

A paradigm shift in understanding mixed method research: A Malaysian perspective

Open
Access

Ahmad Tarmizi Abdul Rahman¹, Romzi Ationg^{1,*}, Nurul Ain Zulhaimi¹

¹ Centre for the Promotion of Knowledge and Language Learning, University of Malaysia, Jalan UMS, 88400, Kota Kinabalu, Sabah, Malaysia

ARTICLE INFO

ABSTRACT

Article history:

Received 22 May 2017
Received in revised form 1 November 2017
Accepted 2 November 2017
Available online 8 November 2017

In this post-modern world defining certain concepts may face 'difficulties' in order to make this concept really relevant to our community. Some definitions given can be irrelevant and of course can be questionable by many of us. This problem arises due to the lack of desire among us to make the concept really fit into its usage. This happens in defining the term 'mixed-method' which is a rapidly emerging research paradigm. Traditionally, the term mixed method is an approach to professional research that combines the collection and analysis of quantitative and qualitative data. The term 'mixed method' appears to be more widely used in operation research than in other branches of humanities and religious studies. However, due to the assumption that every single concept is still open to be more clarified or even to be improved we would like to propose a new look of the term mixed method. This newly proposed concept is basically stood on the 'no completely right definition' to every single term invented on earth. Thus, this concept would bring about improvement and can be geared into a more specific conceptual.

Keywords:

Mixed method, quantitative approach,
qualitative approach, new paradigm in
research design

Copyright © 2017 PENERBIT AKADEMIABARU - All rights reserved

1. Introduction

Since many years (or since the early 1900s), the research communities in the world have tried to define the term mixed method. However, we have never realized how important it in our life. Especially when it comes to the reliability and validity discussion in which Cook and Campbell [1] stated that within the so-called quantitative tradition, quality standards have been defined by using the concept of reliability and validity. Cook and Campbell [1] also recited that this concept is an accumulative process with four steps. The initial steps were to assess whether a relationship exists between two variables and to determine if this relationship is causal. The third examines if the theoretical model is well depicted by the means through which it was operationalized. Finally, external validity examines if, and to what extent, findings can be generalized to other entities.

* Corresponding author.

E-mail address: [Romzi Ationg \(mratiiong@ums.edu.my\)](mailto:mratiiong@ums.edu.my)

The term namely reliability and validity have been very influential in quantitative research tradition, wherein a solid approach is to assess the quality of interpretative inquiry is the trustworthiness criteria [2, 3]. Therefore, the research community keeps questioning and makes some arguments on the validity and reliability of the research. It seems that there is no solid validity on each research done by using only one method (quantitative or qualitative). The critiques specifically go to the classical approach of validity. This critiques also of course goes to the possible problem in presenting the validity and reliability in qualitative research, and the irrelevance to do research by applying only single method (quantitative versus qualitative).

Moreover, the single method namely quantitative and qualitative would not be as compatible as purists from both sides have argued. Since that, research community have been tried to put these research method (quantitative and qualitative) altogether in one research in order to minimize the possible messes of the questionable reliability and validity. More than that, studies using mixed-method have shown that integration of these traditions within the same study can be seen as complementary to each other [4]. From these perspectives, arguments and discussions on what is the real definition of the term mixed-method taken place. Thus, there is of course the definition of this term (mixed method) still can be scrutinizes.

Besides, this article would not present a deep discussion on the strength and weaknesses of doing research using mixed method design. Our intention of producing this article is to highlight the traditional definition and the suggestion definition of the term mixed method. It will be specifically discussed in the next sub-topic. So, to personalizing the article hands-on knowledge and new experience, let us discusses the newly face or the new definition of the term mixed-method itself.

2. The Traditional Definition of Quantitative, Qualitative and Mixed Method

It is common for a researcher to know and to be well versed with research design. Traditionally there are three paradigmatic of research in the humanities sciences which are qualitative, quantitative and mixed method. The origin of the qualitative was derived from Latin, *qualitas* which in turn refers to 'what sort of type' or 'types of...'. It also means a measurable quality that can be measured or valued.

