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NGO EDUCATION PARTNERSHIP

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DVV International

A Practical Guide to Grassroots Research

NGO EDUCATION PARTNERSHIP (NEP)
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Background

Project: "Tackling the Implementation Gap in Education Reform; Mobilizing Civil Society"

With funding support from the European Union and BMZ, NGO Education Partnership (NEP) in co-operation with DVV International, has developed a programme of activity aimed at improving educational services in Cambodia through the stronger and more structured engagement of Civil Society in public service monitoring and collective advocacy. This project, which runs from 1st January 2016 until 31st December 2018, offers the opportunity to significantly advance the engagement of NGOs in Government policy, and strengthen Civil Society approaches in a sustainable way.

This project aims to build the capacity of CSOs working specifically on education to participate more fully and more effectively in local governance and decision-making, influencing national and local policy to improve the equity and inclusiveness of education service delivery, and respond confidently in strengthening local accountability.

One main activity of this project is to provide training to CSO network members at a local level to support policy analysis and develop effective sub-national advocacy activities through the Provision of cluster training for P-ESWG members on community-based research, policy analysis, and effective education advocacy

A research trainer was sub-contracted to provide a tailored training and capacity-building programme to CSOs active within sub-national networks.

Acknowledgment

This project activity consumed huge amount of work, research and dedication. Still, implementation would not have been possible without support from many individuals and consultant. Therefore we would like to extend our sincere gratitude to all of them.

First and foremost, we are grateful to Mr. Yorth Bunny, the Research Trainer for provision of expertise and technical support in providing tailored trainings to P-ESWG members on community-based research and on producing this manual. Without his superior knowledge and dedication, this Grassroots Research training manual would have not been completed.

Special thank towards NEP team who devoted their time and knowledge in the implementation of this project and providing comments on this Grassroots Research training manual.

Finally, we are thankful to the European Union and BMZ for their financial support.

Research and Grassroots Research

What is education? Why is the education important? How are grassroots people necessary for its reforms and other policies? How should we measure if any educational program relevant, successful, and beneficial? Do I have a role to improve it in my province? …..

Every day people ask questions to get information, investigate things, and decide what to do and not to do. Asking questions is a form of doing research even though it can be formal or informal, but many people fail to acknowledge it. According to Cambridge Advanced Learner's Dictionary, "*re*", meaning "do again", is a prefix to be added to verbs such as build, search, and use to become rebuild, research, and reuse. "*Search*" means to look somewhere carefully in order to find something. Combined together, these two words become "research", according to the dictionary, is "a detailed study of a subject, especially in order to discover (new) information or reach a (new) understanding". The earliest use of this term was back in 1577 (Rapple, *Research Methods & Data*).

In this globalized world, issues are getting more complex and interrelated. Accordingly, growing importance of the research is highly needed, especially for implementing non-profit projects in developing countries. Sekaran (2007) stated that "research is a systematic and organized effort to investigate a specific problem encountered in the work setting, that needs a solution", continuing to claim that after a problem is clearly defined, steps and efforts can be taken to gather sufficient information, analyze the data, and determine the factors that are associated with the problem and solve the problem by taking the necessary corrective measures.

Similarly, Chaturvedi (in *Sampling Methods*) provides that "Research is an ORGANIZED and SYSTEMATIC way of FINDING ANSWERS to QUESTIONS". The research is organized because there is a clear structure or method in planning and conducting research, which is contextually focused and limited to a specific purpose. It is systematic because researcher needs to tie together research problem, research statement, data collection, data analysis, data interpretation, conclusion, and recommendation. Finding answers to the questions is an integral part of the research. Without questions, there is no research because there are no direction and drive; however, with good questions, but there is no answer, it is still a research.

Grassroots Research is a research. It is coined in this research manual to mainly be friendlier, more common, and more relevant to local or grassroots people as data sources so that they will not feel a new idea or a weird intervention being introduced to them in any part of the research, especially in the data collection. In this concept, the grassroots research is just another formal, organized, and systematic research, which will be practically designed by the researcher to collect data from grassroots people in their communities.

Over the years, researchers, especially those in development, business, and academy, are inspired to do a number of research, including grassroots research, applied research, and action research, to name a few. The research, as in general rules, is formal and in an organized and systematic approach for exploring and solving both social and scientific challenges.

Types of Research

From different angles of these efforts, the research has been named and categorized differently from one group to another according to its use/objective, time, purpose, manipulation, and data collection techniques, as provided in a table, below.

Criteria	Types of Research		
Use/Objective	Basic Research	Applied Research	Action Research
Time	Longitudinal Research	Cross-Sectoral Research	Case study
Purpose	Explanatory Research	Exploratory Research	Descriptive Research
Manipulation	Experimental Research	Non-Experimental Research	
Data collection techniques	Qualitative Research	Quantitative Research	

Source: Adopted from Kumar (2014) and Neuman (2014)

Even though it is classified and called differently, it does mean that it is separate because in the real practice it is found to be related, complementary, and overlapping. Below is a little more explanation of each type of the research:

Type of Research: Use/Objective

Under this criteria, there are three types of research: Basic research, Applied Research, and Action Research. They are categorized into three because of their usage, objective, and audience.

Basic Research

Basic research is also called pure research or fundamental resource. It aims to expand the frontiers of knowledge without regard to a practical and immediate application because it provides hints to any abstract and complicated social issue, such as medical research. The whole process of this research may take up to years for supporting or refuting any concept of what has happened, what has made it happen, why and how it has been, and what implications it will have, etc. “Much basic research lacks practical applications in the short term, but it builds a foundation for knowledge and broad understanding that has an impact on many issues, policy areas, or areas of study. The basic research is also the main source of the tools—methods, theories, and ideas—that all researchers use. Almost all of the major breakthroughs and significant advances in knowledge originated in basic research. It lays a foundation for core understandings and may have implications for issues that do not even exist when a study is conducted” (Neuman, 2014).

Comparison of Basic and Applied Research		
Aspect	**Basic**	**Applied**
Primary audience	Scientific community (other researchers)	Practitioners, participants, or supervisors (nonresearchers)
Evaluators	Research peers	Practitioners, supervisors
Autonomy of researcher	High	Low-moderate
Research rigor	Very high	Varies, moderate
Highest priority	Verified truth	Relevance

Purpose	Create a new knowledge	Resolve a practical problem
Success indicated by	Publication and impact on knowledge/scientists	Direct application to address a specific concern/problem

Source: (Neuman, 2014)

Applied Research

Unlike the basic research, applied research is to find solutions for addressing a particular social issue of concerns for schools, civil society organizations, and government institutes. The applied research is more specific, less time-consuming, and more focusing on immediate results in order to provide result-oriented interventions. Under the applied research, there are other two smaller research types – evaluation and social impact research. The former is the most known as a project or program evaluation, especially for the civil society organization, to figure out if a project or program has been designed and implemented more properly to accomplish its missions and goals. According to the Organization for Economic Co-Operation and Development-Development Assistance Committee (OECD-DAC), five criteria used to assess are relevance, effectiveness, efficiency, impact, and sustainability.

OECD/DAC Criteria	**Key Questions to be addressed**
Relevance	Are we doing the right thing? How important is the relevance or significance of the intervention regarding local and national requirements and priorities?
Effectiveness	Are the objectives of the development interventions being achieved? How big is the effectiveness or impact of the project compared to the objectives planned (Comparison: result – planning)?
Efficiency	Are the objectives being achieved economically by the development intervention? How big is the efficiency or utilisation ratio of the resources used (Comparison: resources applied – results)?
Impact	Does the development intervention contribute to reaching higher level development objectives (preferably, overall objective)? What is the impact or effect of the intervention in proportion to the overall situation of the target group or those effected?
Sustainability	Are the positive effects or impacts sustainable? How is the sustainability or permanence of the intervention and its effects to be assessed5 ?

Source: Chianca (2008) and Australian Development Cooperation (2008)

The social impact research is more known as social impact assessment. Unlike the project evaluation research which can be monitored and administered during, at the end, or after the implementation of the project, the impact assessment is designed and conducted prior to a project implementation in order to measure if this potential project is going to affect social aspects of the constituencies. This assessment is normally a rare event, but it is generally a part of a larger research, called environmental impact assessment.

Action Research

Action research aims to solve a particular problem by involving and using the knowledge from data sources, usually human, for producing the best practice originated from a particular group. Its researchers believe that real and practical knowledge of and from the grassroots group members is the most important for research results and policy recommendations, thus, they involve them closely and directly in the research, especially during the data collection, without much interrupting daily activities. Researchers of other research types are more likely to invite the data sources to be interviewed in a particular place at a given time, but researchers of the action research follow the data sources in their daily activities. Both the action researchers and participants converse together like an everyday conversation, not much like an interview between interviewers and interviewees.

Type of Research: Time

Longitudinal research, cross-sectoral research, and case-study research are all research in this category but they are different in terms of times and cases. Longitudinal research (comprising of time-series, panel, and cohort research) is a research that aims to gather data at multiple points of time in order to provide trackable and comprehensive progresses of a concerned event, project or program, or social relation. Conducting successful longitudinal research takes a lot effort, time, and patience in planning and executing the research. A panel study, for example, is to observe or gather data on exactly the same group of people or organizations across different times, and it is normally so difficult since some people may die or cannot be reached at any time of the study while fund of the research project may be exhausted. Baseline, mid-term, end-line, and impact surveys, as required for project evaluation, are examples of longitudinal studies.

Cross-sectoral research, in a simple word, is a one-time study of an event, phenomena, issue, or social life. The cross-sectoral research, by its nature and approach, is more likely to be exploratory and descriptive than explanatory. This research aims to gather, organize, and analyze data from different cases at one particular point of time in order to create a snapshot. Therefore, it is commonly known for using qualitative data collection techniques, and it is usually the simplest, shortest, and least costly alternative but may rarely capture full social development.

Case study focuses on a single unit, such as one individual, one group, one organization, or one program. The goal is to arrive at a detailed description and understanding of the entity/case. It can result in data from which generalizations to theory are possible (Ary, Donald; Jacobs, Lucy Cheser; Sorensen, Chris; & Razavieh, Asghar. 2010). Case studies use multiple methods such as interviews, observation, and archives, to name a few, to gather data. Educational and psychological researchers have used the case study widely. For example, students in a particular area, such as those in the capital city, are found to practice higher standardized tests and to gain higher overall score. These students can be more ideal subjects for the case study to both learn from their experiences and share the best practices to other students in the city as well as in other areas.

Type of Research: Manipulations

The difference between experimental and nonexperimental research, under the criteria of the manipulation, is the presence and absence of research intervention/manipulation. According to Ary et al (2010), the experimental research involves a study of the effect of the systematic manipulation of one variable(s) on another variable. The manipulated variable is called the experimental treatment or the independent variable. The observed and measured variable is

called the dependent variable. For example, assume a university researcher wanted to investigate the effect of providing online feedback to students immediately following course examinations. Using two sections of economics taught by the same professor, the researcher using a random procedure would select one section to receive immediate online feedback about their performance on test questions; the other section would receive feedback during their next class session (independent variables). The researcher would compare the two sections' exam scores and their final grades in the course (dependent variables). If test scores and final grades were higher than could be accounted for by chance in the section receiving online feedback, the researcher could tentatively conclude that there is evidence the online feedback (treatment or independent variable) contributed to greater learning than the in-class feedback.

