**Research and Types of Research Methodologies**

Research can be defined as “the process of collecting, analyzing, and interpreting data in order to understand a phenomenon” Leedy, P. and Ormrod, J. (2001 cited in Williams, C. 2007). Similarly according to Oxford Dictionary ‘A search or investigation directed to the discovery of some fact by careful consideration or study of a subject; a course of critical or scientific enquiry, can be called as research’. Thus, research can be argued as a systematic and well planned investigation for the purpose of exploring answers to various questions. In the same context research methodology can be defined as “the general approach the researcher takes in carrying out the research project” Leedy, P. and Ormrod, J. (2001 p.14).

Broadly, the commonly used approaches for research can be categorized into quantitative, qualitative and mixed methodologies (Williams, C. 2007). Researchers typically select the quantitative approach to respond to research questions requiring numerical data, the qualitative approach for research questions requiring textural data, and the mixed methods approach for research questions requiring both numerical and textural data”. A brief introduction of these methodologies is given below.

**Quantitative Research**

According to (Williams, C. 2007) the Quantitative research was emerged in or around 1250 A.D to facilitate researchers in the analysis through quantification of data. Since then the same has overwhelmingly dominated the western cultural as the most frequently used research pattern for the creation of meanings and new knowledge.

Creswell, J. (2003 p.18) states that quantitative research “employ strategies of inquiry such as experimental and surveys, and collect data on predetermined instruments that yield statistical data. The findings from quantitative research can be predictive, explanatory, and confirming. It involves the collection of data so that information can be quantified and subjected to statistical treatment in order to support or refute alternate knowledge claims”.

So, quantitative research techniques are used to gather data/information from different reliable sources, which deal with numbers, statistics, charts, graphs and tables etc. The quantitative research can of different natures.

Leedy, P. and Ormrod, (J. 2001) describes three broad classifications of quantitative research: descriptive, experimental and causal comparative. Descriptive research involves identification of attributes of a particular phenomenon, whereas experimental approach deals with investigation of the treatment of an intervention into study group and then measures outcomes of the treatment. In comparative approach, the researcher examines the relationships between the variables.

**Advantages and disadvantages of Quantitative research**

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| **Advantages of Quantitative Research** | **Disadvantages of Quantitative Research** |
| It is objective and can be measured so that comparisons can be made. | Findings can be biased by researchers’ perspective. Researchers must therefore try to keep a ‘distance’ from their subjects – they can use subjects unknown to them and should make no attempt to get to know their subjects other than to collect data from them. |
| Methods, if explained in detail are generally very easy to replicate and so have a high reliability. | Research often takes place in an unnatural setting – the researchers create an artificial environment in an attempt to control all relevant variables. So, how sure can they be that the results which they obtain in the laboratory will also apply in the real world? |
| Results can be reduced to a few numerical statistics and interpreted in a few short statements. | Provides narrow, unrealistic information using measures which capture only a tiny proportion of the concept originally under study. This provokes a question of whether the research actually measures what the researcher claims it does. Hence, quantitative research has a low validity. |
| It can provide information about program stakeholders who were overlooked initially. | The results of quantitative research may be statistically significant but are often humanly insignificant. ‘Some things which are numerically precise are not true; and some things which are not numerical are true.’ |
| The use of a survey instrument that collects data from all program stakeholders in the study may serve to correct the qualitative research problem of collecting data only from an elite group within the system being studies. | Uses a static and rigid approach and so employs an inflexible process. |
| Using quantitative assessment can correct for the “holistic fallacy” (the perception by the researcher that all aspects of a given situation are congruent, when in fact only those persons interviewed by the researcher may have held that particular view). Also the use of quantitative instruments can verify observations collected during informal field observations. | Quantitative methods are simplifications of the qualitative methods and can only be meaningfully employed when qualitative methods have shown that a simplification of identified relations is possible. |

**Qualitative research**

Williams, C. (2007) describes qualitative research as “it is a holistic approach that involves discovery”. Qualitative research is also described as an unfolding model that occurs in a natural setting that enables the researcher to develop a level of detail from high involvement in the actual experiences.

Bryman, A. (2001) defines qualitative research as a “strategy that usually emphasizes words, feelings, perception, rather than quantification in the collection and analysis of data. It is intuitivist, constructionist, and interpretive, but qualitative researchers do not always subscribe to all three of these features…..Qualitative Research tends to be concerned with words rather than numbers”.