Specifically, a qualitative method is a method of inquiry appropriated in many different academic disciplines. The qualitative researchers aim to gather an in-depth understanding of the relevance aspects such as human activities and what are the possible reasons that govern them. It is a refereed scientific research in collecting library data such as data from books, manuscripts, graphs, interviews, pictures, fieldworks, interpretations of the specific aspects, searching for understanding on certain views e.g. as human acts in the form of practical, belief as well as ethics and value. In simple terms qualitative means a non-numerical data collection or explanation based on the attributes of the graph or source of data [5].

Qualitative method is useful for exploring and understanding complicated matters [6] as it investigates the *why* and *how* of certain events happens and not only about *what*, *where*, and *when*. Even though this method needs only a smaller size of sample but focuses on its need rather than a large sample size. It would produce information only on the particular cases studied, and any more general conclusions are only hypotheses.

All the findings will be written by the qualitative researcher in his scientific writing which is focusing on logical justification on every lines of his writing. In every single line the researcher needs to show the reliability and validity of the data. In this sense reliability refers to the measured data which was indicates the consistency or the changes taken place are not significant. For instance, the study on characteristics of marriage among Rungus couples such as 'berian' (gifts), 'pakaian' (costums) and 'warna-warna' (utilised colour) does not have differentiation or insignificant

differentiation among Rungus community in Kudat, (Malaysia). The comparison of these marriage characteristics to the community of Murut in Tenom (Malaysia) it would reveal the significant differences. So, these data cannot be reported because the reliability does not suit with the indicator of the study, that was the Rungus community.

Thus, the qualitative approaches are including ethnography, critical social research, ethical inquiry, foundational research, historical research, grounded theory, phenomenology and philosophical research. Qualitative data would be analyzed using interpretive technique, coding, recursive abstraction, and mechanical techniques.

However, quantitative methods are the research technique which is normally used to gather quantitative data as well as information dealing with numbers and anything that is measurable quantitatively. This method consists of numerical factors such as percentage, tables and graphs. The quantitative method refers to the term quantitative which was derived from Latin, *quantitas* that means numbers. The quantitative researchers generally using scientific methods such as the generation of models, theories and hypotheses, development of instruments and methods for measurement, experimental control and manipulation of variables, collection of empirical data, modeling and analysis of data, and evaluation of results that would really contrasted with qualitative methods.

Quantitative research using statistical methods starts with the collection of data. The data gathered using this method requires verification, validation and recording before the analysis can take place by using Statistical Package for the Social Scientists (SPSS), STATA, Matlab, Minitab etc.

In this research method, causal relationships are studied by manipulating the specific factors thought to influence the phenomena of interest while controlling other variables relevant to the experimental outcomes. The objective of quantitative research is to develop and employ mathematical models and theories pertaining to the phenomena and the process of measurement is central to quantitative research because it provides the fundamental connection between empirical observation and mathematical expression of quantitative relationships.

Reliability and validity of the gathered data of this method would be presented in a numerical manner [7]. It can be obtained before the researcher does the actual data collection. This process is referred as the pre test and the reliability shown using Cronbach's Alpha value. The validity would be presented using face validity and content validity that can be tested during pre test and/or post test.

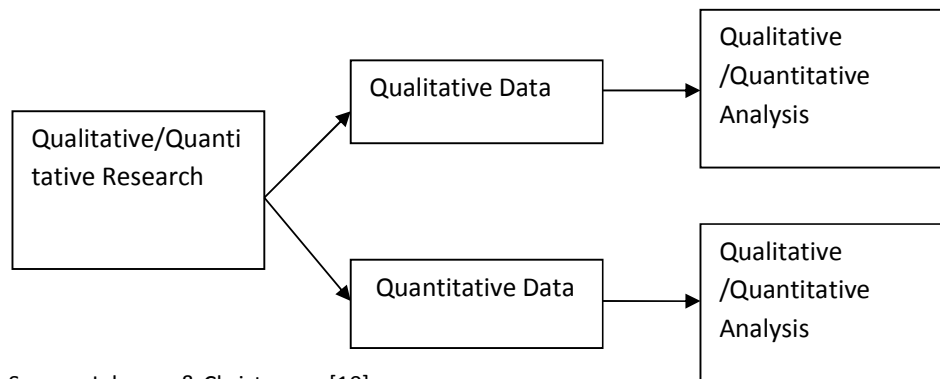
A mixed method design posited a different technique as compared to the qualitative and quantitative design. It is a long term research that applies different methods and approaches consecutively. Traditionally, mixed method research is working with different types of data and sometimes would use different investigators or even the different research teams that working in a very different research paradigms [8-12].

