Research –in layman's perspective

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Abstract

Research is a systematic investigation and study, in order to establish facts and reach new conclusions. It is a methodical study in order to prove a hypothesis or answer a specific question through experimental process leading to quantitative research or a sytematic exploratory experimental process following a series of steps and rigid standard protocol to understand underlying reasons, opinions, motivations and insights to develop ideas which leads to qualitative research, for potential quantitative research. A wider pragmatic approach to science may involve a mix of qualitative and quantitative approach which appears best suited to the research problem to attribute meaning to their approach leading to mixed research. Mixed approach has an advantage of triangulation with respect to data, investigator and theory or methods. Any method adopted, has its limitations and flexibility with different approaches complementing one another, and philosophies guiding research, do not restrict different approaches in the same study.

KEYWORDS: Research, Qualitative Research, Quantitative Research, Data, Methodology, Analysis, Process.

Introduction:

Research is a creative, systematic, organized work used to establish, confirm or reaffirm the results of previous work, solve new or existing problems, support theorems, or develop new theories. The primary purpose of basic research are documentation, discovery, interpretation or research and development (R&D) for the advancement of human knowledge. Unlike corporate activities, research and development activities do not yield immediate profit and often carry risk and uncertain return on investment. Though higher research and development spending does not guarantee more creativity, higher profit and great market share, Research and development is of great importance in business in the competitive world of production, to keep pace with the modern trends of needs, demands and desires of customers vying a competitive edge in methods, manufacturing and process of production.

Research

What is Research?

Is it Re-search or search a search? So does it become cyclical?

Research is an attitude. The aim of a reasearcher can be a **PhD** or **Publications** or a **hunger for research**. When it is a hunger for research, **it is an attitude**. A research attitude becomes holistic when it is a hunger for research. Is it a cyclical process? If it is a cyclical process, when to stop your research will depend on your objective.

Objective collection — Research Objective – Constant always, which is the data

Researcher's Objective – the process of research (when researcher's objective is satisfied, the cycle stops)

For example: You have conducted a research study on "the effect of x on y". Someone else may conduct a research on "the effect of y on x" based on your research. For this, we depend on review of literature. So if two researches are done in different ways the method cannot be compared. Hence mechanical checks are required which we call it as process or standardization. This necessity for mechanical checks give rise to some questions and answers.

Why a process is required?

To standardize

How to standardize?

This 'how' is termed as Research Process or Research Methodology. The advantage of a research process or research methodology is we can compare and the output remains more or less the same, though percentages may vary.

What is the condition of acceptance? Or where do we set the condition or arrive at a proper standardization?

This happens with "accuracy, precision and reliability" through a scientific interpretation and process.

How do we go about it?

Identify a research problem. 

If it is a commercial research there is no confusion. In Academic research, there is confusion of topics and how to identify a research area. Once you have identified the research area, you can deduce a research topic. Then you may identify a research problem, form a hypothesis and then experimentation. In all these levels one need to identify and follow the "Research Insticnt". The conventional method of finding and identifying a guide and choosing a topic of guide's interest is a wrong attitude. In foreign Universities, Research area and Topic is decided and then the Guide is selceted. In India still the other way round is practiced in many places. Ideally one needs to search his/her research instinct, attitude and aptitude to select an area, topic and problem identification. One easiest method is, for example if you are planning to do a research in management, then do a literature review in the areas of **Finance**, **Marketing**, **HR**, **Operations Management** (OM), **Structural Management** (SM), **General management** (GM) etc. Suppose you have collected 1000 articles on management then seggregate and compartmentalize in each bins. Suppose say you get 470 in Marketing, 300 in Finance, 100 in SM, 100 in OM, and 30 in GM, then definitely your Marketing bin is more. In Marketing Behavior you collected the 91 articles in Consumer Behavior. Seggregating those 91 articles into tangible (say 21 articles) and intangible (say 70

articles) you will find logical progression is for intangible. So "Financial Services under Intagible under Marketing can be your research area. Now you may focus the literature review on the financial services under intangible in Consumer Behavior without any restriction for magazines or journals or newspapers.

On review you realize that you have a liking for "Commodities", or "Bullion Market" started attracting you and you realize that you have kept your domain as "Financial Services on consumer Behavior of Intangible". Here you go deeper into literature review concentrating on

X theories …(relevant to the topic, how many theories you agree or disagree)

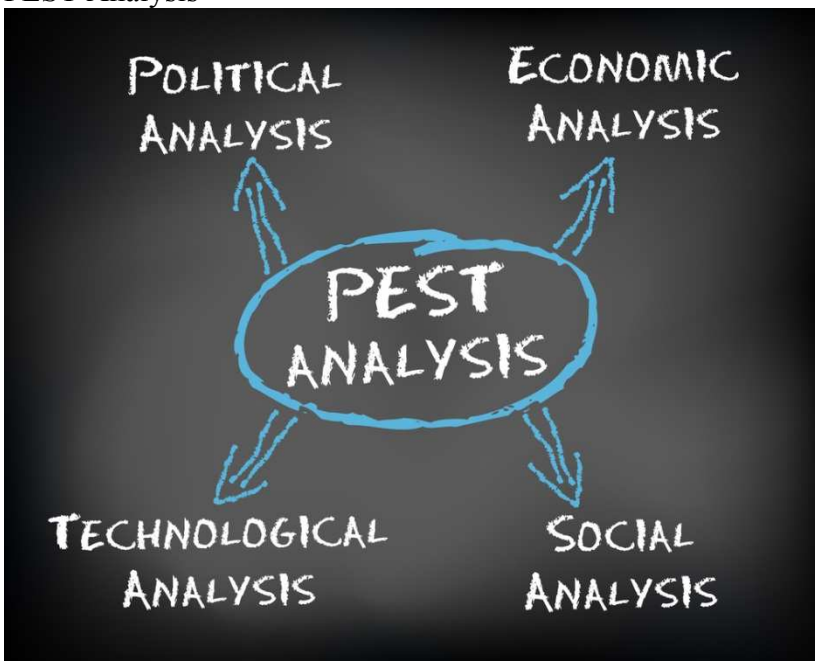
Capacity (to understand or continue research on that topic)