Unlike those in the experimental research, non-experimental researchers, according to Laerd Statistics (2017), do not manipulate the independent variable(s). This is not to say that it is impossible to do so, but it will either be impractical or unethical to do so. For example, a researcher may be interested in the effect of illegal, recreational drug use (the independent variable(s)) on certain types of behavior (the dependent variable(s)). However, whilst possible, it would be unethical to ask individuals to take illegal drugs in order to study what effect this had on certain behaviors. As such, a researcher could ask both drug and non-drug users to complete a questionnaire that had been constructed to indicate the extent to which they exhibited certain behaviors. Whilst it is not possible to identify the cause and effect between the variables, we can still examine the association or relationship between them.

Type of Research: Purposes or Findings

Due to its purpose, finding, or nature, the research is categorized into three: exploratory research, descriptive research, and explanatory research. This classification of the research is the most common and relevant to educational and community development contexts.

Exploratory Purpose

Exploratory research is the most common type of the research for an attempt to study and provide initial understanding or familiarity of a phenomenon. It looks into a grey or a new area of focuses, which has not been clearly defined. According to Sopha, Syrom, Oro, Lao (2011), the exploratory research is "usually done for three purposes (a) to satisfy the researcher's curiosity and desire for better understanding, (b) to test the feasibility of doing a more extensive study, and (c) to develop the methods to be employed in any subsequent study. It mainly answers the question of "what". It is mostly in the form of an open-ended questionnaire for business or philanthropic researchers to look identify new areas for growth, alternative courses of action, and prioritizing preference from the correspondents. Responses in words or writing may not be statistically measurable, but they will give you richer quality information that can informatively lead to discoveries of new initiatives or problems that should be addressed (Fluid Survey Team, 2014).

For example,

- Finding how to help public educational services
- Finding what to have for promoting school health policy

Descriptive Purpose

Descriptive research is to describe characteristics of particular individual, group, situation, or event. This research is normally used after the researchers get the first-hand information from some sources, including, but not limited to, and exploratory research. For this descriptive research, the researcher is trying to describe what is happening in more detail, filling in the missing parts and expanding our understanding, and it is also where as much information is collected as possible instead of making guesses or elaborate models to predict the future - the 'what' and 'how,' rather than the 'why'. It is also known as a statistical research and is used to inform detailed trends, frequencies, and meanings of collected data. National census survey, ethnographic survey, and social-economic survey are under this category. It mainly answers the question of "how".

For example,

- Finding the most common issues stopping young children from going to schools
- Finding which school health tools being the most used by different children in local school

Explanatory Purpose

Building on the knowledge from the literature, exploratory research, and descriptive research, the researcher uses an explanatory research, which is an attempt to identify, compare, and explain connections, causes, and effects of different variables. The explanatory research provides meaningful and comprehensive information about why and how one thing affects another and vice versa. If compared with exploratory and descriptive researches, it is not a complete type of research by itself, but it is more useful, related, overlapping, and complementary. It mainly answers the question of "why".

For example,

- Finding out why text book policy is better implemented in those schools than others
- Finding out why school girls are more likely to return books in good conditions

These three most common types of research in development context are interrelated and complementary. The exploratory research focuses on delving into making initial understanding of an event or phenomena in a grassroots community; the descriptive research attempts to deepen knowledge of the issue by comparing variables, trends, and frequencies; and the explanatory research is to have extra knowledge by explaining their relationships, including causes and effects, and concluding "what", "why", and "how" something is going on in a particular grassroots, target community.

Purposes of the Research			
	Exploratory Purpose	**Descriptive Purpose**	**Explanatory Purpose**
Problem identification	Key variables are not defined yet	Key variables are already defined	Key variables and relationships are defined
Possible situations	- Quality of our service is declining and we don't know why. - Become familiar with the basic facts, setting, and	- What have been the trends in organizational downsizing over the past ten years?	- Do buyers prefer our products in a new package? - Test a theory's predictions or

	concerns. - Create a general mental picture of conditions. - Formulate and focus questions for future research - Generate new ideas, conjectures, or hypotheses. - Determine the feasibility of conducting research. - Develop techniques for measuring and locating future data.	- Provide a detailed, highly accurate picture. - Locate new data that contradict past data. - Create a set of categories or classify types. - Clarify a sequence of steps or stages. - Document a causal process or mechanism. - Report on the background or context of a situation.	principle. - Elaborate and enrich a theory's explanation. - Extend a theory to new issues or topics. - Support or refute an explanation or prediction. - Link issues or topics with a general principles. - Determine which of several explanations is best.
	It may be interesting to know where and why teachers are being deployed to different schools.	It is interesting to know what, on a school textbook checklist, has been well implemented and what not.	An interesting area is how differently school boys and girls have so far benefited from the school health policy.

Source: Extracted from Neuman (2014)

Type of Research: Data Collection Techniques

Qualitative Data/Research

Qualitative data collection technique is an research approach or technique to understanding meanings of various forms of social action, strategies, practices, institutions, and the circumstances under which they occur. It focuses more on typicality and generalizability than on frequency and representativeness, more on adequacy than on causality (University of Twente, 2017). The qualitative approach strives to provide, explore, describe, and explain why and how of what is going, and it goes beyond information about what, where, and when. Due to the nature of the qualitative research, it is more difficult to use statistical procedures to measure kinds and qualities, and this research typically focuses on a single person, a few individuals, or a small sample of respondents. It is also dependent on a researcher's personal view and description of a situation, and, accordingly, it might lead to a certain level of bias and subjectivity in the description (Kowalczyk, 2017). It is analyzed by using grounded theory and template analysis, to name a few. Case study and action research are typical examples of the qualitative approach.

Quantitative Data/Research

Quantitative data collection technique, on the other hand, is an approach or technique to systematically and empirically investigate an organization, group, event, and phenomena by developing and using mathematical models, theories, or hypotheses. It attempts to discover patterns and relationships, making predictions, and generalizing results from a sample to an entire population. It uses statistical software programs, such as Excel, SPSS, and STATA, because some statistical tests will be applied. Experiment, quasi-experiment, and longitudinal studies heavily use this quantitative approach.

Key Aspects of Qualitative and Quantitative Data Techniques

In a table below are key differences and similarities of quantitative and qualitative researches, as illustrated and compared according to their topic, literature review, sample, research objective and questions, research methodology, data collection, limitation, data analysis and interpretation, and conclusion and recommendations:

Quantitative and Qualitative Techniques/Approaches		
Quantitative characteristics	**Research process**	**Qualitative characteristics**
- Prediction and explanation	Topic	- Exploration and description
- Major role - Justification for research problem	Literature review	- Minor role - Justification for research problem
- Specific and narrow - Measurable data	Research objective and questions	- General and broad - Individual experiences
- Procedures are clearly standardized or structured - The study can be repeated - Measures are created before data collection - Closed-ended, pre-determined, or standardized questionnaire - More enumerators	Research methodology	- Research procedures are specific to the setting or participants - The study may not be replicated - Measures are created later - Open-ended questions or guide questions with prompt questions during the field work - Fewer interviewers
- The more the better for evidence - Relationship between researcher and respondents is distant/outsider	Sample	- Far fewer, and less strong for evidence - Relationship between researcher and respondents is close/insider.
- Questionnaire - Interview - Observation - Large number of respondents - Surveys and structured interviews - Android tablet - Less in-depth but more breadth of information across a large number of cases (less and shallow information but large number of cases) - Prior designed forms - Spot/back check (quality control)	Data collection	- Guide/interview questions - Text/record-based data - In-depth interview - Focus group discussion - Observation - Contents (video, FB update, and other images) - Fewer cases (in-depth information) - Recorder - Direct/indirect observation (quality control)
- No perfect research - But state why/how your research is still accurate, reliable, valid.	Limitation	- No perfect research - But state why/how your research is still credible, reliable, valid.
- Statistical analysis - Description of trend, comparison	Data analysis and interpretation	- Rich and contextual meanings of the finding

of groups, or relationship among variables - Statistical data analysis, tables, charts and hypothesis testing. - A comparison of result with predictions and past studies - Deductive and experimental		- Analyses by coding and organizing data codes into themes to be presented with a coherent and consistent picture. - Converted the findings into problem trees (root, branches, and fruit), web charts, fish bone, … - Inductive and naturalistic
- Related, logical, and consistent	Conclusion and recommendations	- Related, logical, and consistent

Source: Author, adapted from Gray (2009); Babbie (2010); Sopha et al. (2011); and Gramenz (2013)

There has been no single perfect research so far, and there will never ever be one. Thus, any research nowadays has been mainly a mixed research, for example, by combing key parts of both qualitative and quantitative research approach in order to complement each other in a particular research, especially in exploring, describing, and explaining any phenomena or event.

Steps in Conducting Research

(An extract from Ary et al, 2010)

Different researchers may have the same, different, or similar steps in designing, administering, and reporting the research. Below is an ideal example of 6 steps of conducting research, according to Ary et al (2010), for the community development and the educational sector.

1. Selecting a problem. The first step is to select the problem to investigate. The problem should be consequential enough to warrant investigation. Also, the answer to the problem is not already available, but the means for finding answers are available. Quantitative researchers typically state the problem in the form of a specific question about the relationship between variables. For example, "Do children who are taught reading through the whole language approach score higher on reading achievement than children who are taught reading through phonics?" or "What do teachers know about attention deficit/hyperactivity disorder?" Qualitative researchers begin with a general topic of interest. The problem statement may ask the "why" or "how" of certain phenomena. For example, "How do elementary classroom teachers deal with aggressive children?" or "How do high school students become alienated from their peers?"

2. Reviewing the literature on the problem. Researchers should thoroughly review the relevant literature to gain more understanding and insight into the problem and to determine what research may already have been done. The beginning researcher will likely turn to the literature for help in locating and formulating a researchable problem.

3. Designing the research. The investigator next plans how to conduct research to answer the question. The design is the researcher's plan for the study, which includes the method to be used, what data will be gathered, where, how, and from whom. Quantitative researchers maintain that once this research plan is set forth, it must be followed. Un-hypothesized observed relationships among variables may be reported and proposed as topics for future research, but they should not replace the original intent of the study. In qualitative research, the design is flexible and may change during the investigation if appropriate. The design of qualitative research is thus often described as "emergent."

