
* **Confounded relationship:** when the dependent variable is not free from the influence of extraneous variable(s), the relationship between the dependent and independent variables is said to be confounded by an extraneous variable(s).
* **Research hypothesis:** a hypothesis is a hunch, assumption, suspicion, assertion, or an idea about a phenomenon, relationship or situation, the reality or truth of which you do not know. A researcher calls these assumptions, assertions, statements or hunches hypotheses and they become the basis of an inquiry.

It is a conjectural statement of the relationship between two or more variables.

It is a predictive statement that relates an independent variable to a dependent variable. A hypothesized relationship is tested by scientific methods. It gives clarity, specificity, and focus to the problem.

* **Experimental and control groups:** in an experimental hypothesis-testing research when a group is exposed to usual conditions, it is termed a ‘control group’, but when the group is exposed to some novel or special condition, it is termed an ‘experimental group’.
* **Treatments:** the different conditions under which experimental and control groups are put are usually referred to as ‘treatments’.

**3.2 Experimental Research**

For decades, experimental research has been a major approach used in quantitative research. When people think about research and what research is, they commonly associate it with characteristics typical of experimental research.

Experiment is the research method designed to ferret out cause-and-effect relationships. Causal relationships can be identified because experiments allow us to observe, under controlled conditions, the effect of systematically changing one or more variables, the greater the degree of control, the greater the degree of internal validity of the study and the greater our confidence in our claims about causality.

Experiments are defined as attempts to objectively observe phenomena, which are made to occur in strictly controlled situations in which one or more variables are varied and the others are kept constant(Zimmey, 1961, p. 18).

These phenomena are made to occur because we present a set of conditions to the research participants and record the effect of these conditions on their behaviour.

The observations are made in controlled situations. This means that we must eliminate the influence of confounding extraneous variables.

**3.2.1 Basic Principles of Experimental Design**

According to Kothari (p. 39), Professor Fisher has enumerated three principles of experimental design:

* **Principle of Replication:**the experiment should be repeated more than once. Thus, each treatment is applied in many experimental units instead of one. By doing so, the statistical accuracy of the experiment is increased.
* **Principle of Randomization:** this principle provides protection against the effect of extraneous factors (any variable other than the independent variable that might influence the dependent variable). Through the application of the principle of randomization, we can have a better estimate of the experimental error.
* **Principle of Local Control:** it is another important principle of experimental designs. Under it, the extraneous factor, the known source of variability, is made to vary deliberately over as wide a range as necessary and this needs to be done in such a way that the variability it causes can be measured and hence eliminated from the experimental error. Johnson and Christensen (np) claimed that “drawing clear and valid conclusions from the data you collect is impossible if an uncontrolled confounding variable is present. It is essential that you identify and control for all confounding variables that might threaten your study conclusions”.

**3.2.2 Types of Experiment Design**

There are many types of experiment design (the outline, plan, or strategy that is used to answer a research question): weak experimental research design and strong experimental design.

* **Weak experimental research design:** it does not control for many potentiality confounding extraneous variables.
* **One-group posttest-only design:** administering a posttest to a single group of participants after they have been given an experimental treatment condition.
* **One-group pretest-posttest design:** administering a posttest to a single group of participants after they have been pretested and given an experimental treatment condition.
* **Posttest-only design with nonequivalent groups:** comparing posttest performance of a group of participants who have been given an experimental treatment condition with that of a group that has not been given the experimental treatment condition.
* **Strong experimental design:** it is in which the influence of confounding extraneous variables has been controlled. All strong experimental designs include at least two comparison groups: the experiment group that receives the experimental treatment condition. The control group is the group that does not receive the experimental treatment condition.
* **Pretest-posttest control group design:** in it, a group of research participants is randomly assigned to an experiment or a control group and is pretested on the dependent variable, O. Next, the independent variable, X, is administered and, last the experimental and control groups are posttested on the dependent variable O.
* **Posttest-only control-group design:** research design in which a posttest is administered to two randomly assigned groups of participants after one group has been administered the experimental treatment condition.
* **Factorial Designs:** A factorial design involves more than one independent variable and can occur with or without randomization. It is a strong experimental design in which two or more independent variables, at least one of which is manipulated, are simultaneously studied to determine their independent and interactive effects on the dependent variable. In other words, factorial studies are useful for understanding not only the main effects of each independent variable but also how they interact with each other to influence the dependent variable.

In education research, we are often interested in the effect of several independent variables acting in concert. Most variables of significance to educators do not act independently. For example, assume that you want to identify the most effective method for improving students’ vocabulary retention. You can design a factorial study with two independent variables:

* + - * Teaching methods:
1. factor one: flashcards
2. factor two: mnemonics
	* + - Study time
3. Factor three: short (15 minutes)
4. Factor four: long (45 minutes)

The dependent variable in this study in vocabulary retention, measured through a posttest. You would create four different conditions to test all possible conventions of the factors:

1. Flashcards + short study time
2. Flashcards + long study time
3. Mnemonics + short study time
4. Mnemonics + long study time

You would then randomly assign students to these four groups and track their vocabulary retention after studying. After analysing the results, you can draw conclusions about the effectiveness of each teaching method and the impact of the study time, as well as potential interactions between these factors.

* **Quasi-experimental research Design**

It is an experimental research design that does not provide for full control of potential confounding variables primarily because it does not randomly assign participants to comparison groups. For example, assume you want to randomly assign the students to the classrooms in which the different reading techniques will be taught. Usually, it is not possible to randomly assign students to classrooms because the school year might have already begun and the school system is not willing to allow you to reassign students to classrooms. This means that you will have to conduct a study making use of existing classes of students.