Resources (Money, Human resource)

After all these process suppose you arrive at 6 research topics. From now on it is difficult since you have your likes and dislikes and you have the backing of theories and literature review.

At this juncture we need to use some tools for more clarity.

1. PEST Analysis



The basic PEST analysis includes four factors:

- **Political** factors are basically to what degree the government intervenes in the economy. Specifically, political factors include areas such as tax policy, labor law, environmental law, trade restrictions,tariffs, and political stability. Political factors may also include goods and services which the government wants to provide or be provided (merit goods) and those that the government does not want to be

provided(demerit goods or merit bad's). Furthermore, governments have great influence on the health education, and infrastructure of a nation.

- **Economic** factors include economic growth, interest rates, exchange rates and the inflation rate. These factors have major impacts on how businesses operate and make decisions. For example, interest rates affect a firm's cost of capital and therefore to what extent a business grows and expands. Exchange rates affect the costs of exporting goods and the supply and price of imported goods in an economy.

- **Social** factors include the cultural aspects and include health consciousness, population growth rate, age distribution, career attitudes and emphasis on safety. Trends in social factors affect the demand for a company's products and how that company operates. For example, an aging population may imply a smaller and less-willing workforce (thus increasing the cost of labor). Furthermore, companies may change various management strategies to adapt to these social trends (such as recruiting older workers).

- **Technological** factors include technological aspects such as R&D activity, automation, technology incentives and the rate of technological change. They can determine barriers to entry, minimum efficient production level and influence outsourcing decisions. Furthermore, technological shifts can affect costs, quality, and lead to innovation.

Expanding the analysis to PESTLE or PESTEL adds:

- **Legal** factors include discrimination law, consumer law, antitrust law, employment law, and health and safety law. These factors can affect how a company operates, its costs, and the demand for its products.

- **Environmental** factors include ecological and environmental aspects such as weather, climate, and climate change, which may especially affect industries such as tourism, farming, and insurance. Furthermore, growing awareness of the potential impacts of climate change is affecting how companies operate and the products they offer, both creating new markets and diminishing or destroying existing ones.

Other factors for the various offshoots include:

- **Demographic** factors include gender, age, ethnicity, knowledge of languages, disabilities, mobility, home ownership, employment status, religious belief or practice, culture and tradition, living standards and income level.

- **Regulatory** factors include acts of parliament and associated regulations, international and national standards, local government by-laws, and mechanisms to monitor and ensure compliance with these.

Applicability of the factors

The model's factors will vary in importance to a given company based on its industry and the goods it produces. For example, consumer and B2B companies tend to be more affected by the social factors, while a global defense contractor would tend to be more affected by political factors. Additionally, factors that are more likely to change in the future or more relevant to a given company will carry greater importance. For example, a company which has borrowed heavily will need to focus more on the economic factors (especially interest rates).

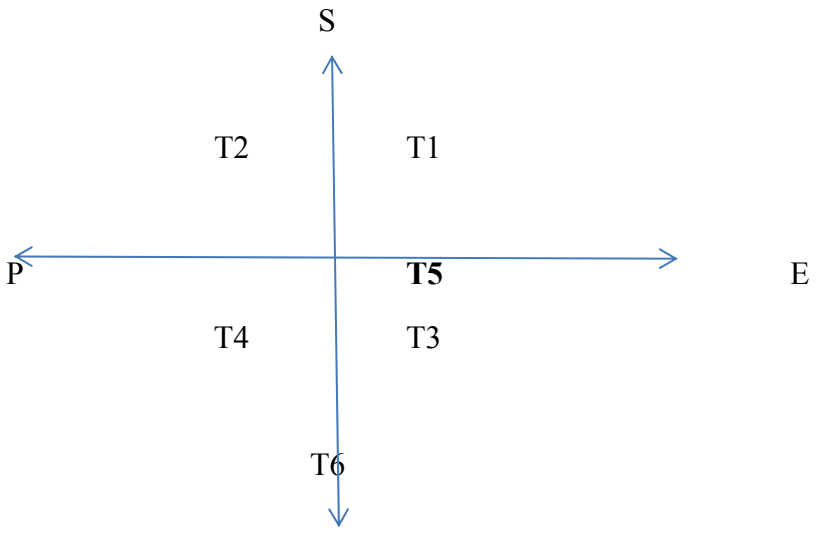
Furthermore, conglomerate companies who produce a wide range of products (such as Sony, Disney, or BP) may find it more useful to analyze one department of its company at a time with the PESTEL model, thus focusing on the specific factors relevant to that one department. A company may also wish to divide factors into geographical relevance, such as local, national, and global.