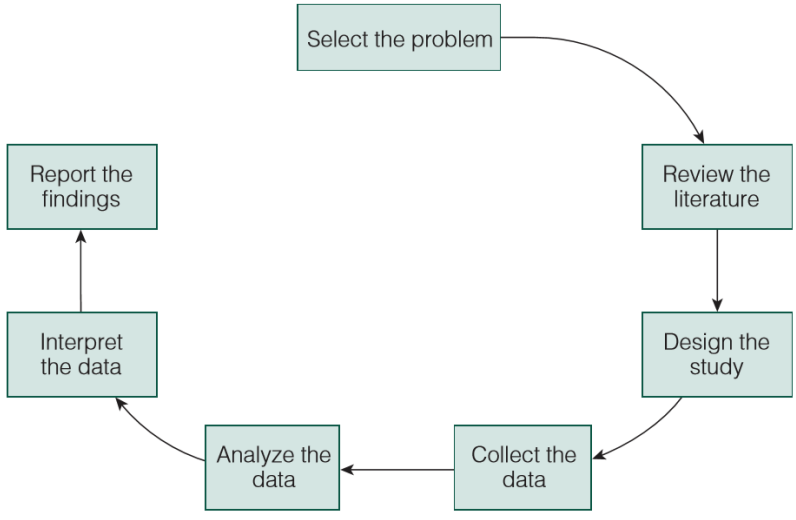
4. Collecting the data. The next step involves executing the research plan. Quantitative researchers use a wide variety of instruments to gather data, including tests, questionnaires, ratings, and attitude scales. Qualitative researchers also have a toolbox of data-gathering techniques, including in-depth interviewing, participant observation, and document analysis.

5. Analyzing the data. The data collected in research must be analyzed. Quantitative data are usually in the form of numbers that researchers analyze using various statistical procedures. Even verbal data, such as compositions written by high school students, would be converted through the scoring process to a numerical form. The analysis of the numerical data in quantitative research provides evidence that supports or fails to support the hypothesis of the study. Qualitative data generally take the form of words (descriptions, observations, impressions, recordings, and the like). The researcher must organize and categorize or code the large mass of data so that they can be described and interpreted. Although the qualitative researcher does not deal with statistics, analyzing qualitative data is not easy. It is a time-consuming and painstaking process.

6. Interpreting the findings and stating conclusions. The researcher next tries to interpret the findings in terms of the research problem. The quantitative researcher typically makes statements about the probability that such a finding is due to chance and reaches a conclusion about the hypothesis. Qualitative researchers present their interpretations and explanations in narrative form. They do not talk about probability but try to emphasize the trustworthiness and credibility of the findings.

7. Reporting results. Researchers must make their procedures, findings, and conclusions available in a form intelligible to others who may be interested.

Graph: 7 steps in the research process



Other Key Elements of the Research

In addition to various research types and other components (such as research topic, research methodology, and data analysis), the researcher needs to take into account of these key cross-cutting research elements: Scope of Study/Unit of Analysis, Literature Review, Level of Measurement, Time Dimension, Reliability, Validity, Communication, and Research Ethics: consent form for interviews or research participation, consent form for photo and digital image, and privacy

Scope of Study/Unit of Analysis

The scope of study or unit of analysis is a boundary or limit, in which a research or a grassroots research needs to be kept, and it may be location, history, product, ideology, book, film, 4-grade classroom, and any other form. It provides answers to the question of "what" and "who" in a study. To have a clearly defined scope of study or unit of analysis of the grassroots research is useful for readers to know what to be included and what to be excluded, for the researcher to exhaustively invest all times and efforts in, and particularly for the researcher to define her/himself against possible questions from critics. In general, to decide a scope of the study, the researcher needs to think about his/her capacity, resource, money, timeline, and importance of the study.

Literature Review

Literature review or desktop review is a key for all research and researcher. Useful documents in this process are project documents, books, laws, policies, journal articles, research reports, etc. Conducting the literature will provide the researcher to benefit from previous work completed by others, and it has been proved to be the most important and relevant if a researcher will conduct a similar study. The literature review will save time and money as well as may necessarily help modifications to particular research planning, methodology, instrument, sampling, and analysis. Information from the literature review may appear in any part of the research proposal or report because it is a cross-cutting component of the research. According to Sopha et al. (2011), the literature review is highly required since it:

- Prevents you from duplicating work that has been done before.
- Helps you to find out what others have learned and reported on the problem you want to study. This may assist you in refining your statement of the problem.
- Helps you to become more familiar with the various research approaches that might be used in your study.
- Should provide you with convincing arguments for why your particular research project is needed.

Triangulation

Triangulation is to look at research data from multiple angles or approaches in order to improve accuracy and reliability of the data as well as its findings. Triangulation is when a number of different data sources and methods are used to compare for analyzing and confirming the research findings. The most common triangulation approach is to use different techniques to get data such as through qualitative, quantitative, and mix data collection techniques. For example, we could compare the perspectives of teachers, students, and parents on the quality of schooling. The integration of quantitative and qualitative research can give us a broader understanding of our research subject. Quantitative research can describe magnitude and distribution of change, for instance, whereas qualitative research gives an in-depth understanding of the social, political and cultural context. Mixed methods research allows us to triangulate findings, which can strengthen the validity and increase the utility of our work (Save the Children, 2014). The second most common approach of the triangulation is to have different observers/data collectors to conduct and administer the data collection. If different people independently and professionally watch, evaluate, and record data from the fieldwork, the findings would be more comprehensive, accurate, and reliable.

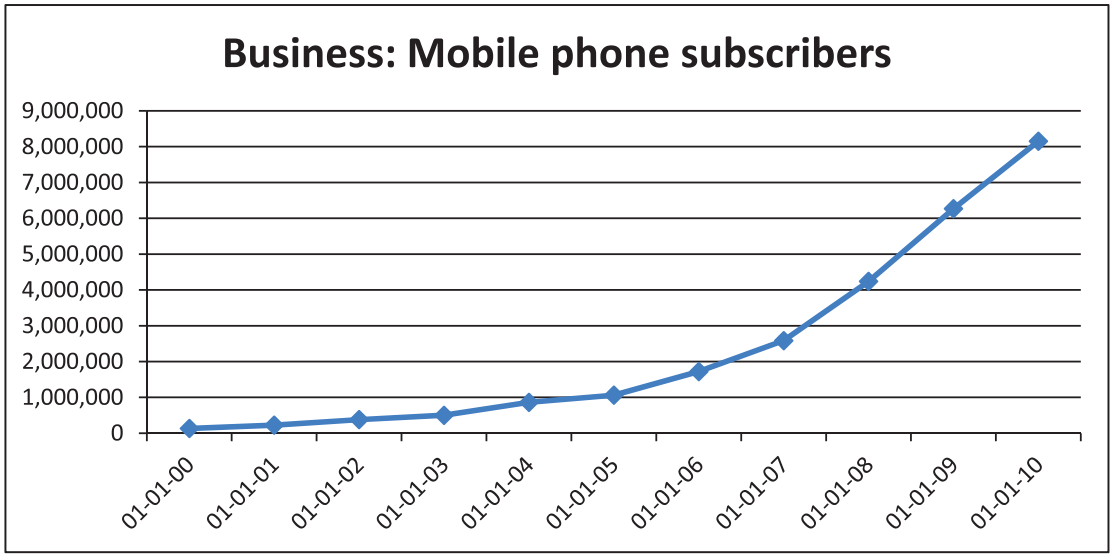
Level/Scale of Measurement or Type of Data/Variable

Level/scale of measurement or type of data/variable is to classify both qualitative and quantitative data from both secondary and primary sources for data organization, comparison, analysis, and interpretation. As given in a Table below, qualitative variables, also known as discrete or categorical variable, are further divided into Nominal and Ordinal variables. This classification does not include another category, which is "Open data", from which data is mostly collected from open-ended questions. The Nominal variable is any variable without any natural order such as name, sex, color, location, etc. Any Nominal variable, which has as only two categories or levels, is also called Dichotomous variable. For example, if we were looking at gender, we would most probably categorize somebody as either "male" or "female". The Nominal variables are most suitable for Bar Chart and Pie Chart. An Ordinal variable is any variable with an existing order such as ranges/levels of satisfaction and ranges/levels of test scores. The ordinal variables are the most suitable for Pie Chart.

Level/Scale of Measurement or Type of Data/Variable				
	Nominal (not rank) - Male/Female - Marital status - Political party - Eye color ***Categorical Data***	**Ordinal** (rank/rate): Levels of opinions, satisfaction, or agreement, etc. ***Categorical Data***	**Interval** - IQ score - Aptitude test - Temperature - No absolute zero ***Numerical data***	**Ratio** - Number of bikes - Weigh in kg. - Income - Age ***Numerical data***
Label	Yes	Yes	Yes	Yes
Order	(no)	Yes	Yes	Yes
Known Difference	(no)	(no)	Yes	Yes
Zero is arbitrary	N/A	Yes	Yes	(no)
Zero means none	N/A	(no)	(no)	Yes
Data presentation	Bar and Pie Charts	Pie Chart	Histogram and Frequency Polygon	

Quantitative variables, also known as numeric, numerical, or continuous variables, are further grouped into two: Internal and Ratio variables. An Interval variable is an ordinal data with an additional property of quantifying differences between each range or variable and without an absolute "zero" value. The variables that fall into this categories are IQ test score, aptitude test, temperature, etc. Ratio data is an interval data with an addition that "zero" has a meaning "none". Age, income, weight, a number of products, a number of customers, etc. are all ratio data. Because properties of both Interval and Ratio data are almost identical, some analytical software programs including Statistical Package for the Social Sciences (SPSS) treat these data in the same way, and they are the most suitable for Histogram and Frequency Polygon.

Frequency Polygon



Source: World Bank (2011)

This Frequency Polygon illustrates a positively climbing trend of mobile phone subscribers in Cambodia over an eleven year period, starting with 1 million in 2000 and increasing to 9 million in 2010.

Reliability

"Do you have a friend or family member who will always help you out if you ask? You'd probably describe this friend as ***reliable.*** Reliability in psychological research isn't really that different - it means that your tools for measuring a given variable measure it accurately and consistently. If you use a rigid ruler to measure the length of your foot, you should always get the same length; this is a measurement that has test-retest reliability," said McNabb. The reliability in social research is an instrument or tool, which is used, if it is needed to do so, at different times, but it still provides consistent and accurate information about the same levels or variations of knowledge, skills, and other traits of data sources or respondents in the survey. This tool or instrument is very important since it can be tested by different researchers, but still, it leads to the same results.

Validity

"A study fails to construct ***validity*** if what it chooses to measure doesn't actually correspond to the question it's asking. Let's say you were doing research that required you to know how intelligent your subjects were. To measure intelligence, you decide to administer a really difficult physics exam. If you did this, your experiment would lack construct validity because a score on a physics exam doesn't really measure intelligence; it just measures whether you've taken physics or not," said Cline. Validity in social research is more about the legitimacy of the research design, data analysis, and conclusion. If compared with reliability, which is more about designing and using the research instrument or tool, the validity is more about selecting and using the most appropriate tool to measure what it is supposed to with the same standard in the data collection and data analysis.