Several writers identified the features of qualitative research. Some of these cited in (Hoepfl, C. M. 1997) are as under:

1. Qualitative research uses the natural setting as the source of data.
2. The researcher acts as the “human instrument” of data collection.
3. Qualitative researchers predominantly use inductive data analysis.
4. Qualitative research reports are descriptive, incorporating expressive Language.
5. Qualitative research has an interpretive character, aimed at discovering the meaning events have for the individuals who experience them, and the interpretations of those meanings by the researcher.
6. Qualitative researchers pay attention to the idiosyncratic as well as the pervasive, seeking the uniqueness of each case.
7. Qualitative research has an emergent (as opposed to predetermine) design, and researchers focus on this emerging process as well as the outcomes or product of the research.
8. Qualitative research is judged using special criteria for trustworthiness.

There are several different methods for conducting a qualitative research; however, Leedy, P. and Ormrod, J. (2001) recommend the following five: Case studies, grounded theory, ethnography, content analysis, and phenomenology.

Creswell, J. (2003) defines that how these methods meet different needs. “For instance, case studies and the grounded theory research explore processes, activities, and events while ethnographic research analyses broad cultural-sharing behaviors of individuals or groups. Case studies as well as phenomenology can be used to study individuals”.

**Grounded theory approach**

In recent times, grounded theory approach has been very popular among social researchers engaged with small-scale research. Allan, G. (2003) stated that “Grounded Theory is a powerful research method for collecting and analyzing research data. It was ‘discovered’ by Glaser & Strauss in 1967”.

Williams, C. (2007) defines the approach as “Grounded theory research is the process of collecting data, analyzing data, and repeating process, which is the format called constant comparative method. The data can be obtained from several sources such as interviewing participants or witnesses, reviewing historical videotapes or records, observations while on-site”.

According to Glaser and Strauss (1967), there are four requirements for judging a good grounded theory as follows.

1. Fit (does the theory fit the substantive area in which it will be used?)
2. Understandability (will non-professionals concerned with the substantive area understand the theory?

Because of confusion in the coding method, it is difficult to understand for non-professionals.

1. Generalizability (does the theory apply to a wide range of situations in the substantive area?)
2. Control (does the theory allow the user some control over the “structure and process of daily situations as they change through time?”)

It can be concluded that one cannot implement this theory on daily changing situations; hence theory gives no control to its users.

Grounded theory has many limitations/Criticism as follows:

* Allan, G. (2003) stated that “The technique of coding by using Micro-analysis of data is difficult because of two reasons: firstly, it is time consuming. Secondly, this method led to confusion, when divide the data into individual words”.
* To scale the larger concepts by using grounded theory is much difficult.
* Another criticism pointed out by Allan, G. (2003) is that “Grounded theory is a lack of rigour due to careless interview techniques and the introduction of bias”.
* In coding procedure actual meaning of the data may lose or disconnected.

**Advantages and disadvantages of Qualitative research**

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| **Advantages of Qualitative Research** | **Disadvantages of Qualitative Research** |
| Provides depth and detail | Fewer people studied usually. Less easily generalized as a result. |
| Openness – can generate new theories and recognize phenomena ignored by most or previous researchers and literature. | Difficult to aggregate data and make systematic comparisons. |
| Helps people to see the world view of those studies – their categories, rather than imposing categories, simulates their experience of the world. | Dependent upon researcher’s personal attributes and skills (also true with quantitative, but not as easy to evaluate their skills in conducting research with qualitative). |
| Attempts to avoid pre-judgments | Participation in setting can always change social situation (although not participating can always change social situation as well). |
| It allows the researcher to describe existing phenomena and current situations. | It can be very subjective as the researcher often includes personal experience and insight as part of the relevant data thus making complete objectivity an impossibility. |
| It is useful in examining the totality of a unit – a holistic approach. | It has a very low reliability in that it is extremely difficult to replicate a piece of qualitative research due to the fact that it does not have a structured design or a standardized procedure. |
| It yields results that can be helpful in pioneering new ground. |  |

**Mixed methods**

Tashakkori, A. and Teddlie, C. (2003) discussed the mixed methods approach to research, which emerged in the mid-to-late 1900s. According to (Parse, R 2003) the “Qualitative and quantitative research approaches are different in their ontologies, epistemologies, and methodologies, yet there are also exists similarities in both. They are alike in that when conducted according to appropriate designs; both inquiry approaches answer research questions that arise from the researchers’ interests which are a reflection of beliefs and values. Also, both approaches elicit evidence that enhances understanding of the phenomena under study”.