Use of PEST analysis with other models

The PEST factors, combined with external micro-environmental factors and internal drivers, can be classified as opportunities and threats in a SWOT analysis. A graphical method for PEST analysis called 'PESTLEWeb' has been developed at Henley Business School in the UK. Research has shown that PESTLEWeb diagrams are considered by users to be more logical, rationale and convincing than traditional PEST analysis.[2][3]

1. Collins, Rob. "A Graphical Method for Exploring the Business Environment" (PDF). Retrieved 19 June 2014.
2. **Jump up^** Collins, Rob. "Is there a better way to analyse the business environment?" (PDF). Retrieved 19 June 2014.

Assume that a PEST analysis was conducted for Topics, T1 to T6.



Nature of topic

T1 – Social

T2 – Political

T3 – Economical

T4 – Technological

T5 – Politically Economical

T6 – Technological

Analysis of this PEST in graphical method or scoring method

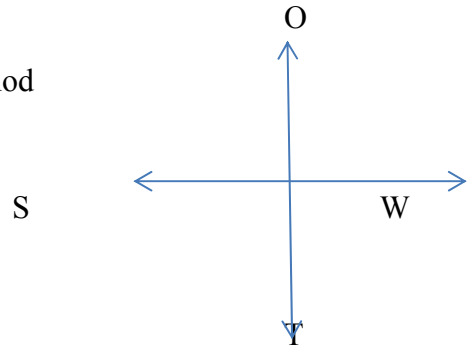
Topic	P	E	S	T	Total
1	10%	40%	20%	30%	100
2	20%	30%	20%	30%	100
3					
4					
5					

Analysis of PEST in 5 point scale method

Topic	P	E	S	T	Total out of 20 (5topics x4 = 20)
1	4	1	2	1	8
2					
3					
4					
5					

SWOT Analysis on Research (graphical or scoring method)

Graphical method



Scoring method

S	W	O	T

Ideally SWOT has to be done for three areas

1. Resource SWOT
2. Capability SWOT
3. Financial SWOT

Resource SWOT

What kinds of resources are available for the topic?(If it is not available, then secondary data would be a problem)

Lot of literature + research gap = **Strength**

Lot of literature, but no research gap = **weakness**

Equal number of opponents (100 reviews, 50 good, 50 bad, then tight ropes – **threat)**

If you are intending NobelPrizethen topics that have lot of threat and weaknesswould be a better option.

Capability SWOT

If you do research on known area, you can easily sale through, else you can learn more. Either way it will do you good.

Financial SWOT

Funds for data collection and cost for structural data, direct cost, indirect cost, technical tools cost, training cost are all areas of concern.

Importance and use of Theory

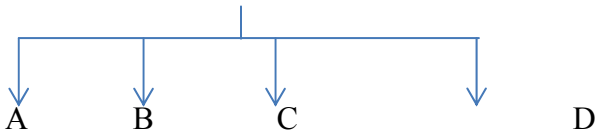
Suppose your **Research topic** is "Seasonal behavior of Gold in Financial Market". Then Review of literature should be based on the above. Accordingly you need to identify a few theories or a single theory. Say, if you have identified three theories viz. Theory1, Theory2, Theory3.

	Theory 1	Theory2	Theory 3
Supporting	✓	✓	✓
Opposing	X	X	X

Decide whether you would like to support or oppose the theory. This is known as Research Prerogative. For this believe on your guts or take support or you can conduct study on intermediate study, where you will get an answer for why some theories are agreeing and some are opposing or why some fall on both sides. This can form the Research Problem. OR, if your data collected fall under Theory 2, you support the theory and review the entire literature available on this and you come across a gap somewhere, then this gap can be your research problem. You may regionalize and change your topic as "Seasonal behavior/growth of Gold in Indian Financial Market".

Another option is, if Theory X is on 4 dimensions

Theory X



Here you can do research on,

What is the effect of A on Theory X, or what is the effect of A on B, B on C or Con D, or vice versa, or how X is dependent on each on what %.

Once research problem is identified, then we move on to research design. It can be Experimental Study, Descriptive study, Exploratory study or Impact study. Exploratory study is "As is what is" or observatory or Questionnaire method, ex: Socio economic state of a group or taking a theory and studying it whether it holds good or not.

In Impact study there should be Quantity A and Quantity B or Variable C and Variable D.

There should be an impact study between A and B. Ex: A is dependent on B by 40 %. If A is changed, B will change by 40 %. Or impact of C on D. There is a relationship or impact and your research study is to find the strength of the relation which is the impact and your research will find the impact of A on B i.e. for ex: 0.07%.

Impact study is purely quantitative.

For ex:

Impact of age in women's gold purchasing behavior.	
X	Y
Age	Gold purchasing behavior of women (consumer behavior **CB**)
(Quantifiable)	(Indirectly quantifiable)

Here if the consumer behavior (CB) has variables D1, D2, D3, D4,

First you need to find the impact between age and CB, then relation of D1, D2, D3, D4, to Consumer Behavior and reverse. So there could be dimensions and sub dimensions. If it is only age and overall consumer behavior then you need to study only two areas. In impact study, hypothesis is mandatory whereas in exploratory, hypothesis may be skipped.

In Descriptive study, secondary study (where data already exists) may be conducted. So secondary study becomes part of research study.

Once research problem is identified, design is finalized, we can move to research process.

Research Process

We need to generate data for the process. If it is case study method, it will be categorized under so many factors under one subject and we cannot mix the results. Each subject will be a separate case.

Process- Review of Literature

Literature review should be done for a minimum of five times in the entire research process. From the review we need to identify theories or variables, what are the available theories, what are the available models, if so, what are the different models, different variables? , these are all important factors while reviewing literature.