Bryman [13] stated that based on this reason, research community often defined the term mixed method as a multi-strategy research which using various/many type of research strategies. It would be as complex as compared to the other research method and each researcher need to be more passionate and focused.

There are two main types of mixed method namely mixed method and mixed model research [10]. The mixed method is a research that uses quantitative data for one stage of the research and qualitative data for a second stage of the research. In this case, research can be "fully mixed" research "partially mixed" research, and monomethod research.

According to Johnson and Christensen [10] mixed model design is a research that uses both qualitative and quantitative data in one or two stages of the research process. One of the advantages of using mixed method in research is the strength of research; the use of multiple methods is a research helps to research process or problem from all sides, and usage of a different approaches

helps to focus on a single process and confirm the data accuracy. Based on these advantages, this research design does not miss any available due to a mixed research compliments a result from one type of research with another one. There are two subtypes of mixed model that are within-stage and across-stage model research. In within-stage mixed model research, quantitative and qualitative approaches are mixed within one or more of the stages of research. However, in across-stage mixed method research, qualitative and quantitative approaches are mixed across at least two of the stages of research as shown in Figure 1 as below.



Source: Johnson & Christensen [10]

Fig. 1. Across-stage mixed method

A mixed method design is desirable and feasible because it gives a more complete view, and because the requirement during the different phases of the intervention make very specific demands on a general methodology. While it is demanding, it is more effective to choose the right tool for the job at hand [14].

However, there have been many critics according to the implementation or the use of mixed method especially from the post-modernist (peoples who defined a specific phenomenon based on the realistic assumption), who stated that the quantitative and qualitative research paradigm should not be mixed and it is wrong to do so. These critics therefore have made this research paradigm getting more popular. Among the critics stated that many paradigms are at odds with each other even if once the understanding of the difference is present, it can be an advantage to see many sides, and possible solutions may present themselves; cultural issues affect world views and analyzability in which the knowledge of a new paradigm is not enough to overcome potential biases; it must be learned through practice and experience; and the people have cognitive abilities that predispose them to particular paradigms. This is the main reason why such realistic and/or relevance definition of this term needed. Hence, we do hope that there will be the best definition soon that geared the research community in utilizing this research design with no doubt.

3. New Face of Mixed Method: A Suggestion

It is appropriate for us to participating in the effort to improve a concept of mixed-method. Improvement is necessary because there are some concepts; especially the concept of 'mixed method' may be still too young. Leech and Onwugbuzie [15] stated that the term mixed-method is still in its adolescent and still relatively unknown to many researcher. This means that the concept of mixed method itself must be introduced and at the same time have the appropriate maturity. The process to finalize the concept of mixed method can be done by the assistance of various references, such as books, (e.g. Creswell and Plano [8]; Greene [9]; Johnson and Christensen [10]) methodological

articles, (e.g. Johnson and Onwugbuze [11]) and journal editorials, (e.g. Tashakkori and Creswell [12]; Hunter and Erin [16]).

Based on the fact we took the role to try to define this concept systematically according to the local mould (the Persatuan Penyelidik Kaedah Campuran, UMS perspective / UMAR). The proposed new definition is not aimed to ending the term of the existing history (definition), but just to adapt it to the current situation in Malaysia. It was never crossed our minds to make a collapse in the field of research that uses this method. The main reason to do so is because of the situation in this country that still sees this as a method as well as new perspectives in research activities. So we are finally called to try to do something that is certainly not conclusive.

