

**Steps of the research process**

**A practical approach**

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### Abstract

The purpose of this research paper is to review the research process in all its steps and show its practice. It begins with a reflection and an overview of important facts of the research process. It is followed by a literature review about the first five of the eight research process steps. The first step is 'Asking Question', a starting point that some authors deal with at the same level as the statement of the problem, which requires clarification. The second step is identifying the important factors, related to the problem or topic, to be considered before the researcher feels prepared to move to the third step which is formulating a hypothesis, and then to immerse in the fourth step of collecting relevant information. The fifth step is where all the data collected will be processed and the hypothesis would be tested. The following three steps will come up with the practice of research at the end of the paper.

## Introduction

To engage in a reflection about steps of the research process, it is necessary to consider some important facts. Sometime people say they do or are doing research, but may not know exactly what research is and what it means. Salkind (2012) says that research is an intensive activity based on work of others, work done before and provides the basis for the study we intend to do; that can be replicated, in the sense that it can be repeated and produce the similar results. Most of the research works are generalizable under the same conditions they were carried, but some may not work in different settings. Good research is based on some logical rationale, is tied to theory and is doable. Good research is incremental, is apolitical, should be for the betterment of the society and generate new questions. This statement is related to the attributes of the research. (P.2).

In addition to the attributes of the research that may lead to quality research, Pereyra (2012) suggests ten qualities of good researcher, which are interest, motivation, inquisitiveness, commitment, sacrifice, excelling, knowledge, recognition, scholarly approach, and integration. He suggests likewise that the characterization and understanding of these qualities would be helpful to the beginners in research activities.

On the other hand, Lynch (2013) defines scientific research as a process that comprise five steps,

“(1) developing an empirically answerable question, (2) deriving a falsifiable hypothesis derived from a theory that purports to answer the question, (3) collecting (or finding) and analyzing empirical data to test the hypothesis, (4) rejecting or failing to reject the

hypothesis, and (5) relating the results of the analyses back to the theory from which the question was drawn”. (P.5).

Most of the time we are so focused on a definition of something that we have no interest in finding out what it is not. In sequence of the discussion about the research process, Lynch (2013) observes that we should know the important statements of what research is not. First, he says that literature review alone is not research, even though it is an important part of the process, because it doesn't add to the research.

The second statement of what research is not is that theory construction or forging links between theories is not research. However, establishing the links between theories is important. The third statement is that data collection and analysis without theoretical grounding and offering no explanation is not research. (P. 6).

The following pages of this paper are going to describe and present some reflection on the eight steps in the research process proposed by Salkin (2012). These steps are: Asking questions, identifying the important factors, formulating a hypothesis, collecting relevant information, testing the hypothesis, working with the hypothesis, reconsidering the theory, and asking new questions.

### **Asking questions**

I came to a point where I got stuck. It was similar to the dilemma of the egg and the hen and which came first. It takes many readings to clear it up. Some authors are not very clear about which comes first, the statement of the problem or the research question. Tuckman (1999) says that “aA research problem, or phenomenon as it might be called in many forms of qualitative

research, is the topic you would like to address, investigate, or study, whether descriptively or experimentally.” (P. 22).

He proceeds stating that it is necessary to narrow down the topic or problem through literature review. This procedure will allow us to identify previous research, and possible gaps in literature. This will make us prepared to come out with good research questions.(Ibid, p. 23) Tuckman (1999) then explains that

“Research question is a way of expressing your interest in a problem or phenomenon.

Research questions are not necessarily an attempt to answer the many philosophical questions that often arise in schools, and they are certainly not intended to be an avenue for grinding personal axes regarding classroom or school issues.” (P. 23).

In addition the author presents five characteristics of a good research question: It is specific, it is clear, it refers to the problem or phenomenon, it reflects the intervention in experimental research, and note the target group of participants. (Ibid, p. 24).

A research has a starting point which is a question formulated in relation to a problem or a curiosity about something. It can also come out of real life, from our imagination and experiences. Questions may be influenced by many factors like art, science, music literature. (Salkind, 2012, p. 5). The research question is sometimes called the problem statement and presents the idea that is going to be the basic line of the study. (Haber, 2013, p. 28).

It is easy to generate questions, but the questions raised may not address the perceived problem, difficulty, doubt or curiosity, as mentioned by Salkind (Ibib). However, Haber (2013) understands that research questions or topics are not pulled from thin air. They should indicate that practical experience, critical appraisal of scientific literature or interest in an untested theory was the base the generation of a research idea. (P. 29).