Once literature is reviewed,

We can convert it into a table:

Author	Year	Publication/Article	Journal	Theory	Your point of view

OR

It can be produced as another discussion, Ex: As the theory suggests……and my view is ……

(In footnote, give author name, year, and title in quotes (if in quotes, no italics), journal, volume, issue, page numbers, where you accessed from)

Variables can be from theory or model

Variables	Author 1	Author2	Author 3	Author 4	Cumulative Score
V1	✓	X	✓	✓	3
V2					
V3					
V4					

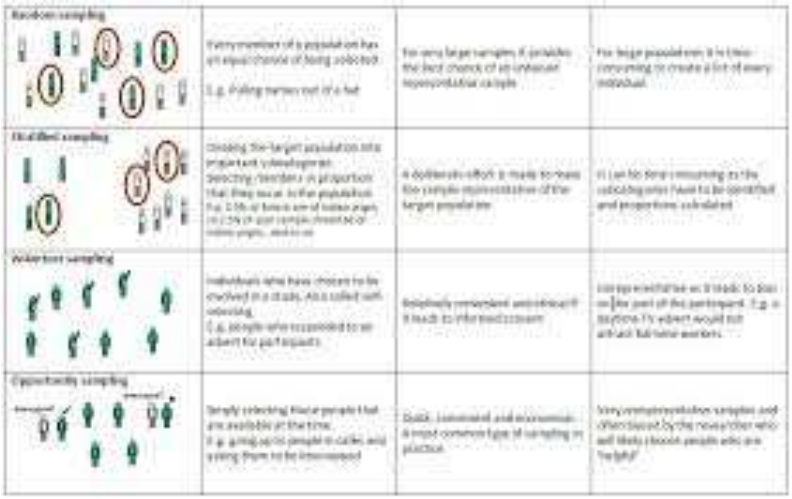
✓ Important (author refers it as important)

X – Not important (author refers it as not important)

This table will give you list of variables. Here you need to decide whether you want to go with survey or population.

If it is survey method, go for sample or questionnaire:

1. **Survey method, go for Sample or questionnaire method**



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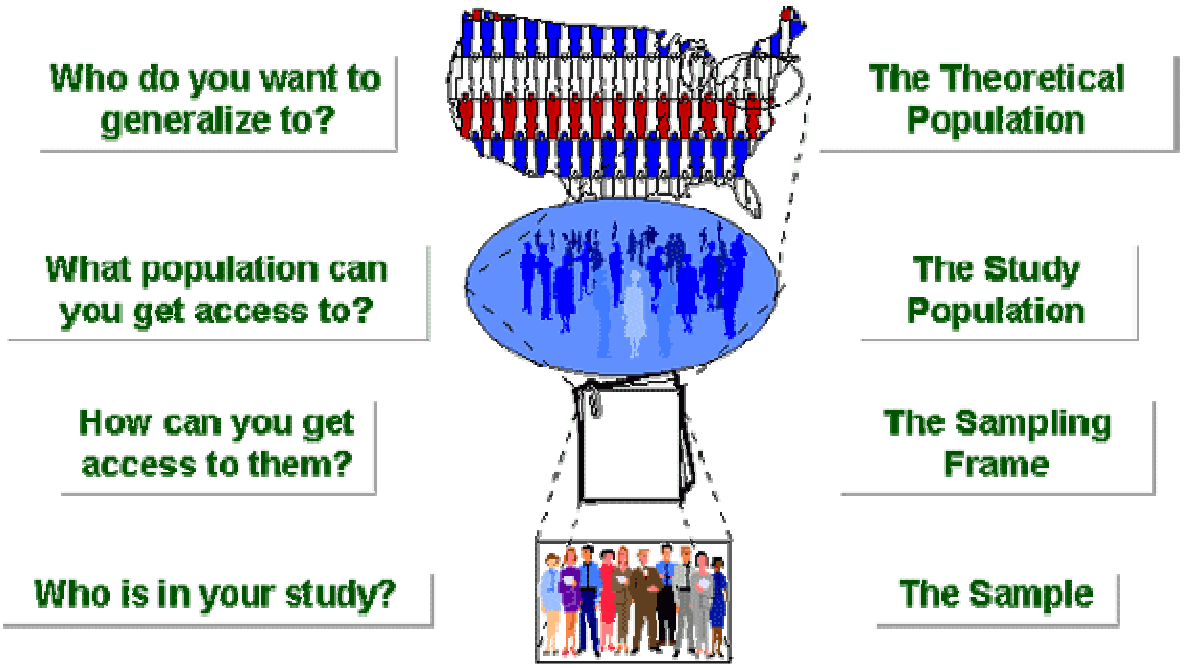
If it is population method, go for scheduling or ID card method

2. **Population method – go for schedule method (you will consider the subjects and variables)**



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3. ID card method

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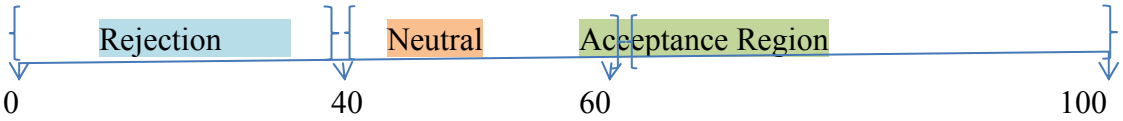
List of Variables (Cumulative Weights)

Qualitative study (focus group study)

Four or five homogenous samples, say for example students, sample size taken between 5 and 20. Even if you take 20 subjects, convert into 4 groups of 5 members.