Communications

Accurate, reliable, and valid data come from clear communications among research team members, data collectors, and respondents. In order to have clear communications in the research project, the researcher needs to identify areas of possible miscommunications in the research process and decides what and how to improve them. One of the most obvious examples is the language. If the questionnaire is translated from English to Khmer or vice versa, there may be some lost in the translation. This issue will intensify when data collectors use the questionnaire to interview indigenous people, who may not understand the Khmer well. In order to overcome this issue, the researcher needs to do double or triple tests of the questionnaire (piloting it in the field work) and to readjust it for making it as clear as possible. Furthermore, even in the same language, people may have different perceptions of key words such as "family" and "household". Different people and different research projects may define them differently. Therefore, it is mainly the job of the researcher to make sure that there is no room for miscommunication, and accordingly piloting the questionnaire is highly recommended.

Quality data assurance and control

Assurance and control of the research data are highly necessary for quality data as well as for quality research, which is an organized and systematic way of finding answers to questions. To develop and apply reliable and valid tools and approaches are a part of quality control, thus, both researchers and project owners need to design and pilot their research tools (questionnaires), train their enumerators or data collectors, and plan and execute their data collection field work plans effectively and efficiently. During the data collection process, tracking interviewees, conducting spot and back checks, and additional observation are certainly useful for ensuring quality data from the fieldwork. After the fieldwork, or even during the fieldwork, double data entries, data cleaning, and multiple reviews/tests should be made possible to find or solve, for example, any missing data or error before having the data coded, organized, and analyzed to general research finding, discussion, and conclusion.

Research Ethics

Professional people practicing a particular skill need to understand and implement some particular codes of conducts or ethics. The ethics for those professionals and the researcher are moral standards for the researcher, for instance, to behave especially during face-to-face conversations with the interviewees during the data collection and beyond. Common research ethics are: respect of human subjects, voluntarism, anonymity, no harm, and no deception. Below are also a few other points of the research ethics to be implemented:

Consent Form for Participation

Consent form for the interview is normally a one-page text to inform the respondents about the research project as well as to ask the respondents to voluntarily participate in the data collection process. The form presents research project objective, purpose of the interview (face-to-face conversation), rights of the respondents, confidentiality, anonymity, detailed contact of the researchers, etc. Below are a few excerpts from a consent form, produced by Harvard University in cooperation with Ministry of Education, Youth, and Sports, for a longitudinal evaluation study of World Bank's Scholarship Program, titled "From Schooling to Young Adulthood: Tracing the Dynamic Linkages", in which there were almost four thousand respondents in three provinces (Preah Vihear, Ratanakiri, and Mondulkiri). As an example, a full consent form for the interview, from Harvard University, is attached in the appendix section.

*"**Confidentiality:** Your responses to interview questions will be kept confidential. At no time will your actual identity be revealed. Your real name will not be used and we will only refer to your person with an ID number".*

*"**Participation and withdrawal:** Your participation in this study is completely voluntary, and you may refuse to participate or withdraw from the study without penalty or loss of benefits to which you are otherwise entitled. You may withdraw by informing the researcher that you no longer wish to participate (no questions will be asked). You may skip any question during the interview, but continue to participate in the rest of the study. Your relationship with any school or the Ministry of Education Youth and Sport will not be affected by your decision to participate or not".*

Consent Form for Photo and Digital Image

A consent form for photos and digital images is similar to the consent form for the interview, but it additionally asks for permission to take pictures, record videos, and/or record voices for use in promotional or educational materials. In the form, the respondents agree to authorize the researcher to use these materials without compensation, and they will be properties of the researcher or host organization. A full consent form for the photo and digital image, from Pact Cambodia as an example, is attached in the appendix section.

Privacy

The interview should ideally be between the respondent and a researcher in a quiet location at a house or on its compound as an effort to promote accurate and valid information during the field work. This is also a respect for the respondent, especially in promoting privacy, a state in which the respondent is not being monitored, observed, and interrupted. This should be sincerely discussed at the very beginning of the interview, and other people need to be asked to leave at the time of the interview. The privacy needs to be taken seriously during the data collection because the presence of others during the interview may bring uncomfortable and embarrassed feeling for the data sources. The researcher needs to be extra careful when collecting data in sensitive and personal cases such as human trafficking, rape, domestic violence, drug, corruption, etc.

1. Call for Community Research Proposals

A call for research proposals is an announcement to invite interested groups, especially those in a particular sector such as governance, environment, and education, to send their applications to be considered and officially accepted before a grant will be offered. Interested groups, including civil society organizations in the sector, should carefully review specifications of the research proposal announcement to learn, for example about donors, types of grant, purposes of the grant, what to be allowed and what not to be allowed, and management structure.

In a call for research proposals, with a full announcement attached in the appendix section, by Royal University of Phnom Penh (RUPP) and The 21St Century Cambodian Maritimes Silk Road Research Center (CMSRRC), the announcement describe program background, research objective, research themes, eligibility, funding/research timeline, application deadline/supporting materials, expected project outputs, and contact details.

The research objective aims "to fill in the gap of knowledge on how the contemporary BRI [Belt and Road Initiative] affects politics, economy, environment, and culture in Cambodia, not only at

the national and global levels, but also at the everyday local level which could then translate into knowledge that could better inform policy-makers, civil servants, students, and the public".

After reviewing all specifications, an interested researcher or research organization may weigh its interests, capacity, scope of the study, and available sources before actually starting to write its research proposal. Every component of a research proposal is interdependent and needs to be carefully thought through and carefully planned. This means that an interested organization or researcher knows very well what a research topic is, what key research questions are, how its data is going to be collected, and how the data is going to be analyzed, to name a few.

2. Research Topic

A topic is a short phrase telling the audience what a researcher is interested in doing a research for his or her parts in contributing to identifying and solving one or more social problems. It is a subject area, which is going to be investigated through organized data collection and analysis for additionally providing solutions to other researchers, policy makers, development practitioners, and other interested groups. The topic, usually about one or two brief lines, is simple, succinct, and easy to understand.

A researcher should better choose the most intriguing and interesting topic so that s/he will find a lot of fun and put a lot of efforts in the whole process of research. While there are many good research topics, Gray (2009) warns that the topic should not be too big, too trivial, too technical, unethical, lacking resources, and dependent on the completion of another project.

"There are, essentially, two ways of identifying a research topic. Once is through a literature – books and academic and professional journals – which may raise interesting themes and topics that can be related to your own interests. The other route is directly from the workplace or community setting. Line managers, supervisor or project teams may all require assistance, and this can often be a fruitful source of research focus. In effect, the researcher then acts as a kind of internal consultant to a project team", said Gray (2009).

3. Research Background/Justification

A "Problem Statement" is an important concept in the "Research Background/Justification" section. The problem statement is a short and concise description of a problem or problems that are going to be in the study. It is another way of looking at the research topic from a perspective of a problem, gap of knowledge, or pressing issue to be solved. It forms an essential foundation of the "Research Background or Justification" section, which is a more descriptive and explanatory part of why the researcher chooses a particular topic in an education, business, or philanthropy. It provides information about concerns, conflicts, and challenges of the topic with a background as well as rations for having the topic to be investigated. Linkages among the research topic, research background, the literature, and the call for the proposal, should also be addressed in this section.

Babbie (2010), "the literature will appear early in your research proposal, you should write it with an eye to introducing the reader to the topic you will address, laying out in a logical manner what has already been learned on the topic by past researchers, then leading up to the holes or loose ends in our knowledge of the topic, which you propose to remedy. Or a little differently, your review of the literature may point to inconsistencies or disagreements to be found among the existing research findings".

Usually, the background/justification of the research describes (a) linkages among the problem statement, the calls for the research proposal, and the researcher's interests, ability, and resources; (b) definitions of major concepts and terms; (c) evidence that supports the existence of the problem; (d) evidence in literature about an existing and contrasting trends about the problem; (d) a clear description of unit analysis; (e) a detailed explanation of level of measurement of key variables; and (f) empathizing statements about the need to do a new research.

4. Research Objective/Purpose

Research objective/purpose is a short statement or paragraph telling precisely what a researcher would like to see answered in the research. Designing research objective/purpose is similar to designing an objective or purpose of other projects because the researcher needs to take into account of a SMART concept of Specific, Measurable, Attainable, Relevant, and Timely. Furthermore, the research objective usually responds to the following questions:

- What does a researcher want to study specifically?
- Why does a researcher want to study it?
- How will research results be significant and relevant to others?
- Will the research contribute to the community development?
- Will the research findings confirm or challenge any social theories?

The Research objective/purpose has normally following forms:

- The objective of this research is to….
- The purpose of this study is to…

Action words for qualitative-based research are: explore, understand, develop, clarify, evaluate and discover, while action words for quantitative-based research are: relate, compare, contrast, investigate, determine, describe, assess, and evaluate. However, the researcher should not look at these individual words in isolation to decide if a research is a qualitative or quantitative one because the research is a systematic inquiry to investigate the issue and find solutions, therefore, it should be reviewed in comparison with other elements of the research. Furthermore, most researches currently use a mixed research approach, employing both quantitative and qualitative forms.

5. Research Questions

"A research question is a clear, focused, concise, complex and arguable question around which you center your research. You should ask a question about an issue that you are genuinely curious about", according to Hung and Popp, Learning to Do History Research: A Primer How to Frame a Researchable Question.

After having a topic, background/justification, and objective/purpose, the researcher should now identify one or two key research questions, which will be engaged and expanded further throughout the research processes. The question is a well-articulated one, which should not be for an inquiry to have a simple fact at the surface of the issue. It is central to the whole research project by providing visionary information about your research project focus, its scope, and your motivation. It will help set boundaries for the researcher in defining their data, data collection, and research methodology as well as data analysis.

Sample Research Questions		
Clarity	**Focused**	**Simple vs. Complex**
Unclear: Why are social networking sites harmful?	***Unfocused***: What is the effect on the environment from global warming?	***Too simple***: How are doctors addressing diabetes in the U.S.?
Clear: How are online users experiencing or addressing privacy issues on social networking sites like MySpace and Facebook?	***Focused***: How is glacial melting affecting penguins in Antarctica?	***Appropriately complex***: What are common traits of those suffering from diabetes in America, and how can these commonalities be used to aid the medical community in prevention of the disease?
The unclear version of this question doesn't specify which social networking sites or suggest what kind of harm the sites are causing. It also assumes that this "harm" is proven and/or accepted. The clearer version specifies sites (MySpace and Facebook), the type of harm (privacy issues), and whom the issue is harming (users). A strong research question should never leave room for ambiguity or interpretation.	The unfocused research question is so broad that it couldn't be adequately answered in a book-length piece, let alone a standard college-level paper. The focused version narrows down to a specific cause (glacial melting), a specific place (the Arctic Circle), and a specific group that is affected (penguins). When in doubt, make a research question as narrow and focused as possible.	The simple version of this question can be looked up online and answered in a few factual sentences; it leaves no room for analysis. The more complex version is written in two parts; it is thought provoking and requires both significant investigation and evaluation from the writer. As a general rule of thumb, if a quick Google search can answer a research question, it's likely not very effective.