On the other hand, Farugia & al (2009) understands, in accordance with Haynes (2006) that “interest in a particular topic usually begins the research process, but it is the familiarity with the subject that helps define an appropriate research question for a study”. (P. 278). Likewise, she agrees with Huley et al (2007) that “questions then arise out of a perceived knowledge deficit within a subject area or field of study. (Ibid 278).

The question itself may define what direction the research may take. Questions like why people behave the way they do, how opinions and attitudes are formed, how people are affected by the events that go on around them, how and why cultures have developed in the way they have, and what is the differences between social groups are within the range of qualitative research. Qualitative research asks the why, how and in what way. Quantitative research asks questions like how much, how many, how often, and to what extent. (Hancock, 1998, p.1).

Research is not a small and easy job, and beginners have to be careful when considering their ideas from which they are going to come out with a research question. Based on this, Salkind (2012) advises beginners that falling in love with their ideas is risky. It may make them feel that their questions are so important that they fail to listen to their advisers and whoever that could help them in some ways. He says that sticking to the first idea may lead the beginner to over-intellectualize the importance of their research question. At the end, he/she may feel like getting a bite bigger than what he/she can chew. It may become frustrating to realize it is a study already done before, that besides granting a grade, it was a waste of time and resources. (Pp. 29-30).

There are two questions that should be answered before we definitely state the direction we want to give to our research work. According to Price (2013), we should ask if it is interesting

and if it is feasible. It should be interesting not just to the researcher himself, but primarily if it is interesting to people in general and to the scientific community. (P.34)

To be interesting, the answer to the question cannot be obvious or that has been scientifically answered before. It must be in doubt. The second factor is that the answer will fill a gap. It means that at least part of the question wasn't scientifically answered before. The last factor is if the question has important practical implications, it is going to be helpful in some ways to improve life or solve problems. In terms of feasibility, the answer of the question is evaluated in relation to cost, time, equipment, material, skill and access to participants. Feasibility, in addition to being interesting, is going to be determinant to make a decision if the research based on the question is going to be doable. (Ibid, p, 34).

### **Identifying the important factors**

This is in fact, if not the most difficult, a step that is time consuming and require us to refine our understanding of the implications of the question we have chosen. From here, the factors related to the question will be studied to enable us to proceed to the next step, which is the formulation of hypothesis. The question that will disturb us before the next step is "how" we are going to identify and gather these important factors. At this point we will need to engage the literature review to open, as wider as possible, the panorama of possibilities related to the question we came up with. Salkind (2012) says that the next step after the question is to identify the factors that has to be examined, proposing, as example, a list of the most investigated factors lately: Age and gender of the adolescents; ethnicity; level of family education; access to types of

social media; number of self-identified close friends; parental attitude toward social media; family configuration; and family communication patterns.

Recently, Ejimabo (2015), in his literature review suggested that factors like past experience, cognitive biases, age and individual differences belief in personal relevance, and an escalation of commitment, as well as the influence of what choices people make should be considered in management leadership decision making. However, as for the purpose of his research study he listed the following factors: Education and Experience, belief and Cultural Environment, cognitive biases leadership Influence, politics and policy, technology, age and individual differences, time and change, and communication. (P.3).

In line with the statement above about the large number of factors to be considered in a research, Ejimabo (2015) adds also psychosocial factors like anger, hatred, divorce, death, and other individual challenges and crises that may influence the decision making environment of a management leadership. (P.4)

Therefore, in organizational leadership literature review and other actions to gather information about the appropriate factors that are going to have important role in the process of research may require to expend enormous amount of time, energy and other resources.

“Understanding the process by which leaders and managers make decisions is important to understanding the decisions they make in organization”, says Ejimabo (2015). The decision about factors that may be appropriate for the study we intend to do will depend on great effort in literature review and possible visit to organizations to catch a view of the reality of organizational management leadership. (P.5).

### **Formulating hypothesis**

In chapter 1 of 'Exploring Research', Salkind (2012, p. 2) offers a list of research attributes. Those are procedures that lead to high quality research. In other words, to make a good or high quality research the researcher has to be proactive. A solid and resistant construction is built on solid and resistant foundation. Therefore, a good and solid research topic or problem statement, as well as a clear research question statement will make the hypothesis formulation an easier job. A hypothesis is an objective extension of the question originally posed, explains Salkind (2012). Good hypothesis poses a question in a testable form, good questions lead to good hypotheses, which in turn lead to good studies. (P. 6).