- Focus groups
- Research Scholars/Peers (who are already working on that or similar topic)
- Subject Matter Experts (SME's)
- Sample subjects



From this, rejection region, neutral region and acceptance region is very clear.

Neutral area is the researcher's prerogative whether to keep it or drop it.

After this you will get the "tentative survey instrument"

Basic Characteristics of a variable

Reliability

1. Test – Re-test
2. In additive
3. Homogenous

Validity

1. Criteria validity
2. Content validity
3. Affirmative validity for sample survey
4. Conclusion validity (from start point to end point. Presented at the end of the thesis, this is important for publications)

To conduct any of the tests like t-test, ANOVA or SPSS, you need data.

Authentic data is an ideal situation. Data simulation is also conducted sometimes.

Data simulation is based on random number based on system clock. So tests in two systems may generate two different data for the same variables. In simulation one data set is not enough. You need to generate at least 10 different data system

Tentative Survey instrument, Simulation

Alpha greater than or equal to 0.6

Before you run any statistical test, you must first determine your **alpha**level, which is also called the "**significance** level." By **definition**, the**alpha** level is the probability of rejecting the null hypothesis when the null hypothesis is true.

Turnkey greater than or equal to 0.05

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The Turnkey Variant Analysis Project

The Turnkey Variant Analysis Project (TVAP) focuses on the discovery and interpretation of genetic variants by providing a computational framework and high throughput data analysis tools for use with the latest DNA sequencing technologies. TVAP is flexible and powerful enough to be adopted by experienced laboratories, while at the same time providing high quality, push-button analysis of sequence data for those with little bioinformatics expertise.

tvap.genome.wustl.edu

Hoteling less than or equal to 0.05

One-Sample Case The one-sample T2 is used to test hypotheses about a set of means simultaneously. Specifically, suppose a set of p response variables Y YYp , , , 1 2 Λ is measured. Assume that the population is distributed as (μ,Σ) N p , where (μ,Σ) N p is the p-variable multivariate normal distribution with mean vector μ and covariance matrix Σ . The null hypothesis that μ = μ0 , where μ0 is a vector of p constants (often 0's), can be tested using the test statistic ( ) ( ) 0 1 0 2 = − μ ' − μ − T n y S y where y is the sample mean vector, n is the sample size, and S −1 is the inverse of the sample covariance matrix. If the null hypothesis that μ = μ0 is true, then T2 follows Hotelling's T2 distribution. That is, 2 T 2 ~ Tp,n−1 . Reject the null hypothesis if 2 T 2 ≥ T1−α,p,n−1 . Note that rejecting the null hypothesis concludes that at least one of the p means is not equal to its hypothesized value.

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In SPSS (Statistical Package for Social Sciences), alpha represents Cronbach alpha, the most common measure of reliability or internal consistency. It is commonly used when you have multiple Likert questions in a survey /questionnaire that form a scale and you wish to determine the reliability.

Example

A researcher has devised a nine-question questionnaire to measure how safe people feel at work at an industrial complex. Each question was a 5-point Likert item from "strongly disagree" to "strongly agree". In order to understand whether the questions in this questionnaire all reliably measure the same latent variable (feeling of safety) (so a Likert scale could be constructed), a Cronbach's alpha was run on a sample size of 15 workers.

https://statistics.laerd.com/spss-tutorials/cronbachs-alpha-using-spss-statistics.php

With this your survey instrument is ready (tentative). Since this tentative instrument is tested and validated, it is ready for pilot study. It is Tentative since you tested with simulated sample and not authentic ones. If you are using authentic data then your data is set.

Pilot study

Simplest rule in pilot study is that, multivariate; trisquared distribution scale must be zero, close to zero or near to zero. The next concern is when you can stop this pilot study. Thumb rule is if number of variable<100, conduct at least, pilot study size of 50. Take 70 samples if pilot study done for 100 to 200. Take 100 samples if pilot study done for 200 to 300. Then eliminate all errors.

Measurement and Scaling

To understand this we need to understand Scale, Scaling, items and measurement.

What is Scale?

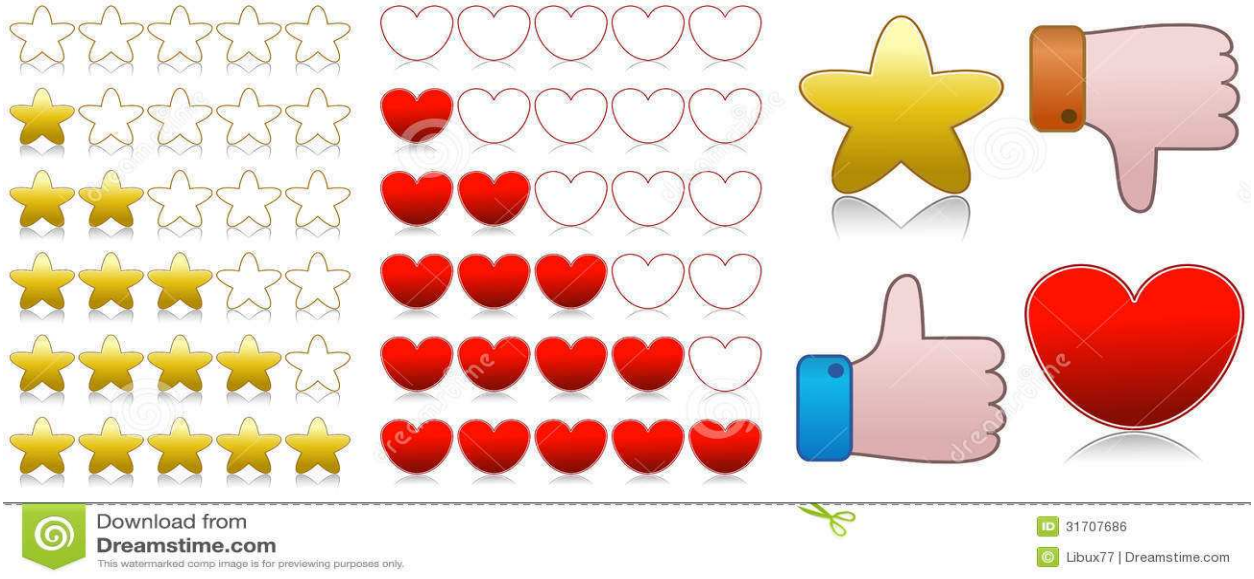
It is tangible for physical and chemical sciences, But intangible for attitude or behavior. So create, use it, validate it a number of times. Hence develop a scale, do the testing and calibrate it.