Before that, we would like to once again see the traditional definition of 'mixed method' before we suggest the definition to enable the boy early on disorder that most researchers in this country suffer. The definition of 'mixed method' that is currently highlighted is the combination of qualitative and quantitative methods. Mixed method is also centred on the use of combined methods of qualitative / quantitative and qualitative / quantitative. Therefore, we believe that fundamental research of mixed method design that being used only affect a paradigm only even though the term mixed method is supposed to be comprehensive and not only able to answer only one aspect of the question.

In our view it is not sufficient to conclude that mixed method is measured as a combination of qualitative and quantitative, or a combination of qualitative / quantitative and qualitative / quantitative. The combination of two methods is very difficult to actually happen if we just have the necessary data but has no minimum understanding or skill in respect of area being studied. Minimum understanding in this aspect refers to the level of expertise in which the researcher must have high level of expertise. Based on this definition of minimum understanding the researchers using quantitative methods (data collection using questionnaires) and qualitative (data collection using interviews) are necessarily only know of a case related to the field being studied in a very limited rate. But then the researcher can only describe related phenomenon based on the data collected and would not be able to give clear answers to questions related to the areas studied.

This condition shall not be considered as good as the results still have significant defects. A good research that uses mixed-method design should know all things, whether in theory or in practice on matters relating to the field of study. If someone is knows only one corner or portion of the field may be regarded as improper or questionable way of collecting the data of a certain research because there is actually the inability to provide a comprehensive answer.

In the study of religion a person can be considered as not answering the question of the study when the researcher was only able to settle in a corner of the study and when asked about other aspects related to the topics studied the researchers were not able to give answers. To study the life of a Muslim scholar a researcher needs to understand their background and knowledge while review the book and the language will not be able to generate good results.

To become effective researchers in the field of religion especially Islamic studies, a researcher at least know the Arabic language, can read the Al-Quran and Hadith, and understand the discipline of Islam. While the equipment used for the study is considered as complementary and equipment should be backed by a minimum of skill or understanding of an aspect being investigated. Meaning of the concept of 'minimum understanding' is that a person is required to have knowledge, information and expertise that would not only able to collect the relevant data without actually able to explaining the real situation of the field being studied.

This means mixed method should not only be measured based on the use of tools or methods, but should be based on adequate understanding. The important elements in the concept of *minimum understanding or minimum requirement* that is trying to put forward is refers to clear understanding

and the researcher ability to describe comprehensively the topic under studied (minimum understanding/minimum requirement = the ability of a person to specifically describe and measure any topic associated with the field of study he or she is undertaking. The main criteria to define whether some is able to specifically describe and measure the topic must be based on his or her high level of knowledge, skill and interpretation on these specific topics). Improper method in dealing with minimum understanding will defect the research that is considered as a mixed method research if not handled properly. Incestuous statements asserting that it is very difficult to be an expert or have a minimum knowledge (minimum requirement) of two or more fields were not really base on a strong argumentation and seems unreasonable because the human brain is actually better than a computer program in the context expertise. For example, a general in a military force is an expert in weaponry and war strategy. In reality, a general is also can be a good father and a good husband too. These two elements and characteristic are embodied in a person. It is not only an embodiment, but how a person mastered in two different expertises. In comparison, to the mixed method, a researcher who used the mixed method must at least expert in two elements in his research. Thus if he is an expert in using ethnography approaches, he is also needed to be expert in using observation approaches or at least must be expert in one of the two method and having minimum requirement (knowledge and expertise) in another method to carried out his research effectively.

It means that the researcher using mixed method approach should be an expert on some aspects, areas, skills, knowledge or use of equipment first. If they do not have what is known as minimum understanding then it is appropriate that the study was done only regarded as qualitative or quantitative research alone. We do like to put forward some additional arguments on the term mixed method given by Green and Caracelli [17] that is the using mixed method considered as complimentary. If we only use the term complementary then it would be given the term mixed method instable or even open to be more criticize. The word 'complementary' should be taken aside and replaces with the term 'minimum understanding' which is equal to minimum expertise.