The relationship of the hypothesis with the general problem statement or the question that was the motivation to proceed with the research study is too close. Good problem and question statements are going to help the formulation of hypothesis. That is why taking care and time with that initial question is so important, say Salkind (2012, p. 6).

This discussion is closely related with Tuckman (1999) statement that research hypothesis essentially is a declarative statement of how you expect the research to turn out. He says that

“It should be brief, note your important variables, and suggest something you can test or descriptively investigate. It is typically included in experimental research but is also found in descriptive research such as factor analyses or survey-based investigations. It is not typically included in qualitative research in which the results are intended to be emergent”, (pp.25-26).

It is important to ensure that “your research topic or problem statement, research question, and hypothesis use consistent language regarding variables and any anticipated outcomes” says Taukman (1999, p. 26).

### **Collecting relevant information**

Researching must be carefully designed and all the activities planned beforehand to achieve a higher level of efficiency. Otherwise it may turn to be a very low motivated work due to requiring excess of work and become extremely time consuming. Ejimabo (1999) offers an example of a data collection for a research in organizational management leadership that took 17 months just to be completed. The collection of information selected a sample of 400 hundred full time organizational leaders and managers. (Pp. 8-9).

This study is a good example of the whole procedures involved in a research. It informs about the profile of all participants and procedure to confirm the commitment of each participants to collaborate with the study. The report says that “the informed consent agreement form and the purpose of the research study were explained to the participants at the beginning of each interview”. Researchers used a questionnaire based on qualitative method out of the research questions. It mentions an important perspective of use of the quantitative and qualitative research. It says that “the (quantitative) survey data were collected only as a response to the questionnaire and used to support the qualitative data only in the study”, (Ibid, p. 9). It is an important example of how quantitative method is used in qualitative research. It is a good illustration of how a research gets out of an academic room or office and become real action. It is a source of a great deal of information for those inexperienced first time researchers, who

eventually are going to engage similar procedure in other circumstances, organizations, community and environment.

### **Testing the hypothesis**

Research is the kind of activity that gives no chance to those performing it to avoid any step. Strategy or strategies are established to achieve the searched results and they are going to be accomplished only if these strategies are followed completely. Is it simple enough to collect data that relate to the phenomena being studied? Asks Salkind (2012, p. 8). No, it is not, as we've seen in the Buckman illustration in 'Data Collecting' that took about 17 months. After having gathered all the information related to the problem and the question statements, it is time to test the hypothesis.

What is hypothesis testing? What is its significance? Gravetter (2013) considers the method in which we select samples to learn more about characteristics in a given population as hypothesis testing. He adds that "hypothesis testing or significance testing is a method for testing a claim or hypothesis about a parameter in a population, using data measured in a sample. In this method, we test some hypothesis by determining the likelihood that a sample statistic could have been selected, if the hypothesis regarding the population parameter were true", (pp.232-233).

Gravetter (2013) claims that hypothesis testing method comprises four steps, as follow: Step 1: "State the hypotheses. As the name implies, the process of hypothesis testing begins by stating a hypothesis about the unknown population. Actually, we state two opposing hypotheses.". (Ibid, P. 236).

Step 2: “Set the criteria for a decision. - Eventually the researcher uses the data from the sample to evaluate the credibility of the null hypothesis. The data either provide support for the null hypothesis or tend to refute the null hypothesis”. (Ibid, p. 237).

Step 3: “Compute the test statistic. - The data are collected after the researcher has stated the hypotheses and established the criteria for a decision. This sequence of events helps to ensure that a researcher makes an honest and an objective evaluation”. (Ibid, p. 240).

Step 4: “Make a decision. - It may seem awkward to phrase both of the two possible decisions in terms of rejecting the null hypothesis; either we reject  $H_0$  or we fail to reject  $H_0$ ”, (ibid, p. 241).

There are basically at least two hypotheses in a quantitative research method, the ‘null hypothesis ( $H_0$ )’ and the ‘alternate hypothesis ( $H_1$ )’. “The null hypothesis ( $H_0$ ) states that in the general population there is no change, no difference, or no relationship. In the context of an experiment,  $H_0$  predicts that the independent variable (treatment) has no effect on the dependent variable (scores) for the population” and, on the other hand, “The alternative hypothesis ( $H_1$ ) states that there is a change, a difference, or a relationship for the general population. In the context of an experiment,  $H_1$  predicts that the independent variable (treatment) *does have an effect* on the dependent variable”, Gravetter (2013, p. 236).