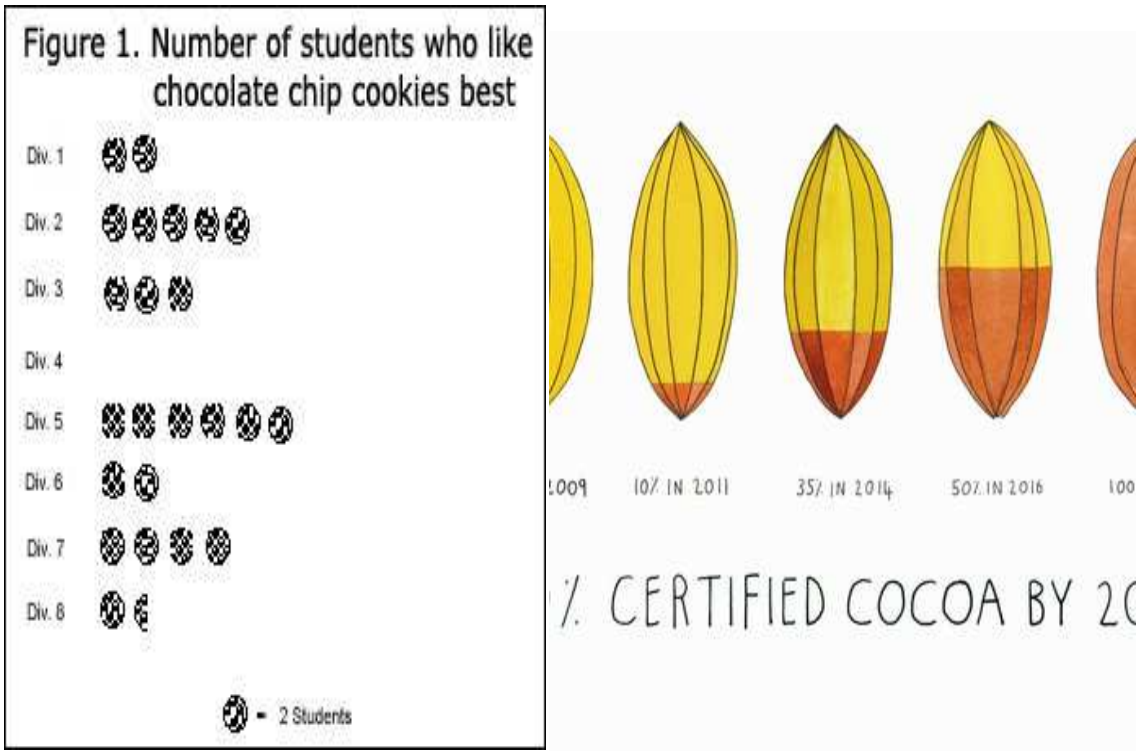
What is scaling?

While measuring in units, whole unit is a scale and sub units of mm, cm, fraction etc. is scaling.

Scaling may be graphical or non-graphical.

Graphical scaling may be very creative with stars, chocolate symbols, smiley's etc.





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Non graphical Scalemay be balanced or unbalanced. In a balanced scale you will travel 'X' times on left side and right side. A scale can be a 3, 5 or 9 point scale.