Moreover, the existing definition of mixed method is only discussed the merger of different data and data analysis techniques. Although, the term mixed method can be refined further by adding a number of aspects such as *tools, expertise and areas of study* as well. In terms of tool, defining the concept of mixed method at the moment should take into account its importance as an aspect that needed to ensure the success of a research. Research tools such as questionnaire that is an important element of quantitative research should be combined with qualitative research tools such as interviews and focus group discussions. In this case the data obtained using the questionnaire, eventually will be analyzed using SPSS. While the data collected using interviews or focus group discussions will be analyzed using the Atlas.ti, Nvivo, etc.

If a study did not incorporate at least two or three different types of tool that research should not be considered as using mixed method approach as the ability of researchers using two different devices at the same time are still in doubt. For example, a researcher in the field of human study that is conducting a research on youth in Islamic perspective need to combine the expertise in religion study (Islamic study) and adolescent psychological that well proven to make the study really mixed method. At the same time various aspects of the merger must also be done as the merger of expertise, field, tools, data and methods of data analysis.

As shown in Figure 2 one that uses mixed method should be experts in the field of religious studies (such as Islamic jurisprudence) and psychology (such as adolescence psychology). He/she also needs to incorporate tools such as *Al-Quran, As-Sunnah*, and observation and questionnaires. Besides that, is it suggested that the data should be merged that would be later analysed using different techniques.

Table 1
 Defining mixed method based on the expertise and field

Research in Humanity	Mixed Method (MM)		Expertise Level
Field of Study	Islamic Studies (MM1)	Psychology (MM2)	Well verse
Expertise	Islamic Jurisprudence (well proven)	Adolescence Psychology (well proven)	Well verse
Method	Qualitative/Quantitative	Qualitative/Quantitative	Well verse
Tools	The science of Al-Quran, the science of As-Sunnah, etc	Observation, Questionnaires, etc	Well verse
Data	Prime data	Prime data	Well verse
Data Analysis	Interpretation, Nvivo, religious interpretation, etc	SPSS, Nvivo, interpretation, etc	Well verse

Moreover, the definition of mixed method should also take into account the concept of combination or merging the expertise. The meaning of expertise in this case is the knowledge or skill of an expert. Expertise is not only measured based on the relatively obscure, but must be measured in a more systematic, that is able to answer all questions satisfactorily as long as it relates to matters under review. Someone is not answering a question if he can only say that "aspect has not been studied and will be reviewed in the future "when it is an aspect that should be known before the other case studied. The researcher is not only required to talk about the field under study but could not able to explain it very well. The researcher must be completely well verse in the fields that he is intent to study in order to refers the research as mixed method research. This can be explaining through the following formula:

$$MM = [\sum MM1 + \sum MM2] \times \text{Expertise Level (Well Verse)}$$

MM = Mixed method
 MM1 = Field of Study 1
 MM2 = Field of Study 2

According to the given formula, each mixed method research must possess at least two types of field of study (MM1, MM2). The element of each one of them must including types of expertise, methods being used, tools, type of the data and the data analysis technique. In all these fields of study and its elements, the researcher must be well versed to make the research a success and being considered as mixed method. If the researcher is not really expert or well verse in these fields of study and its elements then the research must be considered as non mixed method research.

Another example, in the study on reducing the dumping of the new born in Malaysia from the perspective of Islam, the researchers need to be well verse in religious studies using the element on study of religions such as knowing how to read Arabic script, know the Koran and skilled interpretation of the verses of al-Quran if he wants to study the effects of religious factors on the reduction of infant dumping problem among teenagers. The researchers also should be aware of and skilled in the field of psychology to answered the entire relevance question. Moreover, in this case the researcher must equip themselves with two types of expertise such as the Islamic study and psychology.