### **Poor learning in children’s Christian class**

#### **Research inquiry**

It was noticed in an immigrant congregation that children 6 to 12 years old, born in the United States, are having poor learning in Christian classes taught in their home spoken language. Teachers and leaders feel that it would help if they could figure out what would be

cause or causes behind this fact. These children go to school and have good performance in class taught in English Language. They never studied their home spoken language on regular basis, but speak fluently. Therefore, the research problem statement can be summarized as following: Children's poor learning in Christian class.

### Question statement

Based on the statement of the research problem, the most appropriate research question statement would be: Is the children's poor learning due to the use of home spoken language in Christian class?

The important factors assumed as possible variables that may have some impact in children's learning performance are teaching methodology, obsolete resources and no use of modern technology, poor installations, teachers' preparedness, and motivation factors. It is the understanding of the teachers and leaders that even though all the other factors may have influence in learning, the stronger influence in the learning process may be motivation.

Huitt, (2001) summarizes some theories of motivation with focus on the cognitive aspect of human motivation. He brings to discussion the attribution theory, a cognitive approach that proposes that people offer certain attribution to explain their success or failure, as seen in the following chart:

	Internal	External
No Control	Ability	Luck
Control	Effort	Task Difficulty

It assumes that the individual has control of two attributions, on internal (effort) and the other external (task difficulty). On the other two attributions internal (ability) and external (luck) the individual has no control. Understanding these attributions, educators should assist the student when he experience learning difficulty, explains the author. When the attributions are external, no assistance will be possible.

Other second theory Huitt (2001) lists as contributor to understand leaning motivation is the “Theory of Expectancy”, of Vroom and Tolman. The basic assumptions of this theory is achieving success, being rewarded as outcome of success, and obtaining a goal.

Out of Huitt discussion of these two theories, we believe that there are motivation factors that influence the learning performance. We discarded the second theory, as far as in Christian learning environment there is no focus on success, reward or achieving goals. However, the theory of attributions may apply to the case. We believe that, despite the possibility of improving the children’s effort, which is internal and they have control on it, ability to read, understand and process information in home spoken language may be compromised. They may feel frustrated to see that effort to learn doesn’t help because of their lower ability to deal with the language.

### **Formulating hypothesis**

Based on the research question, the statement of the hypothesis H0 and the hypothesis H1 are as follow:

H<sub>0</sub> – Poor learning is not due to classes in home spoken language.

H<sub>1</sub> – Poor learning is due to classes in home spoken language.

### Data collection

Data collection methodology statement – Two classes will be taught to the children alternating English Language and the home spoken language in different but similar subjects with the same level of difficulty. After each class, a questionnaire on the subject will be applied to the children. The questionnaire contains 20 multiple-choice questions. The class will be formed by a representative sample of 10 children.

### Data collection result

After the two classes, the scores were organized from lower to higher for both tests as shown in table 1.

Table 1 – Data Collection

Participants	Score 1	Score 2
1	10	8
2	13	8
3	14	9
4	15	10
5	16	10
6	16	10
7	16	11
8	17	12
9	18	12
10	18	13

Score 1 – Test in English

Score 2 – Home spoken language

Average:  $\sum \text{score1}/10 = 153/10 = 15.3$   
 Average:  $\sum \text{score2}/10 = 103/10 = 10.3$