So ranking in 3point scale is -1, 0, and +1

Ranking in 5 point scale is

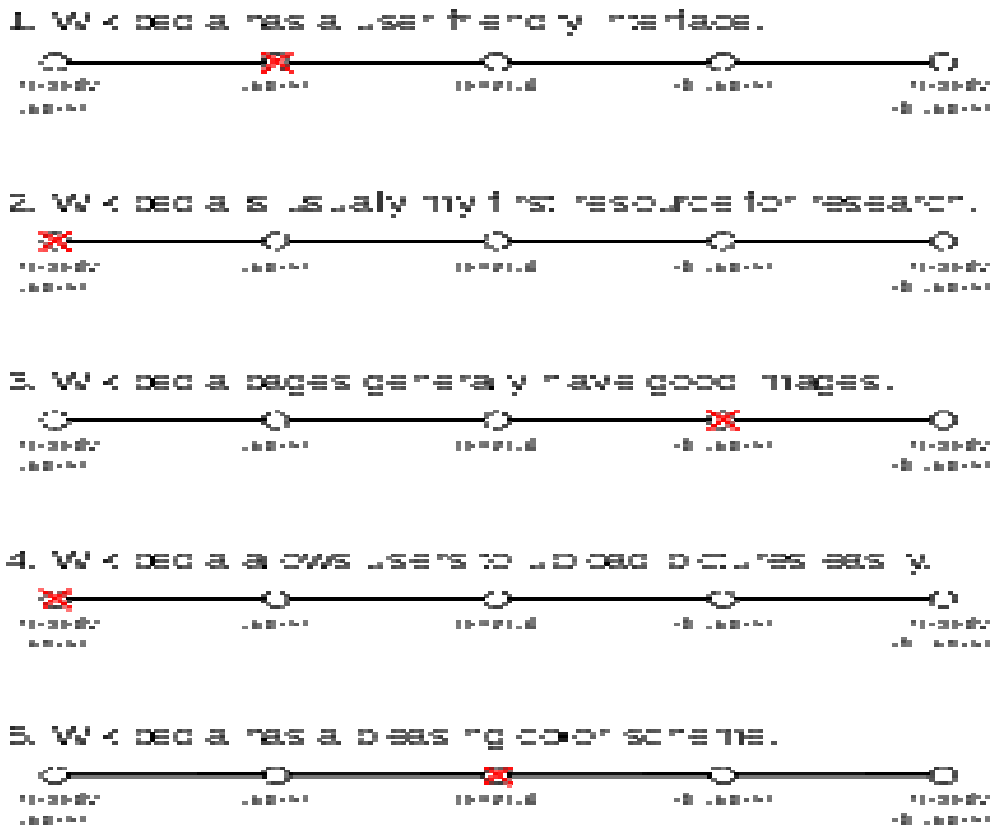
1,2,3,4,5 or

5,4,3,2,1 or

2,-1, 0, 1, 2

Likert Scale

It is the most widely used approach to scaling responses in survey research, such that the term is often used interchangeably with rating scale, or more accurately the **Likert**-type scale, even though the two are not synonymous. The scale is named after its inventor, psychologist Rensis **Likert**.



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In a center point scale, you travel equal parts left and right. If you remove the center point or the neutral point, it becomes an unbalanced scale, third point to second point or 5th point to 4th point. Ideally for a research, positive side or negative side is taken. Neutral side is usually not considered.

Understanding Sampling

To understand Sample size, sampling methods and sampling techniques, we need to understand the following:

- Universe
- Population
- Sample Frame
- Sample Area
- Sample Element

Example: In a state Kerala, if you consider Trivandrum city as the whole population. If you take all the nurses in TVM, it becomes Sample Frame. Since you are using discrimination, sample area is physical area where your sample elements are present.

Sample element is the one single element or subset of one element forms your sample frame.

If you consider A(1, 2, 3,4,5) Sample frame :

A (1) sample element, which is a subset.

Sample size may be manual or computer based
Manual – with reference data and without reference data.

Manual Sample size with reference data (MSD)

Example: Equation for sample size N

$$N = \frac{Z \text{ value} \times MSD}{\text{Allowed error}}$$

Z value = constant at 95% or 99%
@95% - 1.96……allowed error..5%
@99% - 2.242 …….allowed error 5%
So what is changing is MSD/allowed error

There is a maximum ceiling also i.e. $1/6^{th}$ or $1/10^{th}$ rule

$1/6^{th}$	1/10th
Used in finite population	If population > or equal to 5000, < 20000
Not allowed to take 'i th' element or +1 element after $1/6^{th}$ element i.e. 3000/6 = 500, so 501 is not allowed	If relatively finite, i.e. approximate. If population size is 6000, 6000/10 = 600, so 601 is not allowed
In above example, the range should be 465-500	So sample should be very close to maximum

Manual without Reference Data

This is with no predecessor study or pilot value study. We accept the universal normality. i.e. population is always normal. So curve goes from –alpha to +alpha. But we cannot control. We can say from -100 to +100 or 1 to 100. Or curve between 0 and 1. When you calculate MSD, all values will be 0 and 1 theoretically. Practically you will get >1. So perfect MSD, theoretically lies between 0 and 1.

Sampling
Sampling method is the criterion and sampling technique is tool. Sampling can be probabilistic sampling or non-probabilistic sample. 95% of research is non-probabilistic sample. Techniques are the tools or base of identification.

Probabilistic sample technique
Proportionate technique – you will use a condition called STRATUM (an equation). Example: in a certain society,
Male: female = 51:49, 100 samples:100x51 = 51 males: 100x49= 49 females
100
Non-proportionate – samples are taken randomly. Simple random for coin, dice, card, lists, lottery.
In sampling, you may have area sampling, cluster sampling, multistage sampling, or hierarchical sampling.

Authentic Data collection may be **conventional, post/mail, telephonic, email, web survey, voice polls, IVRS surveys, building smart Apps, Chart, social network and polls or blogs.**
Once data collection is over you enter into data cycle. Whenever you prepare questionnaire, prepare code book, and then prepare blank data design.