Thus, the definition of mixed method should also take into account the combination of knowledge/field (see Figure 3) Combination of two different fields of knowledge should be seen as mixed method for a study that usually does not limit the ability to answer a related question. As long as it is related to it then they need to be answered. Thus, if the answer to that question can only be

obtained from two different areas it will be difficult to define a research approach used in this study. This confusion would be reduced by saying that mixed method also refer to the combination of two different fields of knowledge when doing the research.

The figure suggests that mixed method resulting from not only the element of combination of data and combination of data analysis techniques. But the definition of mixed method should also consist of combination of tools, combination of expertise and combination of field. If all these elements not in the research then it should not be considered as the study using mixed method approach.

This new idea is not against the merger, but a combination of qualitative and quantitative should be reviewed as a matter or should be extensive and result in better understanding. Merging the method of quantitative / qualitative and quantitative / qualitative can still be seen as an important basis for the introduction of the mixed method approach. However, there are the important aspects that must be taken into consideration to make the terms relevance (see Table 2). The element of 'minimum understanding' which refers to the level of expertise belong to the researcher is also needed to be taken into account in order to defined either the research is mixed method research or otherwise.

In short, integration of all these new aspects in defining the mixed method is described in Figure 3 as below.

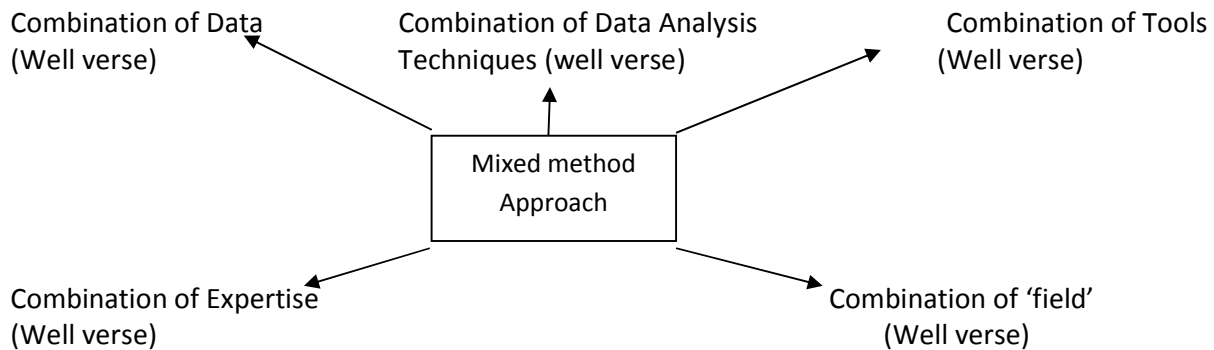


Fig. 3. New faces of mixed method: A Malaysian perspective

Table 2

New element of mixed method: A Malaysian perspectives

Definition of Mixed method	Basic Element	Additional Element/New Face of Mixed method
Traditional Mixed method Definition	Combination of methods (qualitative + quantitative; qualitative/quantitative + qualitative/quantitative)	-nil-
Mixed method: UMAR Perspective	Combination of methods (qualitative + quantitative; qualitative/quantitative + qualitative/quantitative)	Well verse or Minimum Understanding in: 1. Topic under investigates; 2. Combination of tools; 3. Combination of expertise; 4. Combination of field of study

This newly face of mixed method can also be presented as in diagram as shown as in Figure 5. As according to the diagram (see Figure 4) mixed method is a merger between many elements. All these elements then must be followed by the level of expertise belong to the researcher.