Source: Adapted from: George Mason University Writing Center (2008)

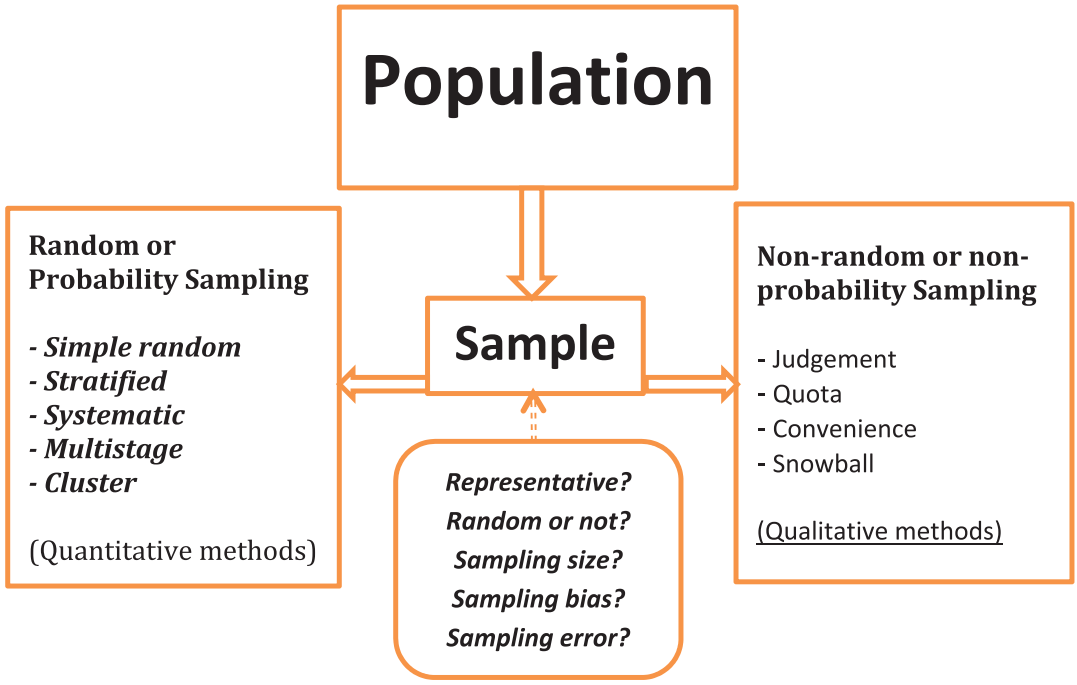
6. Sampling and Methodology

Two essential sections under this sub title – (A) Population and Its Sample and (B) Research Methodology – are lengthy. They are under the same title because the two are the most related and interdependent. Population and Its Sample sub section is about data source or respondents, and it is more about how to get a right sample out of the whole population in a particular scope of study or target area while the Research Methodology section is more about how to design research instrument, tools, and approach to communicate with the data sources and collect the data during the field work.

A. Population and Its Sample

Population is each and every person or thing providing information during data collection process in a particular scope of the study such as product, unit, location, or country. If the population, such as a small group of students in a class, is relatively small, it is better to include all the students in the survey without having to select a sample, which is a selected sub-group of all students. But if the population, such as all people in a province or a country, it is comparatively too large, except for consensus or referendum surveys.

Nevertheless, to get opinions of the population, researchers and statisticians have devised a few key approaches in selecting a selective sample from a large population with a hope that their opinions are significantly reflecting the opinions of almost all, if not all, the population because the research is more about making conclusions or inferences to the whole population, not just reflecting those in the sample.



A diagram above illustrates how a survey sample is selected from a population through either random or probability sampling or non-random or non-probability sampling. In either way, the researcher needs to be objective so that the sample will be the most representative of the population. Furthermore, the researcher also takes into account of sampling size, sample bias, and sampling error.

Approaches to Select a Sample

"A sample will be chosen by a researcher on the basis that it is a representative sample of the population as a whole, that is, the sample's main characteristics are similar or identical to those of the population," said Gray (2009).

Sampling is a process of selecting a survey sample, which is needed in almost all research because to collect data from a large population is normally impossible because of time, budget, workload, and other constraints. The sample is needed in any type of the research. Two options for selecting a sample are random or probability sampling and nonrandom or nonprobability sampling. The first option of the sampling, after having a sample frame, is to employ mathematical probability so that every individual of the population has an equal chance of being selected to be in the survey. It is more suitable for having a random sample from a relatively small population by, for example, selecting 90 % of students in two 6-grade classrooms in a primary school.

Below are key descriptions, advantages, and disadvantages of the random sampling, which is the most appropriate for quantitative data collection techniques.

Technique	Definition/ Explanation	Advantages	Disadvantages
Simple random	Sample group members are selected in a random manner	Highly effective if all subjects participate in data collection	High level of sampling error when sample size is small
Stratified	Representation of specific subgroup or strata	Effective representation of all subgroups Precise estimates in cases of homogeneity or heterogeneity within strata	Knowledge of strata membership is required Complex to apply in practical levels
Systematic	Including every Nth member of population in the study	Time efficient Cost efficient	High sampling bias if periodicity exists
Multistage	Sampling conducted on several stages	High level of flexibility at various levels	Complex to conduct Impacted by limitations of cluster and stratified sampling methods
Cluster	Clusters of participants representing population are identified as sample group members	Time efficient Cost efficient	Group-level information needs to be known Usually higher sampling errors compared to alternative sampling methods

Source: Research Methodology (2017)

In contrast to the random, the nonrandom or non-probability sampling is to select the survey sample because of the researcher' judgment and the respondents' willingness to participate. One of the most common types of the nonrandom sample is called a *convenience* sample – not because such samples are necessarily easy to recruit, but because the researcher uses whatever individuals are available rather than selecting from the entire population (Herek, *A Brief Introduction to Sampling*). Below are key descriptions, advantages, and disadvantages of the nonrandom sampling, which is the most appropriate for qualitative data collection techniques.

Technique	Definition/ Explanation	Advantages	Disadvantages
Judgement	Sample group members are selected on the basis of judgement of researcher	Time efficiency Samples are not highly representative	Unscientific approach Personal bias
Quota	Sample group members are selected on the basis of specific criteria	High level of reliability than random sampling Usually cost-effective	High level of subjectivity Difficult to estimate sampling error
Convenience	Obtaining participants conveniently with no requirements whatsoever	High levels of simplicity and ease Usefulness in pilot studies	Highest level of sampling error Selection bias
Snowball	Sample group members nominate additional members to participate in the study	Possibility to recruit hidden population	Over-representation of a particular network Reluctance of sample group members to nominate additional members

Source: Research Methodology (2017)

Sample size

A sample size is a number of the data sources, such as 70 packages of a product, 90 students, etc. Several factors potentially influence a decision to ahead with the sample size are population, capacity, resources, research type, methodology, data analysis, time frame, funding, etc. Regardless of any decision on the sample size to be used, the researcher should explain thoroughly why that sample size is the most appropriate.

To decide a sample size for a qualitative research, for example, is much more subjective than a quantitative one because the qualitative researcher has normally some more knowledge of the respondents prior to conducting the field work. The chance to have a bias or under-representation sample might happen if the researcher does not maintain sufficient objectivity. With fixed resources which are always the case, the qualitative researcher may choose to study a smaller sample size or a bigger sample by using nonrandom sampling approach.

For a quantitative survey, the researcher may use different formulas to calculate in order to get a sample size for a survey. Below are several formulas to be used for calculating a sample size for the quantitative data collection approach:

A. Slovin Formula

The Slovin's Formula: n=N/(1+(N* e2); where n=sample size, N=population, e=margin of error .

n (sample size) =	171
N (number of population) =	300
e (margin of error) =	0.05

Source: Statistics How To (2017) http://www.statisticshowto.com/how-to-use-slovins-formula/

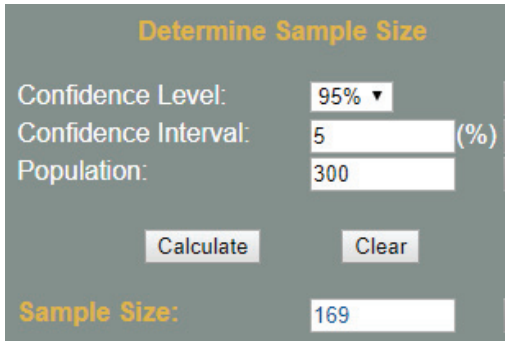
When we say that results are significant at the .05 level, we mean the following (Neuman, 2014):

- Results like these are due to chance factors only 5 in 100 times.
- There is a 95 percent chance that the sample results are not due to chance factors alone but reflect the population accurately.
- The odds of such results based on chance alone are .05, or 5 percent.
- One can be 95 percent confident that the results are due to a real relationship in the population, not chance factors.

B. MaCorr Research

$$ss = \frac{Z^2 * p * (1-p)}{C^2}$$

Z = Z value (e.g. 1.96 for 95% confidence level)
P = percentage picking a choice, expressed as decimal (0.5 used for sample size needed)
C = confidence interval, expressed as decimal (e.g. 0.04 = ±4)



Source: MaCorr, http://www.macorr.com/sample-size-calculator.htm

C. Other Formulas

Below are additional sources for extra tests in consideration of calculating and selecting any formula to mathematically get the sample size most suitable for a survey:

- Creative Research System. https://www.surveysystem.com/sscalc.htm
- National Center for Biotechnology Information. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2876926/
- Raosoft. http://www.raosoft.com/samplesize.html
- Survey Monkey. https://www.surveymonkey.com/mp/sample-size-calculator/

Sampling Bias

A sample bias is a tendency favoring internationally and unintentionally a particular group of the research sample. Three obvious sampling bias are wrong survey sample, full participation of one sub-group of the sample, and nonresponse rate. All the three can be overcome by careful design of the research plan and meticulous data collection during the field work. For the response rate, the researcher should be aware that, provided everything else is equal, the more response rate, the less chance of sampling bias. In general, a self-administered survey is highly unlikely to have more respondents while a face-to-face interview is highly likely to get more participations.

Below is an additional expectation of survey response from existing literature.