Chart 1 – Series 1 English score, series 2 home spoken language score

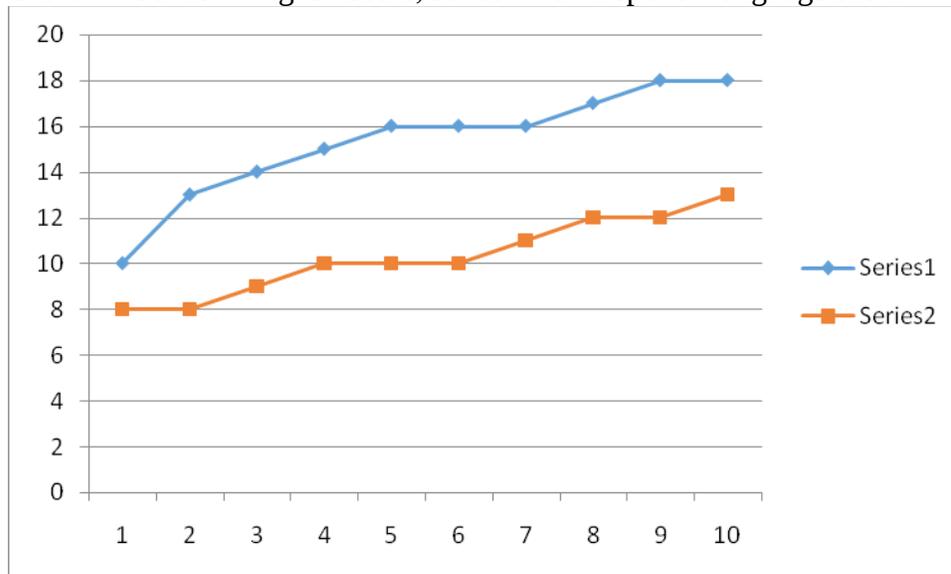
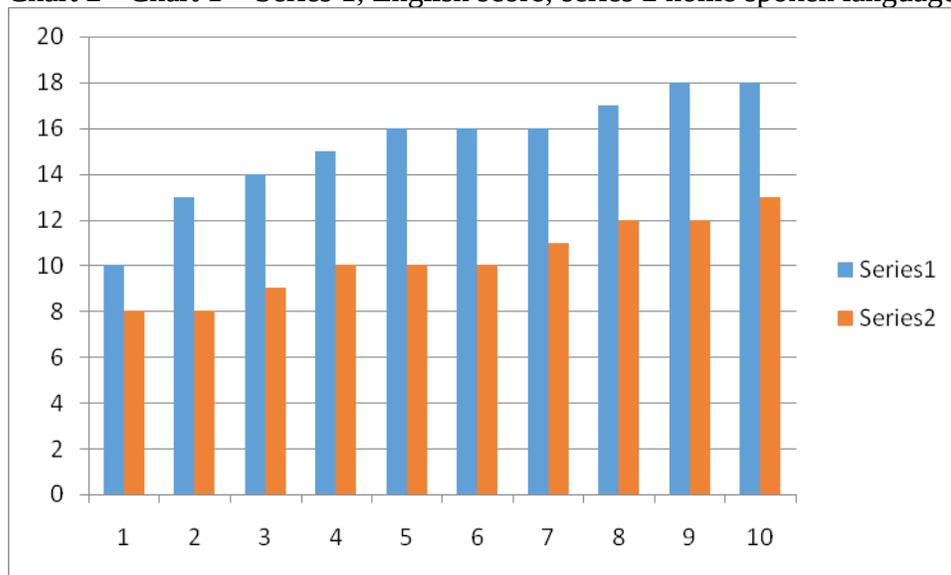


Chart 2 - Chart 1 – Series 1, English score; series 2 home spoken language score



The data collected was organized in table 1 showing the scores in both languages from lower to higher. Score 1 represents the column of score of the test in English Language and score 1 represents the column of score of the test in home spoken language. The average of score 1 resulted in 15.3 and the average of score 2 resulted in 10.3.

**Testing or verification of hypothesis**

H0 – Poor learning is not due to teaching in home spoken language.

H1 – Poor learning is due to teaching in home spoken language.

The data collected and processed show that result score average for the test in English language is 15.3 and the score average for the test in home spoken language is 10.3. Considering that the performance of the class in English is higher that resulted in an average score of 15.3, against an average score of 10.3 for the class in home spoken language, there is an indication that the use of language in class has influences the learning process. According to the result, as the learning performance mean in English class has shown almost 50% higher than the class in home spoken language, the H0 hypothesis is refuted. This result indicates that the H1 statement that ‘poor learning is due to teaching in home spoken language’ is accepted that there is indication that language used in class influences learning performance.

**Conclusion**

A practical exercise forces us to visualize the reality of research activity and let us understand how wide the range of possibilities is. One of the amazing things that we realize is that is that no result is totally conclusive. Even though the hypothesis tested show indication, yet there may be other factors that may act on the subject study and lead to different results depending on circumstances. The research presented here is a study of a population sample to test one variable that has indicated influence in the results of learning.

According to the motivational factors as shown in the literature review, the learning performance may also be considerably influenced by other variables. Therefore, the study stays open for further consideration, and for a larger study involving different congregations, languages and cultures. From this point, new questions would be raised and new studies and review of other theories.

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