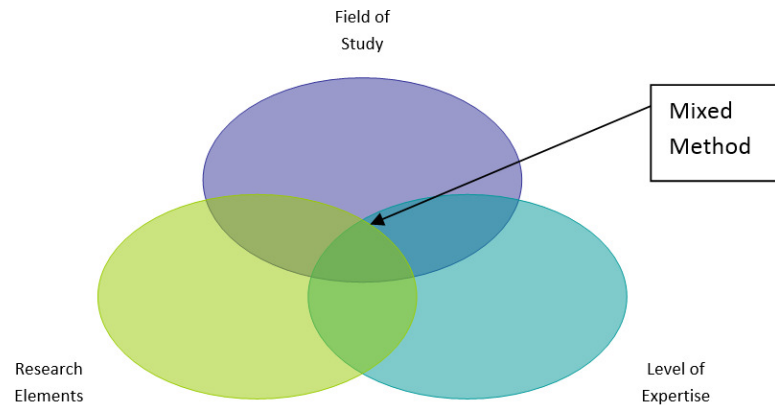


Fig. 5. New face of mixed method research: A Malaysian perspective

In other words, the newly proposed definition of mixed method consists of original element with the addition of new element known as minimum understanding. This element would be a value added to the merger of at least two type of field of study and its elements (tools; expertise; type of the data; data analysis; and method). It should be also seen as an act of strengthening the original idea.

4. Why Mixed Method

Using mixed-method approach especially by using this suggested mixed method definition may result of combined effects of factors. It would not only overcome the present problems in doing research using mixed-method but would also clarify the term. Sometimes, by using the present definition of mixed-method the researcher would not confidence in their choice. It might be the products of having traditional definition of mixed-method that only mixing up qualitative and quantitative. The reason is that generally when doing research using quantitative research it perhaps difficult to linked the numerical data with the possible answer as many can give their argument on the efficacy of the numerical data in answering certain question. Thus, adding qualitative approach in this particular research is a good strategy to overcoming some of those problems. That is why many researchers are increasingly using mixed method in their research activities. Green *et al.* [17,18] therefore stated that there are five major ones that enhance the number of researcher intention to use the mixed method approaches. 1) Triangulation – Mixed-method allowed the researcher to tests the consistency of findings obtained through different instruments. In the case study, triangulation will increase chances to control, or at least assess, some of the threats or multiple causes influencing our results; 2) Complementarities - Using mixed-method would clarify and illustrates results from one method with the use of another method. In our case, in-class observation will add information about the learning process and will qualify the scores and statistics; 3) Development – There are the possible that each results from one method shape subsequent methods or steps in the research process. In our case, partial results from the preprogram measures might suggest that other assessments should be incorporated; 4) Initiation - It would stimulate new research questions or challenges results obtained through one method. In our case, in-depth interviews with teachers and principals will provide new insights on how the program has been perceived and valued across sites

and; 5) Expansion – Using mixed-method approaches also can provides richness and detail to the study exploring specific features of each method. In our case, integration of procedures mentioned above will expand the breadth of the study and likely enlighten the more general debate on social change, social justice, and equity in Brazil and the role of the public and private sector in this process.

All these five elements that considered as the strength of mixed method above is actually the result of the definition do not see the broader discipline. Mixed method therefore should be suitable for the study of various areas of knowledge. If a researcher is using only single approach it can be concluded as still less accurate. The five fundamental uses of mixed method further strengthens by the introduction or improvement of the concept of mixed-method according to UMAR perspectives which elements of understanding and a more comprehensive knowledge exaggerated. Adding the concept of *minimum understanding*, *combination of tools*, *combination of expertise*, and *combination of field* is of course necessary to bring a new dimension in research using the traditional mixed method approach that is “as long as there is sufficient data for a study” set aside from time to time. We do not want to hold on to practices that are not comprehensive.

It would also minimize the debate among the researcher on the act of defining the term mixed method. Moreover, it would make the research community getting more understood of what are the methods being used by them in carried out their task of answering the research question.

In accordance, it is hoped that the introduction of the concept of 'minimum understanding/knowledge', combination of tools, combination of expertise, and combination of field in mixed-method approach is able to enrich the relevance field of study that use mixed-method approach. Without the element of a minimum understanding (high level of expertise or well verse), it is believed that a study is still not properly called a mixed method study. That is the only way which will enable a successful mixed method research.