No	Survey distribution	Good response	Very good response
1	Mail	60%	70%
2	Phone	80%	>80%
3	Email	50%	60%
4	Online	35%-40%	>40%
5	Classroom	50%-60%	>60%
6	Face-to-face	80%-85%	>85%

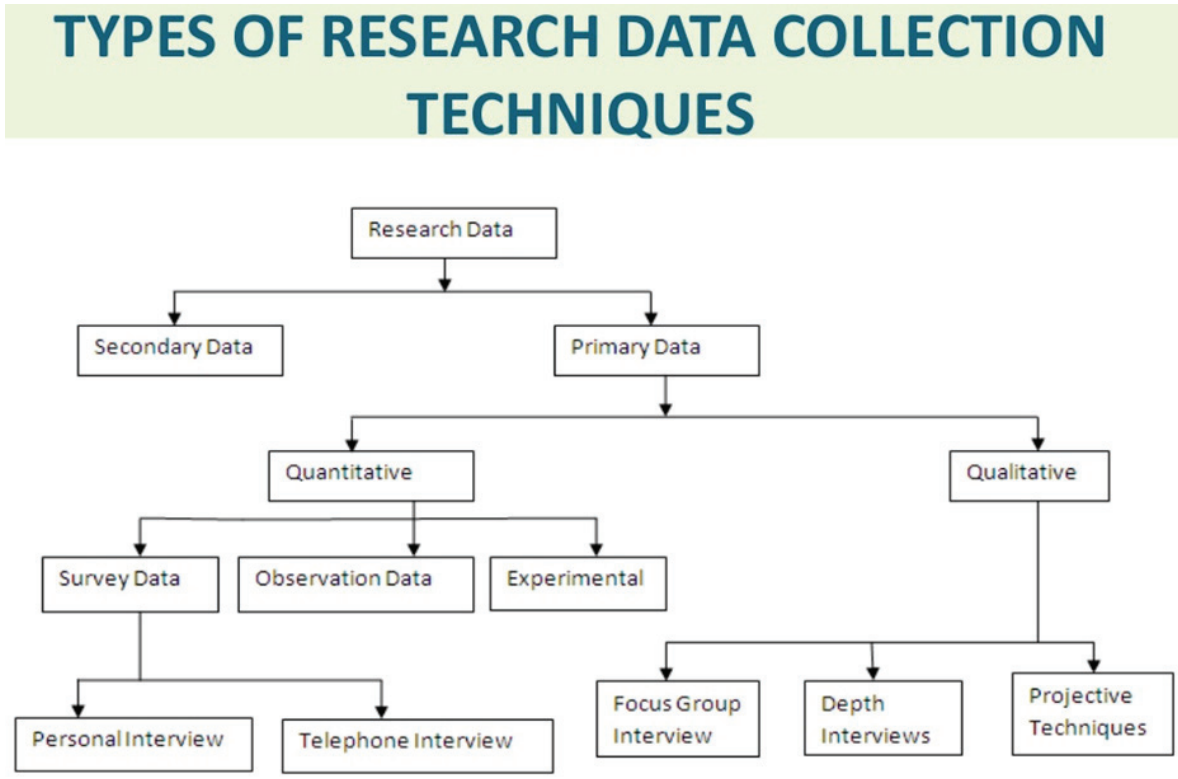
Other common forms of sampling bias in education sector may also include gender, ethnic, cultural, economic, or well-connected biases.

Sampling error

A sample is expected to mirror the population from which it comes, however, there is no guarantee that any sample will be precisely representative of the population because chance may dictate that a disproportionate number of untypical observations will be made (Education Center, *Information sheet 16: Education Centre*). A sampling error is any difference of estimates or values of a sample and the whole research population. A few key factors contributing a sampling error is sampling bias, sample frame, response rate, or chance. Sampling errors, however, can be controlled by careful survey sample designs with an inclusion of larger samples and an implementation of multiple contacts to the respondents so that more response rate will increase.

B. Research Methodology

Research methodology is a "how to" section of the research. It is particularly designed and detailed enough in your particular research so that other people would understand exactly what this research methodology is and how it is going to be implemented from one to another step. It is also highly recommended to include why a particular research methodology is preferred over the others. It is usually a lengthy part of a research proposal, presenting a description of the work to be done in order to get informative answers for contributing to identifying and solving social problems.



Source: Kumar (2014)

In a figure above, research information/data comes from two sources: secondary data and primary data. The former is from existing database, media reports, research, laws and policies, historical data and information, census, personal records, photos, video, etc. The data from the secondary sources can be either qualitative or quantitative. The latter is from conducting the field work, designed for a concerned research objective and purpose. To get qualitative data, the researchers will use qualitative research techniques, which include, but does not limit to, focus group interviews, in-depth interviews, and projective techniques. To get quantitative data, the researchers will use quantitative techniques, which include, but does not limit to, survey, observation, and experiment.

Quantitative research techniques or approaches use close-ended questionnaires, standardized measuring instruments, and the kinds of observation schedules that involve counting the number of times an event or activity occurs. For existing instruments, details of research methodology need to be provided of how and why they are developed, their use in other research projects, and

how they have been validated. But if developing new instruments, detailed descriptions need to be provided of how they have been piloted and validated (Gray, 2009).

Qualitative approaches could include open-ended questionnaires for the data collection and observation schedules. While it may be possible to make use of instruments that have already been developed, it is more likely that qualitative researchers will construct their own data collection instruments. Just like quantitative data collection instruments, it is important to describe how the instrument was constructed and validated. A part from questionnaires, a qualitative data collection process also includes the use of interview and observational schedules, documents, journal and diaries and non-written materials such as photographs and video recordings (Gray, 2009).

Research methodology should strongly link with other main aspects of research questions, sampling, data collection, and data analysis because doing so would allow the researcher to thoroughly tie all key components together. For example, it would be so weird for a researcher to start thinking about data entry and analysis in isolation or only after doing the field work.

7. Data Collection

A researcher should be able to realistically design the most suitable research tools and approaches to get the information. The research tools are answers to the question of "what" to be used for the data collection. The research tools are simply tools such as questionnaire, guide/interview question, procedure, and other equipment, especially for conducting an experiment, if that is the case. The approaches of the data collection are answers to the question of "how" to get the information by using the research tools. They include interviews, focus group discussions, observation, survey, video, etc.

The researcher uses both research tools and approaches to get either secondary or primary data during the data collection process. This section is strongly linked to research questions, methodology, and sample. Furthermore, the data collection is the only direct contact between the researcher and data sources. For the secondary data, particularly for those who do not have resources (time, money, or official permit/visa) to do the field work, the researcher may depend on secondary or existing data sources such as journals, articles, academic records, databases, videos, images, and other trustworthy documents for relevant information or data to be coded, organized, and analyzed in the research report. Colleagues, supervisors, funders, or educational program directors may become more useful for tipping reliable documents for a particular research.

For the primary data, the researcher facilitates survey, interview, and focus group discussion to collect the information. If the data sources are human, before getting their opinions, the researcher needs to have each respondent sign a consent form, which describes the project as well as its purpose and clearly informs the participants about their voluntary and participatory rights. The consent form is to prove that the researcher actually does his job and implements his field work from the utmost ethical and professional manners. Copies of the forms should be kept with by respondents and the researcher.

To get accurate, reliable, and valid data from the primary data sources, all people involving in the research process need to comprehensively understand the project well. If some people such as data collectors (enumerators, field supervisors, in-depth interviewers, focus group moderators, …) need to be trained, they should receive training before conducting their field work.

A. Questionnaire

A questionnaire is a document full of instructions, questions, tests, and other elements designed to collect data for analyses. There are two types of questionnaire: open-ended and close-ended. A list of open-ended questions, which are called guide or interview questions, is listed in a question format without prior-designed answers, and the answers are to be filled by the researchers or respondents themselves in the field work. This type of the questions are the most suitable for qualitative data collection such as key informant interview, in-depth interview, and focus group discussion. A list of close-ended questions is called a questionnaire in which the respondents are asked to select an answer(s) from among a list prior-provided by the researcher. The close-ended questions are popular for quantitative data collection such as online survey and field work interview because they provide a greater uniformity of responses and are more easily processed in data entries, organizations, and analyses than the open-ended questions (Babbie, 2010). Differences between qualitative and quantitative approaches have already been addressed in the "Key Aspects of Qualitative and Quantitative Researches" section.

Forms and designs of the guide questions and questionnaires are various, but all are consistent with the research topic, objectives, questions, methodology, and data analyses. Moreover, key demographic factors or variables such as sex, age, location, occupation, work place, education, income, and years of work experience, are backbones in the research questions. For any types of research questions, they need to be piloted in a real field work. For a big project, in which there are thousands of interviewees, its piloting process and prior training may take months so that everyone in the process is more comprehensive of what to do before, during, and after the data collection.

In addition to other types of questions, here is a question type in Likert Scale:

Agreement	1. Strongly disagree	2. Disagree	3. Slightly disagree	4. Undecided	5. Slightly agree	6. Agree	7. Strongly agree		
	1. Strongly disagree	2.	3.	4. Undecided	5.	6.	7. Strongly agree		
Frequency	1. Never	2. Rarely/ Seldom	3. Sometimes	4. frequently	3. Always	6. All the times			
Opinion	1. Unimportant	2. Undecided	3. Important	4. Very important					
	1. Very satisfied	2.	3. No opinion	4	5. very satisfied				
Quality	1. Not good at all	2.	3.	4.	5.	6.	7.	8.	9.	10. Excellent
Skills	1. No improvement at all	2.	3.	4.	5.	6.	7.	8.	9.	10. Role model

B. Interview

An interview is a face-to-face question and answer session between a researcher, as the one who collects the information, and a respondent, as the one who provides the information. The interviews are a far more personal form of data collection than online survey is. Sopha et al. (2011) claim that the interview involves questioning respondents especially if additional information is needed in the field work. There are two different types of interview approaches, namely, an unstructured or unstandardized interview by using open-ended guide questions and a structured or standardized interview by using closed-ended questionnaire.

C. Focus group discussion

A focus group discussion or group interview is a discussion by a few moderators, as the researchers, and a small group of correspondents, most probably eight people, who have various levels of knowledge about a particular subject. The focus group discussion is an excellent example of using an unstructured or unstandardized interview approach.

8. Research Results/Findings

"There are three types of lies -- lies, damn lies, and statistics", said Benjamin Disraeli, the 19th century British Prime Minister (Goodreads Inc, 2017).

This quote is a reminder to all social workers, development agencies, and researchers in any part of the world to be more careful with statistical survey findings, which are results of the research design, field work, and data analysis/interpretation. Efforts need to be made to ensure that both quantitative and qualitative data are correct and accurate to the best knowledge of both sources (respondents) and data collectors.

First, research instruments and tools such as research proposal, research methodology, questionnaire, and guide questions are together highly relevant and consistent, and all data collectors (enumerators, group discussion moderators, and field supervisors) need to be trained to be the most familiar with the research, research tools, and field work, particularly how to get reliable and valid data, and how to support each other if there is any issue requiring immediate actions during data collection.

Second, both distant and in-person interactions between data collectors and the data sources are ethical, acceptable, and sincere. A few approaches to enhance reliable and valid data from the data sources are tracking respondents and conducting spot and back checks as a part of the quality control. Any issues coming out of these tasks need to be reported immediately to field supervisor and researcher or project leader for taking considerable efforts to exhaustively get data from the sources.

Third, during and after the field work, the researcher has to employ some techniques to help verify accurate, reliable, and valid quantitative and qualitative data, which have already been briefly discussed in the "Key Aspects of Qualitative and Quantitative Researches" section.

A. Quantitative Data

Before entering data into Excel or any analytical software spreadsheets, the researcher or quality data controller needs to make extra checks if any information or data from the field work is

unclear, blank, misleading, or even missing. If this is the case, immediate actions should be taken, and the researcher may call or go back to the same interviewees to confirm the data if that will still be relevant and helpful. In any case, if there is no data for a few particular questions from a number of attempts, the researcher will need to decide if those questionnaires need to be dropped out or if additional types of variables could be created.