1. **Qualitative Research Methods**

**4.1 Case Study Research**

It is a form of qualitative research that is focused on providing a detailed account of one or more cases.

Because case study researchers define a case as a bounded system, it should not be surprising that they study how the system operates. Almost all systems are made up of components or parts, and it is important to understand how the parts operate together in order to understand the system (i.e., the case). For example, a high school is made up of teachers, buildings, students, classrooms, and books (among many other things). You can also view an individual as being composed of many different components or parts (cognitive, emotional, psychological). Hence, cases are seen as holistic entities that have parts that act or operate in their environment.

Case study is a method of exploring and analyzing the life of a social unit - be that unit a person, a family, institution, culture group, or even an entire community. It is the intensive study of a phenomenon, but it gives subjective information rather than objective. It gives a detailed knowledge about the phenomena and not able to generalize beyond the knowledge. In physical science every unit is the true representative of the population, but in education the units may not be true representative of the population. There are individual differences as well as intra-individual differences. Therefore, prediction cannot be made on the basis of knowledge. No statistical inferences can be drawn from the exploration of a phenomenon.

Case study researchers view each case as having an internal and an external context. Take a school as an example. Internally, a researcher might examine the organizational climate at a school, the leadership style used by the principle, and the condition of the physical and instructional facilities. Externally, the school is situated in a geographical area with specific social, economic, and demographic characteristics. If the school is a public school, it is situated within a public school system with additional characteristics. The point is that case study researchers carefully examine the context of the case to describe and explain better the functioning of the case.

**Sources of Case Data**

a. Personal Documents: Diaries, autobiographies, memoirs, letters, confession, etc.

b. Life history records: it is a combination of facts and events. Life history data are generally gathered through prolonged interviews.

 c. Related Persons: Parents, neighbours, friends, teachers, etc.

d. Official Records: school records, police courts, military organizations, clubs, institutions, etc.

 d. The subject himself.

 According to Stake (1995), there are three types of case studies: intrinsic case studies, instrumental case studies, and collective case studies.

* **Intrinsic case study:**it is often used in exploratory research in which the researcher attempts to learn about a little known phenomenon by studying a single case in depth to shed light on it. Therefore, the researcher’s primary interest is understanding a specific case. For example, a researcher might want to understand a student who is having difficulty in class. The goal is to understand the case as a holistic entity, as well as to understand its inner working. A secondary goal is to understand a more general process based on an analysis of the single case. The intrinsic case study is very popular in education. It is also popular with programme evaluator, whose goal is to describe a programme and to evaluate how effectively it is operating.
* **Instrumental case study:** the researcher’s primary interest is in understanding something other than particular case. The case is seen as important only as a means to an end. In other words, the researcher studies the case to learn about something more general. (e.g., teenage drug in general rather than teenage drug use at a particular high school, or discipline in general rather than discipline in a particular teacher’s classroom). The goal tends to be less particularistic and more universalistic. In the instrumental case study design, the researcher is usually interested in how and why a phenomenon operates as it does. That is, the researcher chooses the case to develop and/or test a theory or to understand some important issue better.
* **Collective case study (multiple-case design):** the researcher believes that he or she can gain greater insight into a research topic by concurrently studying multiple cases in one overall research study. The cases in the collective case study are usually studied instrumentally rather than intrinsically. For example, a researcher might select several cases to study because he or she interested in studying the effects of inclusion of children with mild mental retardation in general education classes. Rather than studying the outcomes in a single classroom, the researcher studies the impact in several different classrooms.

There are several advantages to studying more than one case:

* First, a comparative type of study can be conducted in which several cases are compared for similarities and differences. For example, a public school might be studied and compared with a private school.
* Second, one can more effectively test a theory by observing the results from multiple cases.
* Third, one is more likely to be able to generalize the results from multiple cases than from a single case.
	1. **Narrative Inquiry**

It is commonly known that people have lived and told stories about their experiences for as long as we could talk. Narrative inquiry is a research method used in social sciences and humanities to explore and understand people’s experiences, stories, and narratives. It is a study of experience when experience is understood as lived and told stories. It involves collecting and analysing stories or narratives shared by individuals or group to gain insights into their perspectives, beliefs, values, and the meaning they attribute to their experiences. It is a collaboration between researcher and participants, over time, in a place or series of places and in social interaction with their social milieus. Narrative inquiry as a methodology entails a view of the phenomenon.

The focus of narrative inquiry is not only on an individual’s experience but also on the social, cultural, and institutional narratives within which individuals’ experiences are constituted, shaped, expressed, and enacted. Narrative inquirers study the individual’s experience in the world, an experience that is storied both in the living and telling and that can be studied by listening, observing, living alongside another, and writing, and interpreting texts.

Stories or narratives are often seen as the data collected by many qualitative researchers. People tell their stories to researchers in response to interview questions, in oral histories, in open-ended interview studies, and even in open-ended sections of questionnaires. There is usually an assumption that the stories are waiting to be told and when asked, people tell them.

In sum, narrative inquiry requires more than just telling stories. Narrative inquiry is a research approach for studying the experience of lived and told stories, such as the phenomenon of experiences of youth dropping out of school. Narrative inquiry is a way to understand human experience. In many ways, human experience is fundamentally narrative. Narrative inquiry helps us see and understand that who we are and the stories we live by are fundamentally narrative in nature. It asks us to share and publish our stories and inquiries into our stories that might enlighten or help others.