5. Conclusion

Based on the discussion presented in this article, it can be concluded that the term mixed method must be redefined. The traditional definition that is mixing the qualitative method and quantitative method has to be improved or would be taken aside. The definition of this method does concerning on the qualitative and quantitative but may be a mix of quantitative methods or a mix of qualitative methods with the newly element that is requiring minimum understanding/knowledge. When adopting a new mixed method strategy the researcher must constitute a strategy in its own right or it may be subsumed within another research strategy such as qualitative (ethnography) + qualitative (historical research) and quantitative (survey) + quantitative (experiment). However in order to make it much more relevant, the researcher must put altogether the elements of minimum understanding/knowledge, combination of tools, combination of expertise and combination of field when carrying out their research activities.

The definition which stated that mixed method design involves research that uses mixed data (numbers and text) and additional means (statistics and text analysis) can be defined as the traditional definition of the term mixed method. A newly definition of mixed method uses not only concerning on the qualitative and quantitative or even qualitative + qualitative and quantitative + quantitative but the minimum knowledge/understanding, combination of tools, combination of expertise and combination of field must take place as well.

Hence, we must remember that the most important part in doing research is that the process would meet the aims and it would not only depend largely on what are the method being mixed. Perhaps, many would question this unique definition. However, we do believe that the more unique

and/or complex the process, the aims and the design, than the ones utilized the more it will help to answer the research question.

References

- [1] Cook, Thomas D., and Donald Thomas Campbell. *Quasi-experimentation: Design and analysis for field settings*. Rand McNally, 1979.
- [2] Bryman, Alan. *Social research methods*. Oxford university press, 2015.
- [3] E.G. Guba, Y.S. Lincoln, Judging the quality of fourth generation evaluation. In E.G. Guba, Y. Lincoln, Fourth generation evaluation, Sage, 1989 (28-51).
- [4] V.J. Caracelli, J.C. Greene, Crafting mixed method evaluation design. In J.C. Greene, V.J. Caracelli (eds.), *Advances in mixed method evaluation: The challenges and benefits of integrating diverse paradigms*, Jossey-Bass, 1997 (19-32).
- [5] Hennink, Monique, Inge Hutter, and Ajay Bailey. *Qualitative research methods*. Sage, 2010.
- [6] Rashidi, M. Nor, R. Ara Begum, M. Mokhtar, and J. J. Pereira. "The Conduct of Structured Interviews as Research Implementation Method." *Journal of Advanced Research Design* 1, no. 1 (2014): 28-34.
- [7] Kuhn, Thomas S. "The function of measurement in modern physical science." *Isis* 52, no. 2 (1961): 161-193.
- [8] Creswell, John W., and Vicki L. Plano Clark. "Designing and conducting mixed methods research." (2007).
- [9] Greene, Jennifer C. *Mixed methods in social inquiry*. Vol. 9. John Wiley & Sons, 2007.
- [10] Johnson, Burke, and Larry Christensen. *Educational research: Quantitative, qualitative, and mixed approaches*. Sage, 2008.
- [11] Johnson, R. Burke, and Anthony J. Onwuegbuzie. "Mixed methods research: A research paradigm whose time has come." *Educational researcher* 33, no. 7 (2004): 14-26.
- [12] Tashakkori, Abbas, and John W. Creswell. "The new era of mixed methods." (2007): 3-7.
- [13] Bryman, Alan. *Social research methods*. Oxford university press, 2015.
- [14] Creswell, John W. *Educational research: Planning, conducting, and evaluating quantitative*. Upper Saddle River, NJ: Prentice Hall, 2002.
- [15] Leech, Nancy L., and Anthony J. Onwuegbuzie. "A typology of mixed methods research designs." *Quality & quantity* 43, no. 2 (2009): 265-275.
- [16] Hunter, Laura, and Erin Leahey. "Collaborative research in sociology: Trends and contributing factors." *The American Sociologist* 39, no. 4 (2008): 290-306.
- [17] Greene, Jennifer C., Valerie J. Caracelli, and Wendy F. Graham. "Toward a conceptual framework for mixed-method evaluation designs." *Educational evaluation and policy analysis* 11, no. 3 (1989): 255-274.
- [18] Greene, Jennifer C., and Valerie J. Caracelli. "Defining and describing the paradigm issue in mixed-method evaluation." *New directions for evaluation* 1997, no. 74 (1997): 5-17.