After all, answers are filled in the questionnaires, the researcher uses a double data entry approach, in which two groups of data entries independently and separately enter data from the questionnaires onto Excel spreadsheets, and later all the data will be compared to verify if the data match each other or not. If they do not, at least one among the two must be wrong. If that will be the case, the researcher will need to take action to verify and make corrections in order to get accurate, reliable, and valid data for the data analysis.

With the data on a final spreadsheet, the researcher, before actually analyzing and interpreting the data, needs to check and test data properties either by hands or with the help of Excel functions, if there is any outliers or odd data, by comparing their means, modes, medians, cross-tabulations, frequencies, and other forms of hypothesis tests. Nevertheless, to do that with the help of the Excel, hundreds of hours, depending on how big the survey is, will not go to waste.

Basic Statistical Tests for Quantitative Data				
	Nominal ***Categorical Data***	Ordinal ***Categorical Data***	Interval ***Numerical data***	Ratio ***Numerical data***
Mode	Yes	Yes	Yes	Yes
Median	(no)	Yes	Yes	Yes
Mean	(no)	(no)	Yes	Yes
Frequency Distribution	Yes	Yes	Yes	Yes
Range	(no)	Yes	Yes	Yes
Add & Subtract	(no)	(no)	Yes	Yes
Multiply & Divide	(no)	(no)	(no)	Yes
Standard Deviation	(no)	(no)	Yes	Yes

Mean: Mean is technically called an “Arithmetic Mean”, which is simply known as “Average” in a common, daily language. Mean or Average is calculated by adding all values or numbers of the observations together and having all the values be divided by the number of observations. Here is a formula to get the Mean:

$$\overline{X} = \frac{\sum X}{N}$$

With this formula, the Mean or Average of classrooms and classes per school in Banteay Meanchey, Battambang, Kampong Cham, Kampong Chhnang, Kampong Speu, Kampong Som, Kampot, and Kandal provinces are 5 and 7, respectively.

Mode: Mode is the most frequent values or numbers among all the observations. The researcher needs to arrange and review each and every values to see which one has the most appearances. In the Table below, the Modes of staff per school and buildings per school in these eight provinces are 9 and 1.6 respectively.

Median: Median is a middle value or number of an ascending or descending series of a number of the observations. In the example below in the Table, the Medians of pupils per school and teachers per school are 241 and 8, respectively.

Cross-tabulation: Cross-tab is a shortcut for a cross-tabulation, which is an illustration in a table showing at least one variable with other attributions to present rich information or relationship among all related variables or values. The whole tables on "Indicators on School by Province" and "Basic Statistics Test" are each a very good example of the cross-tab.

Indicators on School by Province							
Province	Pupils per School	Teachers per School	Staff per School	Buildings per School	Rooms per School	Classroom per School	Classes per School
Banteay Meanchey	180.9	6	7.2	1.5	6	4.2	5.5
Battambang	224	6.5	8.2	1.6	6.5	4.9	6.7
Kampong Cham	280.1	7.4	9.5	1.8	7.8	5.7	7.3
Kampong Chhnang	252.5	7.6	9	1.8	7.6	5.2	6.9
Kampong Speu	293.8	7.6	9	2	8.8	5.5	7.1
Kampong Thom	197.1	5.8	6.7	1.6	6.4	4.3	5.8
Kampot	229.7	7.8	9.4	1.7	7.6	5.2	6.3
Kandal	322.5	9.6	11.6	2.2	9.9	6.7	8.7
COUNT	8	8	8	8	8	8	8
MIN	181	6	7	2	6	4	6
MAX	323	10	12	2	10	7	9
RANGE	142	4	5	1	4	3	3
MEAN/AVERAGE	248	7	9	2	8	5	7
MODE	#N/A	7.6	9	1.6	7.6	5.2	#N/A
MEDIAN	241	8	9	2	8	5	7
SUM	1,981	58	71	14	61	42	54

Source: Author, adapted from Ministry of Education, Youth, and Sports (2016)

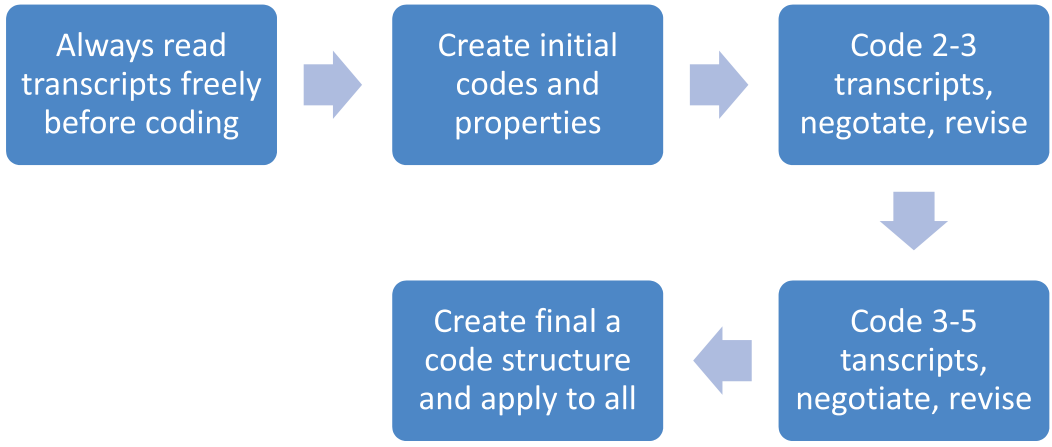
Frequency: Frequency count is a table showing how many times or frequently a particular value in any range or observations occur. A frequency count or distribution is fundamental for creating other illustrations such as a histogram and for comparing mean, median, and mode of the values to see whether or not the values or numbers in the observation are a normal distribution.

B. Qualitative Data

A qualitative data analysis is more intriguing and abstract than a quantitative data analysis is because the qualitative one requires extra care and iterative skills so that no information or even a small note from the field work has been lost or altered during transcription, data entry, data cleaning and coding, data grouping, and data analysis. First of all, the researcher collects and transcribes all digital records onto any analytical software such as Excel, and later the researcher compares information from transcriptions and information on the field notes with the interview guides (guide questions/open-ended questions). The researcher would like to know if the information is collected properly and if it is reliable, valid, and trustful. If there is any insufficient, missing, or weird information, the researcher takes immediate actions to verify the information with the data collectors, data entry typists, and data sources, if needed. But if there is no issue, the researcher will proceed to a next step.

Second, the researcher and data analyst cleans, tests, and codes the data into different categories. Cleaning and testing qualitative data are very similar to verifying and testing quantitative data as the main purpose is to make sure if all data is complete, trustful, and useable. Coding the data is a process of assigning a word or a short phrase to a particular, unique idea of the information from the data source, therefore, there might be dozens of codes, depending on sample size, interview periods, and guide questions. Below is a diagram showing the "Coding" as an iterative process.

Coding Qualitative Data is an Iterative Process



Source: Yale University, 2015

Third, after having all the data and their codes on an analytical software, the researcher or data analyst groups the data according to their themes, and under each theme, there may be a number of sub sets of key points. In an example below, the researcher would like to understand experiences of immigrant doctors coming to study, graduate, and work in the United States. With a research question asking them about their "challenges and advantages" experiences in the US

during their services of practicing their skills. After conducting interviews and coding all transcribed texts, the researcher categorized all qualitative data into three themes: support, medicine, and bias/discrimination, and, under each one, there are a few sub sets of relevant data, as stated below:

Code Structure: Understanding the Experiences of Immigrant Physicians

Research Question: What are the challenges and advantages that international medical graduates (IMG) physicians face in providing patient care within the US health care system?

1. Support
    a. Colleagues/Peers
    b. Mentors
    c. Training/Curriculum
2. Medicine is different in the US/Focus on Professional Experiences
    a. Culture of medicine is different (technology, million-dollar workups)
    b. Patient-Physician interactions (autonomy, decision-making, respect)
    c. Authority relationships
3. Bias/Discrimination
    a. Professional opportunities/promotions/advancement
    b. Subjected to jokes/ridiculous/stereotypes
    c. Feeling of being taken advantages of because you are an IMG
    d. Patients/Families

Source: Yale University

9. Discussion and Analysis

Before starting to discuss and analyze the data and findings, the researchers should again remind her/himself about the types of the research – exploratory, descriptive, or explanatory – and if the data was mainly collected by either quantitative or qualitative approach or mixed ones. If there are mainly quantitative data, the researcher would constantly ask her/himself whether the data and findings are reliable and valid, but if there are mainly qualitative data, the researcher would ask whether the data and findings are credible.

A "Discussion and Analysis" section of the research report is similar to the "Research Results/Findings" section, and in some studies, the researcher may simply combine the two together. To be specific, the Result/Finding part is mainly for the researcher to present how data are coded, organized, and analyzed with visual supports of tables, diagrams, and graphs under particular themes or areas of key questions. All information is from the data collection at the field study, and the explanation by the researcher is within this scope. For the Discussion and Analysis section, the researcher further analyzes and discusses the results/findings in order to support,

compare, and contrast the information in the literature or the hypotheses, which are prior designed for. It mainly goes beyond the scope of those in the sample as the researcher strives to make linkages to the literature and makes inferences to the population as a whole. Be noted that the Results/Findings are about what happened from the data while the Discussion and Analysis section is about how and why it happened and, to what extent, the data is in comparison to the literature.

Discussion and Analysis section should not be a 'dumping ground' for all your research data because most of the data should probably be presented in the Results/Findings and appendices. The Discussion and Analysis section contains summaries of the data that focus on the key findings of the research. Gray (2009) continues that the Result and Discussion section is where you have an opportunity to draw inferences from the results (what do the data mean?), and it looks at the same, similar, and different relationships or themes among variables. What do the results mean in terms of options for actions?

10. Conclusion

A conclusion is a short, consistent, and logical summary of the entire research project, describing very briefly the purpose of the study, research methodology, key research questions, and key findings. Sopha et al. (2011) point out that the conclusion of a study presents a short summary by reviewing what has been done in relation to the problem statement, research question, and research objective. It also provides the opportunity to be anticipated with critical reactions by pointing out the research strengths, weaknesses, and limitations. Gray (2009) provides that the conclusion contains a series of statements that bring together, in a succinct format, what the study has discovered, and it provides a number of remarks that 'round off' the report, or it could mean a 'logical outcome' of the report's arguments. It is not for repeating all data, fact, or finding presentations or presenting news findings or analyses.

11. Recommendation

It is similar to the conclusion in term of being a short, consistent, and logical part of the research report, but the two are entirely different. Some studies are required by the funders to provide recommendations while others not, thus, before planning to work on this section it is better to be sure if it is a required or optional one. The recommendation should logically flow with the results, findings, or evidence collected, analyzed, and presented in the report, so that there should be no sudden surprises for the audiences, and it generally provides some of the most valuable advice for actions to be taken by, for example, the government, policy makers, school directors, teachers, and project leaders. This section should also focus completely on these recommendations and not contain other materials such as data or discussion that has already been presented (Gray, 2009).