As a research scholar, you should know data generation, data cycle and data techniques.
Data Cycle

- Check (data check)
- Data editing
- Data calculation
- Data manipulation (data set is unreliable until you maintain maximum cells and restrict missing values)
- Data summarization (bar/line for mean procedure, Pie for frequency procedure, sample analysis and chart)
- Data visualization (cross tab, multiple graph, cross-sectional chart)

Now we may proceed to data analysis

Data Analysis

❖ Univariate Analysis (ex: dependent sample before and after)
❖ Bivariate Analysis (t-test, ANNOVA, Chi square test)
❖ Correlation (strongly linked variables)
❖ Factor analysis (variability among observed correlated variables in terms of unobserved
Variables called factors)
❖ Regression (relationship between dependent variable or one or two independent Variable)

If you find a correlation, unless you find regression the model is not complete. So you need to do a factor analysis and find out if the variable is dependent or independent.

Bivariate condition

V1	V2	test
Category	Scale	< or = 2, t-test
Scale	Category	>2, ANNOVA
Category	Category	Chi square
Scale	Scale	Correlation (we build regression model)

Once the data is analyzed, we can proceed to Reporting or Article Preparation.

Reporting Style

APA – AmericanPsychological Association
AMA – American Management Association
IEEE –Institute of Electrical & Electronics Engineering (for engineering students)

Based on the types of data we can classify **Research** as following:

- **Qualitative**
- **Quantitative**
- **Mixed**
- **Hybrid**

Qualitative Research – is about exploring issues, understanding phenomena and answering questions by analyzing and making sense of unstructured data. From health studies to academic, market and policy research, qualitative research happens in nearly every work place and study environment, nearly every day.
Focus groups, in-depth interviews, content analysis, ethnography, evaluation and semiotics are among the many approaches that are used, but qualitative research in its most basic form involves the analysis of any unstructured data, including: open-ended survey responses, literature reviews, interviews, audio recordings, videos, pictures, social media and web pages (http://www.qsrinternational.com/what-is-qualitative-research.aspx).

Quantitative Research - In natural sciences and social sciences, **quantitative research** is the systematic empirical investigation of observable phenomena via statistical, mathematical or computational techniques. (https://www.google.co.in)

Mixed Research:
"Involved integrating quantitative and qualitative approaches to generating new knowledge and can involve either concurrent or sequential use of these two classes of methods to follow a line of inquiry." – **Stange K et al (2006).**

"Integrating quantitative and qualitative data collection and analysis in a single study or a program of enquiry." – **Creswell et al 2003**.
www.nd.edu.au

Hybrid Research:
Hybrid research can be defined as the combination of qualitative and quantitative techniques, where a qualitative approach is utilized to uncover the meaning and attitudes behind quantitative data. (https://www.google.co.in)

Qualitative Research usually starts from nowhere and ends up with hypothesis. Whereas Quantitative Research starts with hypothesis, prepare methodology and prove the hypothesis.
In qualitative research, you may get a text model, conceptual model or conceptual theory. Hence Qualitative Research can lead to further Quantitative research.

Qualitative Research Process – For the process, you should know what the Data collection methods are.

- Singular method
  - One subject at a time
  - Interview
    - ❖ Formal (structured)
    - ❖ Semiformal (Semi structured)
    - ❖ Informal (unstructured)
  - Questionnaire
    - ❖ Structured
    - ❖ Semi structured
    - ❖ Unstructured
- Group method
  - Many subjects at a time
    - ❖ Group discussion
      - Moderated or hosted
      - Non moderated or unhosted
      - Focus groups (homogenous)
      - Mass observations

In most cases Qualitative Research starts with a doubt, assumption or a gut feeling.

- Doubt/assumption or gut feeling
- Review of literature
- Identify model/variables, (if your assumption was X related to Y, midway you realize X 's relation with Y is not confirmed, it may or may not a relation, then go back review and change it)

- Pre-Qualitative study (Focus Groups)
  - Research Scholars
  - Subject Matter Expert's

    - Samples
- List of variables
- Media/medium
- Design data collection
- Proceed with data collection
- Digitize data collection
- Coding
- Text inferences
- Conclusion
- *Theory or Conceptual Model or Text Model*

Qualitative research can lead to theory, conceptual model or text model. You can patent the model also.

This Qualitative Research may lead to a potential for a Quantitative Research, a mixed research or hybrid research.

Conclusion

In 2004, while reviewing the science and technology policy of the Government of India, A.P.J. Abdul Kalam said:"In a world where the powers are determined by the share of the world's knowledge, reflected by patents, papers and so on…it is important for India to put all her acts together to become a continuous innovator and creator of science and technology intensive products." The importance of scientific and technological advancement in today's highly globalized environment cannot be overstated. In 2007-08, India had about 156 researchers per million in the population, compared with 4,700 per million in the United States. In 2007, China had 1,423,000 researchers second to United States (1,571,000) and India in comparison had 154,800. India spent about US$24 billion in 2007-08 on R&D. Not enough PhD's graduate in India in number or excellence to meet the growing staff requirements of its universities. This is bound to have serious repercussions on the country's intellectual edge. The long-time policy of target-oriented research in selected thrust areas, as against open-ended research, is at a cost of basic sciences. Research in basic sciences is critical for the success of applied sciences and technological advancement.
The big question remains as to whether a PhD is for a name tag or for an attitude of research, for the quality and betterment of education eco-system. How many publication's or researchpapers are published in National, International and Global level? Can India be proud owners of Citations? We need to build a higher education system that is superior in quality and committed in relevant research in science and technology, which is the only key to continued success for India in a globalized knowledge-driven economy. The entire science eco-system should focus on future sustainability. Guaranteed funding, recognitions for outstanding contributions and achievement, inclination for research and early careers in research, may bring in the full potential to encourage talented youngsters and to inspire the youth to choose a vocation in research, to elevate the prestige of scientific research.

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