Thus in case of mixed methods; researcher collects and analyzes the statistical data as well as narrative data, which is norm for quantitative research and qualitative research respectively in order to address the selected research questions.

Johnson, R. B. & Onwuegbuzie, A. J. (2004) opines that “the goal for researchers using the mixed methods approach to research is to draw strengths and minimize weaknesses of the quantitative and qualitative research approaches”.

Williams, C. (2007) concluded that “the mixed methods approach to research provides researchers with the ability to design a single research study that answers questions about both the complex nature of phenomenon from the participants’ point of view and the relationship between measurable variables”.

**Reliability and Validity**

The validity and reliability of numerical/statistical data is important to conclude efficient results. In this context (Leedy, P. and Ormrod, J. 2001) argues that “validity and reliability are important components that affect correlation coefficients”. To understand the meaning of reliability and validity, it is important to present the different definitions of reliability and validity as under.

According to Bryman, A. and Bell, E. (2007) reliability means “whether or not the results of a study are repeatable.”

Joppe, M. (2000) defines reliability in quantitative research as “The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable”.

Miles, M. B., and A. M. Huberman (1994) stated that “Reliability focuses on whether the process of the study is consistent and reasonably stable over time and across researchers and methods.

Joppe, M. (2000) provides the explanation of what validity is in quantitative research as “Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are”.

According to Bashir, M., et al. (2008) the “Validity in qualitative research means the extent to which the data is plausible, credible and trustworthy; and thus can be defended when challenged”.

Meyer, C. B. (2001) writes that “The problem with the validity criteria suggested in qualitative research is that there is little consistency across the articles as each author suggests a new set of criteria”. And “the problem of reliability in qualitative research is that differences between replicated studies using different researchers are to be expected”.

**Triangulation**

‘Triangulation’ is used in qualitative research to improve the validity and reliability which involve the use of more than one research technique within a single study. In this context Patton (2001) advocates the use of triangulation by stating “triangulation strengthens a study by combining methods. This can mean using several kinds of methods or data, including using both quantitative and qualitative approaches”.

Denzin, N.K. and Lincoln, Y.S. (1998) writes that “In order to overcome few problems, the researcher will use a mixture of data sources which is called as ‘data triangulation’ to provide alternatives to justification”.

There are several methods of triangulation as (Burns, R.B. 2000) describes various triangulation methods like “Environmental Triangulation, Investigator Triangulation, Theoretical Triangulation, and Combined level of Triangulation”.

Golafshani, N. (2003) stated that “Triangulation is typically a strategy (test) for improving the validity and reliability of research or evaluation of findings. Mathison, S. (1988) elaborates this by saying that “Triangulation has risen an important methodological issue in naturalistic and qualitative approaches to evaluation in order to control bias and establishing valid propositions because traditional scientific techniques are incompatible with this alternate epistemology”.

**Data Collection**

**Primary Data**

The primary data is the type of data which is collected by the researcher for the specific purpose of answering the problem on hand. In other words the data observed or collected directly from firsthand experience is called primary data. Primary data can be gathered by different methods i.e. communication, interacting with respondents, observation methods, surveys, interviews, or through questionnaire.

David, A. et al. (2003) stated that “The main advantage of this type of data is that the data collected is for a specific purpose and tailored for the problem”. More so one can gather un- biased and original data from this method.

The main disadvantages of this method are: it may be costly, raw data, huge volume of population, large volume of data and time consuming. Questionnaires Survey is the common method conduct to collect primary data.

**Secondary Data**

Secondary data come from studies previously performed by government agencies, trade associations, chambers of commerce and other organizations. Secondary data can also be found in local libraries, on the Web, books, government publications, periodicals as well as electronic databases, magazines and newspapers, are also great sources of secondary data.  Good marketing research should always start with secondary data.

One of the advantages of secondary data is that it is often cheaper than doing primary research. In this context Morgan, D.L. (1993) argued that “The advantages of secondary research is that it can be much quicker and cheaper to access, where many companies may not able to have the resources to carry the research”. Another advantage of the existing data is that its saves time. Gilbert A., Churchill, Jr. (1995) has written that “The most significant advantages of secondary data are the cost and time economies they offer”.