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13. The Appendix

1. A Consent Form for An Interview
2. A Consent Form for Photos and Digital Images
3. A Sample of Calling for a Research Proposal
4. An Outline for Writing a Research Proposal
5. An Outline for Writing a Research Report

1. A Consent Form for an Interview

(by Harvard University and Ministry of Education, Youth, and Sport)

Please consider this information carefully. You are invited to participate in a study conducted jointly by the Ministry of Education Youth and Sport, the World Bank, and researchers at Harvard University. This study follows up on your previous participation in this research – maybe you remember. The objective of the study is to develop educational solutions that can be leveraged for the benefit of students in Cambodia's schools.

What you will do in this research: If you decide to participate, you will be asked to participate in an interview. During the interview, you will be asked several questions related to your experience with education. We would also ask you to solve some quizzes and play games on this tablet.

Time required: Your interview will take approximately 45 minutes. Your overall participation will take between 90 minutes to 2 hours, but it is not intended to disrupt your daily schedule. Our research will take about one year overall, but we expect that today will be the only time we contact you.

Risks: No risks are anticipated.

Benefits: This is a chance for you to tell your story about your education. The Ministry of Education Youth and Sport hopes that what they learn from this research will help them improve the learning experience of our country's children.

Confidentiality: Your responses to interview questions will be kept confidential. At no time will your actual identity be revealed. Your real name will not be used and we will only refer to your person with an ID number.

The key code linking your name with your ID will be password protected, and only members of our research team will have access to it. It will be destroyed when the research is complete. The data you share with us may be used as the basis for publications or presentations in the future. De-identified data will be kept for future use and may be shared with other researchers. However, we will never use your name or information that would identify you in any publications or presentations, or when we share data with others.

Participation and withdrawal: Your participation in this study is completely voluntary, and you may refuse to participate or withdraw from the study without penalty or loss of benefits to which you are otherwise entitled. You may withdraw by informing the researcher that you no longer wish to participate

(no questions will be asked). You may skip any question during the interview, but continue to participate in the rest of the study. Your relationship with any school or the Ministry of Education Youth and Sport will not be affected by your decision to participate or not.

To Contact the Researchers: If you have questions or concerns about this research, please contact: [local researcher's name, local address, phone number, and email address]. You may also contact the Harvard researchers supervising this work: Felipe Barrera-Osorio (Associate Professor of Education and Economics) and Andreas de Barros (PhD Student), Harvard Graduate School of Education, Gutman Library 457, Cambridge, MA 02138, USA; adebarros@g.harvard.edu.

Whom to contact about your rights in this research: For questions, concerns, suggestions, or complaints that are not being addressed by the researcher, or research-related harm, please contact: Committee on the Use of Human Subjects in Research at Harvard University, 1414 Massachusetts Avenue, Second Floor, Cambridge, MA 02138, USA. Phone: 617-496-2847 (CUHS). Email: cuhs@fas.harvard.edu.

Agreement:

We will provide you with a copy of this form. Please say "yes" if the nature and purpose of this research have been sufficiently explained and if you agree to participate in this study. Please say "no" otherwise. Please remember that you are free to withdraw at any time without incurring any penalty.

Response: [ ] Yes [ ] No Date: _____

Name (print): _____

2. A Consent Form for Photos and Digital Images

(For Adults, by Pact Cambodia)

I, (*print name*) _____, hereby grant permission to Pact, its employees or representatives, to take and use photographs, videotape and/or digital images of me for use in promotional or educational materials. These materials may include printed or electronic publications, websites, or other electronic communications. I further agree that my name and identity may be revealed in descriptive text or commentary in connection with the image(s). I authorize the use of these images indefinitely without compensation to me. All digital images, prints, digital reproductions and videotape shall be the property of Pact.

"This statement has been read to me in Khmer and by signing this agreement, I am verifying that I understand and agree to the contents."

_____

(*Date)*

_____

(Signature of adult subject)

_____

(Address)

_____

_____

3. A Sample of Calling for a Research Proposal

(By RUPP and CMSRRC)

ព្រះរាជាណាចក្រកម្ពុជា

ជាតិ សាសនា ព្រះមហាក្សត្រ

សាកលវិទ្យាល័យភូមិន្ទភ្នំពេញ

មជ្ឈមណ្ឌលកម្ពុជាសម្រាប់ស្រាវជ្រាវផ្លូវសូត្រសមុទ្រសតវត្សទី២១

Royal University of Phnom Penh

Call for Research Proposals

Cambodia 21st Century Maritime Silk Road Research Center

2016–2017

I. The 21St Century Cambodian Maritimes Silk Road Research Center

The 21st Century Cambodian Maritime Silk Road Research Center (CMSRRC) provides funding to support research programs that overall focus on policy issues, governance, international relations, conflicts, regional security, geo-economics and politics, and the political economy of regional growth in the 21st century Belt and Road Initiative (BRI) context. The objective of these research programs aims to fill in the gap of knowledge on how the contemporary BRI affects politics, economy, environment and culture in Cambodia, not only at the national and global levels, but also at the everyday local level which could then translate into knowledge that could better inform policy-makers, civil servants, students, and the public.

The CMSRRC is calling for research proposals that address the following research themes.

Theme 1: Political and Strategic Program Governance issues of Belt and Road Initiative (BRI) and their Relevancy to Cambodia, 21st Maritime Silk Road and Regional Integration, Maritime Security Cooperation, Strategic Security Issues of Integration,

Theme 2: Economic and Financial Program Economic Implications of BRI for Cambodia, Infrastructure Connectivity Investment, Trade Liberalization and Investments, Tourism industry potentials and their Economic Windfalls for Cambodia.

Theme 3: Social, Cultural and Environmental Program Institutional and People-to-People Connectivity, Green Transformation in agriculture, comparative Environmental and Social Standards and Practices of infrastructure investment, STEM education.

II. Eligibility

The CMSRRC welcomes research proposals from Cambodian researchers with at least two years of experience. Researchers applying for the grant must be able to complete their research project, having all the expected outputs submitted, by August 31, 2017.

III. Funding/ Research Timeline

The CMSRRC will select 4 research projects. Each project can request up to USD 10,000 in funding. The research project should start from November 1, 2016 and finish by August 31 2017.

IV. Application Deadline and Supporting Materials

Applications are due by October 10, 2016. A complete application requires the following documents: CV of lead researcher, completed application form, and a sample research paper.

V. Expected Outputs

Each research project is expected to produce the following outputs:

1. Peer-reviewed Article

This output is essential to CMSRRC as this will indicate the credibility of the research conducted by the Center and to address the outcome intended for boundary partner of academic community. The criteria of successful delivery for this output is that the manuscript is "accepted for review" by the Journal (only the confirmation that the manuscript will be reviewed). The CMSRRC will provide support for reviewing and suggesting improvement of this output, therefore there are stages in the development of this output. The CMSRRC also provides the support in validating the Journal targeted for submission, especially for the purpose of avoiding predatory publishers.

2. Policy Brief

Policy brief is one of the communication tools for the CMSRRC to address the outcomes for the boundary partner of policy makers. The policy brief can also be a tool for policy engagements. The criteria of successful delivery for this output is that at least one policy brief is produced (in Khmer and English) and disseminated to relevant boundary partners. The CMSRRC provides support for reviewing and suggesting improvement of this output, therefore there are stages in the development of this output.

3. Conference Presentation

The CMSRRC will organize an international level conference with representatives from government and non-government institutions at the end of the Research Program's project cycle. Coordinator from each Research Programs will be requested to present findings from their research. The CMSRRC provides support for reviewing and suggesting improvement of this output, therefore there are stages in the development of this output.

4. A Chapter in the CMSRRC's Flagship Research Book

The Coordinator for each Research Program is required to produce a chapter which will be peer-reviewed and publish as part of the CMSRRC's flagship book. The chapter should highlight the relevant policy/ practice issues, how the research program investigated these issues and provides recommendations on these issues. The project has committed to submit one book chapter. The CMSRRC provides support for reviewing and suggesting improvement of this output, therefore there are stages in the development of this output.

VI. Contact

• For further information, please contact Dr. Neak Chandarith, Director of the CMSRRC via neak.chandarith@rupp.edu.kh; chandarithneak@gmail.com.

4. An Outline for Writing a Research Proposal

There is no one best format for writing a research proposal, but below is an ideal outline. (Review this grassroots research manual for more details about these points)

Step 1: Review a call for research proposals, and do literature review

Step 2: Research Topic
Step 2: Research Background/Justification
Step 3: Research Objective/Purpose
Step 4: Research Questions
Step 5: Population and Sampling
Step 6: Research Methodology
Step 7: Data Collection and Schedule
Step 8: Cost and Management Structure
Step 9: Conclusion and Recommendations
Step 10: Reference

Step 11: Appendix

5. An Outline for Writing a Research Report

(By Sopha et al.)

There is no one best format for writing a research report, but below is an ideal outline.

I. Introduction

1. **Introductory Paragraph** is a short introduction to catch the attention of the readers and get them to continue reading.
2. **Statement of the Problem** should state clearly a general problem area and discuss its significance. This can be written in one sentence but with several paragraphs to elaborate and persuade the importance of the problem.
3. **Purpose** should explain what the research or the study intends to accomplish.
4. **Significance of the study** should point out how the study relates to the larger issue.
5. **Research Question or Hypothesis** is clearly stated and is specific about what is predicted. The text should contain the clear relationship of the hypothesis to the research problem and literature review.

II. Background

1. **Review of Literature** is important because it shows previous researches and cited literatures from reputable and appropriate sources. It should be written in a condensed form but in a manner where only the most relevant information is included.
2. **Definition of Terms** should be included in this chapter when appropriate or when the study uses special terms that are unique in the field of study.

III. Methodology

1. **Population and Sampling** should contain the detailed description of the procedure for selecting the sample and the researcher should state and explain what sampling method is used in the study. The population and sampling frame should also be described accurately.
2. **Instrumentation** or data collection methods, tools, and techniques are described in this chapter. Include a copy of the actual survey tools (ex. Questionnaire, interview questions) in the appendix and state it here.
3. **Procedure and Timeframe** should explain when the study starts and when it ends and what procedure will be employed.
4. **Scope and Limitations** are often imposed by time and budget constraints. Describe and list the limitations of the study and explain the extent of its effects on the quality of the research.

IV. Results/Findings and Analysis

1. **Statement of Results** are stated concisely and are plausible for the research described.
2. **Tables** are correctly formatted for accurately and concisely presenting parts of the analysis.
3. **Figure** is clearly designed and accurately describes a relevant aspect of the results.

V. Conclusion and Recommendations

1. **Discuss the Findings** explain if the finding support the existing theories. Present plausible reasons why the results might have turned out the way they did.
2. **Present Recommendations** based on the finding and not on the belief or biases of the researcher that is not supported by the data.

VI. Reference

All citations should be included in the correct format and are appropriate for the study.

VII. Appendix

Include a copy of any actual instruments. If used, include a copy of the informed consent form.